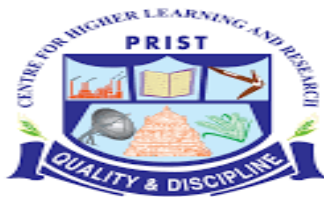


ACADEMIC YEAR
2022 – 2023



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INDEX

ACADEMIC YEAR – 2022-2023

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SCHOOL OF ENGINEERING AND TECHNOLOGY
DEPARTMENT OF MECHANICAL ENGINEERING

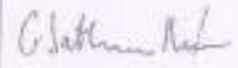

Minutes of the meeting of the Board of Studies (BoS)*

Date: 09.05.2022
Venue: seminar hall
Time: 10.00am





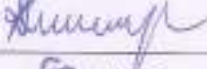

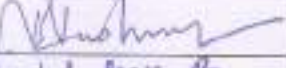
Members present:

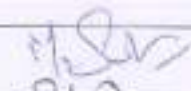


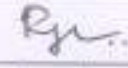

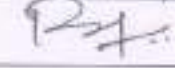

Chair: **Dr S DHANUSHKODI**
PRIST

External Members

S.No.	Name/Degree/Designation	Institute/Organization/ Full address	Online/ Physical	Signature (scan, if online)
1	Dr. C.SATHIYA NARAYANAN	Associate Professor & HEAD, Production Engg NIT, TRICHY	Online	
2	Er.S.MARIMUTHU	Deputy Manger, Stock verification Wing, BHEL Trichy	Online	



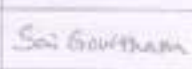
Internal Members

S.No.	Name/Degree/Designation	Department	Online/ Physical	Signature (scan, if online)
1.	Dr.T.V.CHRISTY Professor	Mechanical Engineering	Physical	Granted leave of absence *
2.	Dr.S.DHANUSKODI Professor	Mechanical Engineering	Physical	
3.	M.ABDUL GHANI KHAN Associate Professor	Mechanical Engineering	Physical	
4.	Dr.V.YALINI Associate Professor	Mechanical Engineering	Physical	
5.	Dr.S.P.KALAISELVAN Associate Professor	Mechanical Engineering	Physical	Granted leave of absence *
6.	Dr.S.V.SRIDHAR Associate Professor	Mechanical Engineering	Physical	
7.	R.TAMIZH SELVAN Assistant Professor	Mechanical Engineering	Physical	
8.	P.VIJAYAKUMAR Assistant Professor	Mechanical Engineering	Physical	
9.	R.BASKARAN Assistant Professor	Mechanical Engineering	Physical	
10.	K.PURUSHOTHAMAN Assistant Professor	Mechanical Engineering	Physical	Granted leave of absence *

11.	M.SUDHAHAR Assistant Professor	Mechanical Engineering	Physical	
12.	P.SARATH KUMAR Assistant Professor	Mechanical Engineering	Physical	
13.	N.SIVAHARINATHAN Assistant Professor	Mechanical Engineering	Physical	
14.	J. RAJESH Assistant Professor	Mechanical Engineering	Physical	
15.	G.ARUNKUMAR Assistant Professor	Mechanical Engineering	Physical	
16.	G.BRITHIVIRAJ Assistant Professor	Mechanical Engineering	Physical	
17.	J.SELVAMANI Assistant Professor	Mechanical Engineering	Physical	

* - Oral Inputs received

Invited Participants

S.No.	Name/Degree/Designation	Department/Class Institute/Organization/Address	Online/ Physical	Signature (scan, if online)
1	Dr.Latha Ph.D/Professor	CSE/PRIST	Physical	
2	Mr VIVEK, Managing Director	Advisewise Educational Consultancy, Thanjavur	Physical	
3	Mr. SaiGowtham	Student	Physical	

Agenda:

1. To Confirm the previous Meeting Minutes
2. To discuss the action taken on the previous Meeting Minutes
3. To scrutinize the stakeholder feed backs on B.Tech – Mechanical Engineering (FT/PT).
4. To scrutinize the stakeholder feed backs on M.Tech-Manufacturing Technology (FT/PT).
5. To recommend the panel of Examiners for B.Tech – Mechanical Engineering (FT/PT).
6. To recommend the panel of Examiners for M.Tech- Manufacturing Technology (FT/PT).
7. To discuss about B.Tech - Mechanical Engineering (FT) syllabus revision of higher semesters with Subject to the prevailing condition.
8. To accommodate the suggestions revealed by stakeholders and to incorporate them as revised syllabus for B.Tech - Mechanical Engineering (PT) & M.Tech- Manufacturing Technology (FT/PT)
9. To discuss about addition of new value added courses.

MINUTES OF THE MEETING

At the outset, the Chairman BOS welcomed the members for attending the meeting of the Board of Studies. In his introductory remarks, he described the agenda items.

Agendum 1:

Discussion: To confirm the previous BOS Meeting Minutes and to discuss the action taken on the previous BoS Meeting Minutes.

Resolution: The chairman confirmed the previous meeting minutes of BoS and discussed the action taken on the previous BOS Meeting Minutes.

Agendum 2:

Discussion: To scrutinize the abstract of stakeholders feedback on existing curriculum and syllabi for B.TECH-MECH (Full Time/Part Time) and M.TECH- Manufacturing Tech (Full Time/Part Time).

Resolution: The members of the Board thoroughly scrutinized the existing curriculum and syllabi and the abstract of stakeholders feedback on B.TECH-MECH (Full Time/Part Time) and M.TECH- Manufacturing Tech (Full Time/Part Time) and resolved to revise the curriculum in the subsequent syllabus revision.

Agendum 3:

Discussion: To discuss about B.Tech(FT) syllabus revision of higher semesters subject to the prevailing condition.

Resolution: Subject to the prevailing condition, syllabus revision is to be carried out for the higher semesters of B.Tech(FT).

Agendum 4:

Discussion: To accommodate the suggestions revealed by stakeholders and to incorporate them as revised syllabus for B.Tech(PT) & M.Tech- Manufacturing Tech (FT/PT).

Resolution: The members of the board have unanimously recommended to introduce the new courses with the revised curriculum and syllabi for B.TECH-MECH(PT) & M.TECH - Manufacturing Tech (FT/PT).

Agendum 5:

Discussion: To recommend the panel of Examiners for B.Tech(FT/PT) and for M.Tech- Manufacturing Tech (FT/PT).

Resolution: The members of the board also scrutinized and updated the panel of examiners and recommended the panel of examiners for the B.TECH -MECH (FT/PT) & M.TECH - Manufacturing Tech (FT/PT), and submitted the same for the Academic Council for its approval.

Agendum 6:
Discussion: To recommend the addition of new value added courses.
Resolution: The members of the board analyzed the feedback from various stakeholders and suggested the following value added courses. <ul style="list-style-type: none"> 1) Certificate Course On Metrology And Quality Control 2) Certificate Course On Artificial Neural Networks 3) Certificate Course On Advanced Automotive Systems 4) Certificate Course On Electrical Automotives 5) Certificate Course On Wind Energy

The meeting was concluded with thanks from the Chairman.

Signature: 

Chair/HoD: HoD

Dept.: Mechanical Engineering

Name: Dr. S. Dhanuskali

Date: 9.5.2022

Signature: 

Dean: E&T.

School:

Name: R-TAMIZHSELVAN

Date: 09.05.2022

Enc:

1. Annexure – I: B.Tech (PT) – Mechanical Engineering
2. Annexure – II: M.Tech (FT / PT) – Manufacturing Technology


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ANNEXURE-I:

B.TECH (Mechanical Engineering) – Part Time

- ITEM 1:** A new course is introduced as 22154C15P-Manufacturing Technology –I instead of 19154C15P Foundry and Welding Technology to get the Knowledge of industries to educating the employees and enforcing various labor legislation in order to eliminate the prevailing unsafe condition and correct the usage actions.
- ITEM 2:** A new course is introduced as 22154C22P-Manufacturing Technology –II instead of 19154C22P Machine tool technology to get the Knowledge in industries for educating the employees
- ITEM 3:** A new course is introduced as 22154C33P-Computer Aided design and manufacturing in stead of 19154C33P Production Planning and Control to get the Knowledge and to identify the new methodologies
- ITEM 4:** A new course is introduced as 22154C41P-Professional Ethics instead of 19154C33P Power plant engg to get the Knowledge with human ethics
- ITEM 5:** A new course is introduced as 22154C53P-Safety in process industries instead of 19154C53P Automobile Engg to get the Knowledge in industrial Safety measures for educating the employees
- ITEM 6:** A new course is introduced as 22154C63P-Maintainence Engineering instead of 19154C63P Computer integrated manufacturing to get the Knowledge industries for educating the employees action
- ITEM 7:** A new course is introduced as 22154C73P-Advanced IC Engines instead of 19154C73P Applied hydraulics and pneumatic to get the Knowledge in automobile industries for educating the employees
- ITEM 8:** A 22154E44P Fundamental of Nano science is introduced in 4th semester as elective instead of the course 19154E44P-Non Destructive testing to understand about NANO Technology.
- ITEM 9:** A 22154E54BP Human Rights is introduced in 5th semester as elective instead of the course 19154E54BP-Composite Materials to understand about Human Rights Acts
- ITEM 10:** A 22154E64CP Engineering Economics is introduced in 6th semester as elective instead of the course 19154E64CP-Intellectual Property Rights to understand about Economics aspects in engineering
- ITEM 11:** 22154E74DP Disaster Management is introduced in 7th semester as elective instead of the course 19154E74DP-Industrial Engineering to understand about Calamity changes in environment
- ITEM 12:** 22154E44BP Welding Trechnology is introduced in 4th semester as elective instead of the course 19154E44BP-Refrigeration and Airconditioning to understand about advanced joiaing process.
- ITEM 13:** 22154E54DP Marketing Management is introduced in 5th semester as elective instead of the course

19154E54DP-Design Of Jigs, Fixtures and Press Tools to understand about strategy in bussiness industries

ITEM 14: 22154E64BP Energy conservation and management is introduced in 6th semester as elective instead of the course 19154E64BP-Nuclear Engineering to gain knowledge in energy conservations in engineering

ITEM 15: 22154E74AP Additive manufacturing is introduced in 7th semester as elective instead of the course 19154E74AP-Quality control and reliability engineering to understand about 3D printing and advanced knowledge in recent trends

ITEM 16: 22154E74BP Computational fluid dynamics is introduced in 7th semester as elective instead of the course 19154E74BP-vibration and noise control to understand about advanced fluid properties in space engineering technology

Inclusion of Courses in B.Tech – Mechanical Engineering (PT)-(R-2022)

1. Manufacturing Technology –I
2. Manufacturing Technology –II
3. Computer Aided design and manufacturing
4. Professional Ethics
5. Safety in process industries
6. Maintainence Engineering
7. Advanced IC Engines
8. Fundamental of Nano science
9. Human Rights
10. Engineering Economics
11. Disaster Management
12. Welding Trechnology
13. Marketing Management
14. Energy conservation and management
15. Additive manufacturing
16. Computational fluid dynamics

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DEPARTMENT OF
MECHANICAL ENGINEERING

PROGRAM HANDBOOK

B.Tech
MECHANICAL ENGINEERING
Part time
[Regulation 2022]

Semester – I

SL No	Subject Code	Subject Name	Periods Per Week			C
			L	T	P	
1	22148S11P	Transforms & Partial Differential Equations	3	1	0	4
2	22154C12P	Electrical drives and controls	3	0	0	3
3	22154C13P	Engineering Thermodynamics	3	1	0	4
4	22154C14P	Fluid Mechanics and Machinery	3	1	0	4
5	22154C15P	Manufacturing Technology - I	4	0	0	4
Total No of Credits						19

Semester – II

S. No	Subject Code	Subject Name	Periods Per Week			C
			L	T	P	
1	22148S21P	Numerical Methods	3	1	0	4
2	22154C22P	Manufacturing Technology - II	3	0	0	3
3	22154C23P	Thermal Engineering	3	1	0	4
4	22154C24P	Strength of Materials	3	1	0	4
5	22154C25P	Engineering Materials and Metallurgy	4	0	0	4
Total No of Credits						19

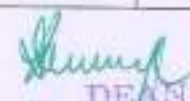
Semester – III

S. No	Subject Code	Subject Name	Periods Per Week			C
			L	T	P	
1	22148S31CP	Probability and Statistics	3	1	0	4
2	22154C32P	Kinematics of Machinery	3	1	0	4
3	22154C33P	Computer Aided Design and Manufacturing	4	0	0	4
4	22154C34P	Engineering Metrology and Measurements	4	0	0	4
5	22154L35P	Computer Aided Simulation and Analysis Laboratory	0	0	3	2
Total No of Credits						18


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Semester –IV

S. No	Subject Code	Subject Name	Periods Per Week			C
			L	T	P	
1	22154C41P	Professional Ethics	4	0	0	4
2	22154C42P	Dynamics of Machinery	3	1	0	4
3	22154C43P	Design of Machine Elements	3	1	0	4
4	22154E44-P	Elective -I	4	0	0	4
5	22154L45P	Dynamics Laboratory	0	0	3	2
Total No of Credits						18

Semester – V

S. No	Subject Code	Subject Name	Periods Per Week			C
			L	T	P	
1	22154C51P	Heat and Mass Transfer	3	1	0	4
2	22154C52P	Design of Transmission Systems	3	1	0	4
3	22154C53P	Safety in Process Industries	4	0	0	4
4	22154E54-P	Elective-II	4	0	0	4
5	22154L55P	Heat Transfer Laboratory	0	0	3	2
Total No of Credits						18

Semester –VI

S. No	Subject Code	Subject Name	Periods Per Week			C
			L	T	P	
1	22154C61P	Finite Elements Analysis	3	1	0	4
2	22154C62P	Mechatronics	4	0	0	4
3	22154C63P	Maintenance Engineering	4	0	0	4
4	22154E64-P	Elective-III	4	0	0	4
5	22154L65P	Mechatronics Laboratory	0	0	3	2
Total No of Credits						18

Semester – VII

S. No	Subject Code	Subject Name	Periods Per Week			C
			L	T	P	
1	22160S71P	Total Quality Management	3	0	0	3
2	22154C72P	Process Planning and Cost Estimation	3	1	0	4
3	22154C73P	Advanced I.C. Engines	3	0	0	4
4	22154E74-P	Elective-IV	3	0	0	3
5	22154P75P	Project Work	0	0	12	6
Total No of Credits						19

Total No of Credits from Semester I to VII – 130

LIST OF ELECTIVES

Elective I

Semester – IV

S. No	Subject Code	Subject Name	Periods Per Week			C
			L	T	P	
1	22154E44AP	Gas Dynamics and Jet Propulsion	4	0	0	4
2	22154E44BP	Welding Technology	4	0	0	4
3	22154E44CP	Fundamentals of Nanoscience	4	0	0	4
4	22154E44DP	Renewable Sources of Energy	4	0	0	4

Elective II

Semester – V

S. No	Subject Code	Subject Name	Periods Per Week			C
			L	T	P	
1	22154E54AP	Environmental Science and Engineering	4	0	0	4
2	22154E54BP	Human Rights	3	0	0	4
3	22154E54CP	Robotics	4	0	0	4
4	22154E54DP	Marketing Management	4	0	0	4

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Elective III
Semester – VI

S. No	Subject Code	Subject Name	Periods Per Week			C
			L	T	P	
1	22154E64AP	Principles of Management	4	0	0	4
2	22154E64BP	Energy Conservation and Management	4	0	0	4
3	22154E64CP	Engineering Economics	4	0	0	4
4	22148E64DP	Mathematics for Industrial Operations	4	0	0	4

Elective IV
Semester – VII

S. No	Subject Code	Subject Name	Periods Per Week			C
			L	T	P	
1	22154E74AP	Additive Manufacturing	3	0	0	3
2	22154E74BP	Computational Fluid Dynamics	3	0	0	3
3	22154E74CP	Unconventional Machining Process	3	0	0	3
4	22154E74DP	Disaster Management	3	0	0	3



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ANNEXURE-II:

M.TECH(Manufacturing Tech)-Full Time & Part Time

ITEM 1: A new course is introduced as 22254C14-Advanced casting & welding instead of 19254C14 Mechanical Metallurgy to get the Knowledge for industries and educating the employees

ITEM 2: A new course is introduced as 22254C21-Tooling for manufacturing instead of 19254C21 Production management to get the Knowledge for management activities in industries

ITEM 3: 22254E16B Quality and Reliability Engg is introduced in I semester as elective instead of the course 19254E16B-Financial management to understand and gain knowledge in quality control.

ITEM 4: 22254E25A Non Destructive testing and evaluation is introduced in II semester as elective instead of the course 19254E25A-Advanced Metrology and computer Aided Inspection to understand and gain knowledge in NDT

ITEM 5: 22254E32A Process planning and cost estimation is introduced in III semester as elective instead of the course 19254E32A-Manufacturing Systems and Simulation to understand and gain knowledge in process planning in organization.

ITEM 6 :22254E32C Research methodology is introduced in III semester as elective instead of the course 19254E32C Artificial intelligence and Neural network to understand and gain knowledge in research activities

ITEM 7 : A newcourse 22254E33C Internet of things for manufacturing is introduced in III semester as elective to understand and gain knowledge in IOT

ITEM 8 : A newcourse 22254E34C Additive manufacturing is introduced in III semester as elective to gain knowledge in 3D printing as emerging areas

ITEM 9 : 22254E34B Industrial safety is introduced in III semester as elective instead of the course 19254E34B Industrial Ergonomics to understand and gain knowledge in safety in Engineering industries.

Inclusion of Courses in M.Tech.(FT)-(R-2022)

1. Advanced casting & welding
2. Tooling for manufacturing
3. Quality and Reliability Engineering
4. Non Destructive testing
5. Process planning and cost estimation
6. Research methodology
7. Internet of things for manufacturing
8. Additive manufacturing
9. Industrial safe

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**DEPARTMENT OF
MECHANICAL ENGINEERING**

PROGRAMME HANDBOOK

M.Tech. – Manufacturing Technology

FULL TIME PROGRAMME

Regulation 2022

(For candidates admitted to M.Tech Manufacturing Technology Programme from June 2022 onwards)

COURSE STRUCTURE

Semester - 1

Course Code	Title of Paper	Hours / Per Week			
		L	T	P	C
22248S11	Advanced Engineering Mathematics	3	1	-	4
22254C12	Theory of Metal Cutting	4	-	-	4
22254C13	Advanced Manufacturing Processes	4	-	-	4
22254C14	Advances in Casting & Welding	4	-	-	4
22254C15	Automated Computer Integrated Manufacturing Systems	4	-	-	4
22254E16 (A To C)	Elective - I	3	-	-	3
22254L17	CAD/CAM Laboratory	-	-	3	3
TOTAL NO. OF CREDITS					26

Semester - 2

Course Code	Title of Paper	Hours / Per Week			
		L	T	P	C
22254C21	Tooling for Manufacturing	4	-	-	4
22254C22	MEMS and Nano Technology	4	-	-	4
22254C23	Manufacturing Metrology and Quality Control	4	-	-	4
22254E24 (A to C)	Elective - II	3	-	-	3
22254E25 (A to C)	Elective - III	3	-	-	3
22254L26	Automation Lab	-	-	3	3
222TECWR	Technical Writing/Seminar	-	-	3	3
TOTAL NO. OF CREDITS					24


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Thanjavur - 613 403.

Semester - 3

Course Code	Title of Paper	Hours / Per Week			
		L	T	P	C
22254C31	Metal Forming Process	4	-	-	4
22254E32 (A to C)	Elective - IV	3	-	-	3
22254E33 (A to B)	Elective - V	3	-	-	3
22254E34 (A to B)	Elective - VI	3	-	-	3
22254P35	Project Work Phase I	-	-	10	10
TOTAL NO. OF CREDITS					23

Semester - 4

Course Code	Title of Paper	Hours / Per Week			
		L	T	P	C
22254P41	Project Work Phase II	-	-	15	15
TOTAL NO. OF CREDITS					15

ELECTIVE - I

Course Code	Title of Paper	Hours / Per Week			
		L	T	P	C
22254E16A	Materials Management and Logistics	3	-	-	3
22254E16B	Quality And Reliability Engineering	3	-	-	3
22254E16C	Manufacturing Information Systems	3	-	-	3


HOD

Page 4



ELECTIVE -II

Course Code	Title of Paper	Hours / Per Week			
		L	T	P	C
22254E24A	Finite Element Application in Manufacturing	3	-	-	3
22254E24B	Lean Manufacturing	3	-	-	3
22254E24C	Material management	3	-	-	3

ELECTIVE -III

Course Code	Title of Paper	L	T	P	C
22254E25A	Non-Destructive Testing And Evaluation	3	-	-	3
22254E25B	Maintenance Management	3	-	-	3
22254E25C	Optimization Techniques	3	-	-	3

ELECTIVE -IV

22254E32A	Process Planning And Cost Estimation	3	-	-	3
22254E32B	Instrumentation and Control Engineering	3	-	-	3
22254E32C	Research Methodology	3	-	-	3


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ELECTIVE -V

Course Code	Title of Paper	Hours / Per Week			
		L	T	P	C
22254E33A	Product Design and Development	3	-	-	3
22254E33B	Fluid Power Automation	3	-	-	3
22254E33C	Internet Of Things For Manufacturing	3	-	-	3

ELECTIVE -VI

22254E34A	Advanced Material Technology	3	-	-	3
22254E34B	Industrial Safety	3	-	-	3
22254E34C	Additive Manufacturing	3	-	-	3

Total No of Credits - 88



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**DEPARTMENT OF
MECHANICAL ENGINEERING**

PROGRAMME HANDBOOK

**M.Tech. – Manufacturing Technology
PART TIME PROGRAMME
Regulation 2022**

(for candidates admitted to M.Tech Mechanical Engineering programme from June 2022 onwards)

COURSE STRUCTURE

SEMESTER-I

Course Code	Title of Paper	Hours / Per Week			
		L	T	P	C
22248S11EP	Advanced Engineering Mathematics	3	1	-	4
22254C12P	Theory of Metal Cutting	3	1	-	4
22254C13P	Advanced Manufacturing Processes	3	1	-	4
22254L14P	CAD/CAM Laboratory	-	-	3	3
TOTAL NO. OF CREDITS					15

SEMESTER-II

Course Code	Title of Paper	Hours / Per Week			
		L	T	P	C
22254C21P	Tooling for Manufacturing	3	1	-	4
22254C22P	MEMS and Nano Technology	4	-	-	4
22254E23_P	Elective - I	4	-	-	3
22254L24P	Automation Lab	-	-	3	3
222TECWRP	Technical Writing/Seminar	-	-	3	3
TOTAL NO. OF CREDITS					17

SEMESTER-III

Course Code	Title of Paper	Hours / Per Week			
		L	T	P	C
22254C31P	Advances in Casting and Welding	3	1	-	4
22254C32P	Automated Computer Integrated Manufacturing Systems	3	1	-	4
22254E33P	Elective II	4	-	-	3
TOTAL NO. OF CREDITS					11



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SEMESTER-IV

Course Code	Title of Paper	Hours / Per Week			
		L	T	P	C
22254C41P	Manufacturing Metrology and Quality Control	4	-	-	4
22254C42P	Metal Forming Process	4	-	-	4
22254E43_p	Elective III	4	-	-	3
22254P44P	Project Work Phase - I	-	-	10	10
TOTAL NO. OF CREDITS					21

SEMESTER-V

Course Code	Title of Paper	Hours / Per Week			
		L	T	P	C
22254E51_P	Elective IV	4	-	-	3
22254E52_P	Elective V	4	-	-	3
22254E53_P	Elective VI	4	-	-	3
TOTAL NO. OF CREDITS					9

SEMESTER-VI

Course Code	Title of Paper	Hours / Per Week			
		L	T	P	C
22254P61P	Project Work Phase - II	-	-	15	15
TOTAL NO. OF CREDITS					15


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ELECTIVE-I

Course Code	Title of Paper	Hours / Per Week			
		L	T	P	C
22254E23AP	Finite Element Application in Manufacturing	4	-	-	3
22254E23BP	Lean Manufacturing	4	-	-	3
22254E23CP	Design and Analysis of Experiments	4	-	-	3

ELECTIVE-II

Course Code	Title of Paper	Hours / Per Week			
		L	T	P	C
22254E33AP	Materials Management And Logistics	4	-	-	3
22254E33BP	Quality And Reliability Engineering	4	-	-	3
22254E33CP	Manufacturing Information Systems	4	-	-	3

ELECTIVE-III

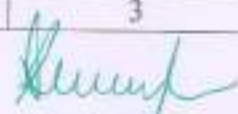
Course Code	Title of Paper	Hours / Per Week			
		L	T	P	C
22254E43AP	Non-Destructive Testing And Evaluation	4	-	-	3
22254E43BP	Maintenance Management	4	-	-	3
22254E43CP	Optimization Techniques	3	1	-	3

ELECTIVE-IV

Course Code	Title of Paper	Hours / Per Week			
		L	T	P	C
22254E51AP	Process Planning And Cost Estimation	4	-	-	3
22254E51BP	Instrumentation and Control Engineering	4	-	-	3
22254E51CP	Research Methodology	3	-	-	3


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ELECTIVE-V

Course Code	Title of Paper	Hours / Per Week			
		L	T	P	C
22254E52AP	Product Design and Development	4	-	-	3
22254E52BP	Fluid Power Automation	4	-	-	3
22254E52CP	Internet Of Things For Manufacturing	4	-	-	4

ELECTIVE-VI

Course Code	Title of Paper	Hours / Per Week			
		L	T	P	C
22254E53AP	Advanced Material Technology	4	-	-	3
22254E53BP	Industrial Safety	4	-	-	3
22254E53CP	Additive Manufacturing	4	-	-	4

Total No of Credits - 88



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METROLOGY AND QUALITY CONTROL

OBJECTIVES

- To understand the concept of metrology and principles of measuring instruments
- To understand the concept of different types of comparative measurements
- To gain the knowledge about calibration technique in measuring instruments
- To impart knowledge on quality control and control charts • To impart the knowledge on control charts for variables

UNIT - I BASICS OF METROLOGY

9

Definition of metrology - Objective of metrology - Precision and Accuracy - Sources of errors - Concept of Repeatability, Sensitivity, Readability and Reliability - Linear measurements - types - Vernier caliper Micrometer - types - Vernier height gauges - depth gauges - Slip gauges - Angular measurements - Types - Vernier and optical Bevel protractor - Sine Principle and Sine Bar - Optical Instruments for angular measurement - Autocollimator - Angle Gauge.

UNIT-II COMPARATIVEMEASUREMENT

9

Comparators - Introduction - Characteristics and uses - types - mechanical - Optical - profile projector - Electrical - pneumatic - Testing of straightness - Flatness - parallelism and circularity- Limit gauges - types- Taylors principle - Snap gauges - plain plug gauges - progressive plug gauges - Ring gauges - Thread pitch gauges - feeler gauges - radius gauges - engineers square and parallel - dial gauges - types - plunger type - needle type - Magnetic V block.

UNIT - III CALIBRATION AND MEASURING MACHNES

9

Introduction - sensitivity - Range - standards - Traceability - Calibration of Vernier caliper - Micrometer - Dial gauges - Measurement using surface roughness tester - Co-ordinate measuring machine - Types - Tool makers microscope - Gear measurement - Gear tooth caliper - Circular pitch measuring machine.

UNIT - IV QUALITY CONTROL FOR VARIABLES

9

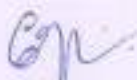
Introduction, definition of quality - Facts of quality - basic concept of quality, definition of SQC, benefits and limitation of SQC, Quality assurance - Concepts of Quality control - Quality cost- Variation in process- factors - process capability - process capability studies and simple problems.

UNIT - V PROCESS CONTROL FOR ATTRIBUTES

9

Control chart for proportion or fraction defectives - p chart and np chart - control chart for defects - C and U charts, State of control and process out of control identification in charts - Acceptance sampling plan - Types - O.C. curves - producer's Risk and consumer's Risk. AQL, LTPD, AOQL. concepts-standard sampling plans for AQL and LTPD- uses of standard sampling plans.

TOTAL HOURS: 45



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COURSE OUTCOMES

1. Understand the basics of metrology and linear and angular measuring instruments
2. Explain the working principles of comparators and limit gauges
3. Determine the status of the measuring instruments and different parameters using measuring machines
4. Understand the concepts of quality and to Solve the problems in process control charts for variables
5. Solve the problems in process control charts for attributes

TEXT BOOK

1. R.K.JAIN, Engineering Metrology, Khanna publishers, 21st edition, 1984
2. GRANT, EUGENE.L "Statistical Quality Control", Tata McGraw-Hill, 7th edition, 2005

REFERENCES

1. MONOHAR MAHAJAN, "Statistical Quality Control", Dhanpat Rai & Sons, 2001.
2. R.C.GUPTA, "Statistical Quality control", Khanna Publishers, 9th edition, 1998.
3. BESTERFIELD D.H., "Quality Control", Prentice Hall, 7th edition, 2003.
4. SHARMA S.C., "Inspection Quality Control and Reliability", Khanna Publishers, 2002.



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ADVANCED AUTOMOTIVE SYSTEMS

OBJECTIVES

Appreciate and explain advancements in different components and systems of Automobile.

UNIT - I COMBUSTION CHAMBERS AND STRATIFIED ENGINES 9

Petrol engine combustion Chambers-types-construction, merits and demerits-Thead, L head, F head and I head Air swirl-need-methods of generating swirl, Diesel engine combustion Chambers-open combustion chamber-pre-combustion chamber-M combustion chamber-construction and working.

UNIT - II ADVANCEMENTS IN AIR INDUCTION SYSTEMS 9

Variable geometry intake manifold-concept-need-working principle. Variable valve timing-concept-need-types-working principle of cam changing VVT (Honda VTEC)-Cam phasing VVT (Toyota VVT)-advantages, supercharging-concept-need-types of superchargers, turbo charging-concept-need-types, constant pressure turbo charging-construction and working-merits-demerits, pulse pressure turbo charging-construction and working-merits-demerits.

UNIT - III ALTERNATE PROPULSION TECHNOLOGY 9

Petrol wankel engine-construction and working-advantages and disadvantages. Fuel cells-types, proton exchange membrane type fuel cell-working principle -advantages and disadvantages. Hybrid propulsion-concept, hybrid-working principle-merits-demerits,parallel hybrid-working principle-advantages and disadvantages. Battery operated vehicle-working principle-advantages and disadvantages, regenerative braking-need-working principle.

UNIT - IV ADVANCEMENTS IN STEERING AND SUSPENSION SYSTEM 9

Air spring-types-advantages, bellows air spring-construction and working, piston air spring-construction and working, air suspension-layout and working-advantages, hydro-elastic spring-construction and working, hydro-elastic suspension-layout and working-advantages. power steering-need-types, integral-construction and working, linkage power steering construction and working.

UNIT - V ADVANCEMENTS IN FINAL DRIVES AND BRAKES 9

Limited slip differential-need-types-construction and working of clutch type LSD, Differential lock-need-construction and working of dog clutch type differential lock. Servo brakes-need-types, vacuum servo brakes-layout-working, vacuum servo booster construction and working, power brakes-need -types, air brake system-layout and working, air brake valve-brake chamber.

TOTAL HOURS: 45



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COURSE OUTCOMES

1. Describe the construction, working, merits and demerits of different combustion chamber of S I and C I engines.
2. Explain the need, construction and working of different advancements in Air intake systems of engine.
3. Explain the need, construction and working of different alternate/modern propulsion systems of Auto mobiles.
4. Explain the need, construction and working of different alternate/modern suspension and steering systems of Automobile.
5. Explain the need, construction and working of different alternate/modern Final drive and Braking systems of Automobiles.

REFERENCES

1. Understanding Automotive electronics William Ribben Butterworth Heinemann.
2. A Systems Approach to Automotive technology Jack Erjavec Cengage Learning.
3. Electronic Engine Controls Steve.V.Hatch Cengage Learning.
4. Truck engines Fuel& computerized management systems Sean Bennett Cengage Learning.
5. Advanced vehicle technology Heinz Heisler Butterworth Heinemann.



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ARTIFICIAL NEURAL NETWORKS

OBJECTIVES

1. To understand the biological neural network and to model equivalent neuron models.
2. To understand the architecture, learning algorithms.
3. To know the issues of various feed forward and feedback neural networks.
4. To explore the Neuro dynamic models for various problems.

UNIT-I INTRODUCTION

9

A Neural Network, Human Brain, Models of a Neuron, Neural Networks viewed as Directed Graphs, Network Architectures, Knowledge Representation, Artificial Intelligence and Neural Networks Learning Process: Error Correction Learning, Memory Based Learning, Hebbian Learning, Competitive, Boltzmann Learning, Credit Assignment Problem, Memory, Adaption, Statistical Nature of the Learning Process

UNIT-II SINGLE LAYER PERCEPTRONS

9

Adaptive Filtering Problem, Unconstrained Organization Techniques, Linear Least Square Filters, Least Mean Square Algorithm, Learning Curves, Learning Rate Annealing Techniques, Perceptron –Convergence Theorem, Relation Between Perceptron and Bayes Classifier for a Gaussian Environment Multilayer Perceptron: Back Propagation Algorithm XOR Problem, Heuristics, Output Representation and Decision Rule, Computer Experiment, Feature Detection.

UNIT-III BACK PROPAGATION

9

Back Propagation and Differentiation, Hessian Matrix, Generalization, Cross Validation, Network Pruning Techniques, Virtues and Limitations of Back Propagation Learning, Accelerated Convergence, Supervised Learning

UNIT – IV SELF-ORGANIZATION MAPS (SOM)

9

Two Basic Feature Mapping Models, Self-Organization Map, SOM Algorithm, Properties of Feature Map, Computer Simulations, Learning Vector Quantization, Adaptive Patter Classification.

UNIT-V NEURO DYNAMICS

9

Dynamical Systems, Stability of Equilibrium States, Attractors, Neuro Dynamical Models, Manipulation of Attractors as a Recurrent Network Paradigm Hopfield Models – Hopfield Models, restricted boltzmen machine.

TOTAL HOURS: 45



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COURSE OUTCOMES

1. Upon completing this course, the student will be able to
2. Understand the similarity of Biological networks and Neural networks
3. Perform the training of neural networks using various learning rules.
4. Understanding the concepts of forward and backward propagations.
5. Understand and Construct the Hopfield models.

REFERENCES

1. Neural Networks in Computer Intelligence, Li Min Fu TMH 2003
2. Neural Networks -James A Freeman David M S Kapura Pearson Ed., 2004.
3. Artificial Neural Networks – B. Vegnanarayana Prentice Hall of India P Ltd 2005



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WIND ENERGY

UNIT 1 - INTRODUCTION TO WIND TECHNOLOGY AND COMPONENTS

Introduction and Status of Wind Energy Technology-Overview of Wind Turbine Components - Design aspects of Wind Turbine-The Aerodynamics of Wind Turbine-Wind Turbine Blade Manufacture-Role of Non Crimp fabric in Blade Manufacturing-Drive Train Concepts of Wind Turbine-Wind Turbine Gear Box-Wind Turbine Generator.

UNIT 2 - WIND RESOURCE ASSESSMENT

Wind Resource Assessment and Techniques-Guidelines for Wind Measurements-Wind Measurements by Remote Sensing Instruments-Wind Data Measurements and Analysis-Design and Layout of Wind Farms-Indian Wind Atlas: A Case Study-Forecasting of Wind and Energy Production.

UNIT 3 - WIND TURBINE TESTING & CERTIFICATION

Type Certification of wind turbine and overview of Design Requirements as per IEC 61400 - 1 Wind Turbine Testing & Measurement Techniques-Instrumentation for Wind Turbine Testing Safety and Function Testing-Power Curve Measurements-Quality aspects of Wind turbines.

UNIT 4 - WIND TURBINE PRE AND POST INSTALLATION

Wind Farm Developments and Related Issues -Economic Analysis of Wind Power Development Installation and Commissioning of Wind Turbine-Grid Integration of Wind Turbine-Wind Power Evacuation-Operation and Maintenance of Wind Farms-Wind Farm Management using SCADA Wind Turbine Condition Monitoring-Power Quality Characteristics of Wind Farms-Power System Studies for Renewable Integration

UNIT 5 - SMALL WIND TURBINE- MISCELLANEOUS / ANCILLARY

Small Wind Turbine Testing and Hybrid System-Role of NIWE in India Wind Energy Development-Wind Energy Development in India-Offshore Wind Energy: An Overview-Water Pumping Wind Mill and RE for Rural Development -Environmental Aspects of Wind Turbine Technology -Integration of Wind energy with other renewable sources.



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ELECTRICAL AUTOMOTIVES

UNIT: 1 -BATTERY

Principle and construction of Lead Acid Battery - Li-ion Battery – Nickel Cadmium Battery - Nickel Metal - Hybrid Battery - Sodium Sulfur Battery and Aluminum Air Battery - Characteristics of Battery - Battery Rating - Capacity and Efficiency - Various Tests on Battery - Battery Charging Techniques - Maintenance of batteries.

UNIT: 2 -ELECTRICAL COMPONENTS

Requirements of Starter Motor - Starter Motor types - construction and characteristics - Starter drive mechanisms - Starter Switches and Solenoids - Generators - Alternators types - Construction - Voltage and Current Regulation - Cutout relays and regulators – Charging circuits for D.C. Generator - A.C. Single Phase and Three Phase Alternators.

UNIT: 3 -IGNITION AND INJECTION SYSTEMS

Battery Coil and Magneto Ignition System - Circuit details - Components of Battery Coil and Magneto Ignition System - Centrifugal and Vacuum Advance Mechanisms - Spark Plugs - Constructional details and Types - CRDI

UNIT: 4 -ELECTRICAL AND ELECTRONIC IGNITION SYSTEMS

Electronically Assisted and Full Electronic Ignition System (MPFI) - Noncontact type Ignition Triggering devices - Capacitive Discharge Ignition - Distributor less Ignition System- Digital Ignition System - Control Strategy of Electronic Ignition System.

UNIT: 5 -WIRING, LIGHTING AND OTHER INSTRUMENTS AND SENSORS

Automotive wiring - insulated and earth return system - positive and negative earth systems - head lamp and indicator lamp details - electrical and electronic fuel lift pumps - theory and constructional details of dash board instruments - speedometer - odometer - fuel level indicator - oil pressure and coolant temperature sensors.



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SCHOOL OF ENGINEERING AND TECHNOLOGY
DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

BOARD OF STUDIES MEETING

CIRCULAR
2022 - 2023

06.05.2022

The BOS meeting is scheduled on 09.05.2022 at 10.30 am in the ECE LAB at PRIST University Vallam Campus under the Chairmanship of Prof. Dr. Smitha Elsa Peter. All are requested to attend without fail.

AGENDA OF THE MEETING

1. To confirm the previous minutes meetings.
2. To discuss the action taken on the previous meeting minutes
3. To scrutinize the stakeholder feed backs on B.Tech (FT/PT).
4. To scrutinize the stakeholder feed backs on M.Tech-Communication Systems (FT/PT).
5. To recommend the panel of Examiners for B.Tech (FT/PT).
6. To recommend the panel of Examiners for M.Tech-Communication Systems (FT/PT).
7. Subject to the prevailing condition, syllabus revision is to carried out for the higher semesters of B.Tech (FT).
8. To accomodate the suggestions revealed by stakeholders and to incorporate them as revised syllabus for B.Tech(PT) & M.Tech-Communication Systems(FT/PT).
9. To discuss about addition of new Value added courses.

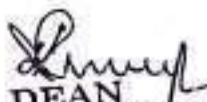
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The following Members attended the meeting:

S.No	Designation	Name	Signature
1	Chairperson/HoD	Dr. Smitha elsa peter	Smitha
2	External Expert- Industry	Mr.A.Jothivelu	A. Jothivelu
3	External Expert-Academic	Dr.T.Jayasankar	T. Jayasankar
4	Professor	Dr. S. Devi	S. Devi
5	Professor	Dr. Smitha elsa peter	Smitha
6	Associate Professor	Dr. A. Rijuvana begum	A. Rijuvana begum
7	Associate Professor	Dr. C. Rajinikanth	C. Rajinikanth
8	Assistant Professor	S. Maheshwaran	S. Maheshwaran
9	Assistant Professor	S.Saraswathy	S. Saraswathy
10	Special Invitee-Dean	Prof.R.Tamizhselvan	R. Tamizhselvan
11	Special Invitee-Alumnus/Alumna	NARANDHAR B.	N. Narandhar B.
12	Special Invitee -Current student - UG or PG	SATHEESH M.	S. Satheesh M.


 Head of the Department
 Department Of electronics and
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Ponnaiyah Ramajayam Institute of Science and Technology
PRIST Deemed to be University
School of Engineering and Technology
Department of Electronics and Communication Engineering
Minutes of the meeting of the Board of Studies (BoS)*

Date: 09.05.2022
Venue: ECE LAB
Time: 10.30 a.m

Members present:

Chair: Prof. Dr. Smltha Elsa Peter, Ph.D
HOD/ECE
PRIST

External Members

S.No.	Name/Degree/Designation	Institute/Organization/ Full address	Online/ Physical	Signature (scan, if online)
1	Dr. T. Jayasankar, Ph.D Asst. Professor, (Sr. Gr)	UCE, BIT campus, Anna University, Tiruchirappalli.	Physical	G. Jayasankar 9/5/22
2	Mr. A. Jothivelu B.E., M.S (NIT-Trichy)	Senior Sub Divisional Engineer BSNL, Tiruchirappalli.	Physical	A. Jothivelu 9/5

Internal Members

S.No.	Name/Degree/Designation	Department	Online/ Physical	Signature (scan, if online)
1.	Prof. Dr. A. Rijuva Begum, Ph.D/Professor	ECE	Physical	A. Rijuva Begum
2.	Prof. Dr. P. Geetha Ph.D/Associate Professor	ECE	Physical	P. Geetha
3.	Prof. Dr. C. Rajinikanth Ph.D/Associate Professor	ECE	Physical	C. Rajinikanth
4.	Prof. Mr. S. Maheshwaran M.E/Assistant Professor	ECE	Physical	S. Maheshwaran
5.	Prof. Mrs. A. Aarathi M.E/Assistant Professor	ECE	Physical	A. Aarathi

Smltha
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Head of the Department
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Invited Participants

S.No.	Name/Degree/Designation	Department/Class Institute/Organization/Address	Online/ Physical	Signature (scan, if online)
1	Prof.Dr.Latha Ph.D/Professor	CSE/PRIST	Physical	
2	Mr.Abhishek Kunal B.E/ Data center Architect	Etisalit,Dubai.	Physical	
3	Mr.B.Narandhar	Student	Physical	

Agenda

1. To Confirm the previous Meeting Minutes
2. To discuss the action taken on the previous Meeting Minutes
3. To scrutinize the stakeholder feed backs on B.Tech(FT/PT).
4. To scrutinize the stakeholder feed backs on M.Tech-Communication Systems (FT/PT).
5. To recommend the panel of Examiners for B.Tech(FT/PT).
6. To recommend the panel of Examiners for M.Tech-Communication Systems(FT/PT).
7. To discuss about B.Tech(FT) syllabus revision of higher semesters with Subject to the prevailing condition.
8. To accommodate the suggestions revealed by stakeholders and to incorporate them as revised syllabus for B.Tech(PT) & M.Tech-Communication Systems(FT/PT).

Head of Department
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MINUTES OF THE MEETING

At the outset, the Chairman BOS welcomed the members for attending the meeting of the Board of Studies. In her introductory remarks, she described the agenda items.

Agendum 1:
Discussion: To confirm the previous BOS Meeting Minutes and to discuss the action taken on the previous BoS Meeting Minutes.
Resolution: The chairman confirmed the previous meeting minutes of BoS and discussed the action taken on the previous BOS Meeting Minutes.

Agendum 2:
Discussion: To scrutinize the abstract of stakeholders feedback on existing curriculum and syllabi for B.TECH-ECE (Full Time/Part Time) and M.TECH-Communication Systems (Full Time/Part Time).
Resolution: The members of the Board thoroughly scrutinized the existing curriculum and syllabi and the abstract of stakeholders feedback on B.TECH-ECE (Full Time/Part Time) and M.TECH-Communication Systems (Full Time/Part Time) and resolved to revise the curriculum in the subsequent syllabus revision.

Agendum 3:
Discussion: To discuss about B.Tech(FT) syllabus revision of higher semesters subject to the prevailing condition.
Resolution: Subject to the prevailing condition, syllabus revision is to be carried out for the higher semesters of B.Tech(FT).

Agendum 4:
Discussion: To accommodate the suggestions revealed by stakeholders and to incorporate them as revised syllabus for B.Tech(PT) & M.Tech-Communication Systems(FT/PT).
Resolution: The members of the board have unanimously recommended to introduce the new courses with the revised curriculum and syllabi for B.TECH-ECE(PT) & M.TECH - Communication Systems (FT/PT).

Agendum 5:
Discussion: To recommend the panel of Examiners for B.Tech(FT/PT) and for M.Tech-Communication Systems(FT/PT).
Resolution: The members of the board also scrutinized and updated the panel of examiners and recommended the panel of examiners for the B.TECH -ECE (FT/PT) & M.TECH - Communication Systems (FT/PT), and submitted the same for the Academic Council for its approval.

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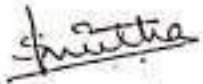
Agendum 6:

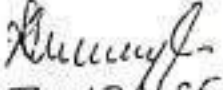
Discussion: To recommend addition of new Value added courses

Resolution: The members of the Board analysed the feedback from various stakeholders and suggested the following value added courses.

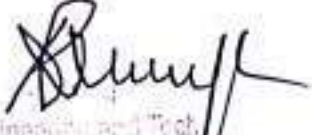
- ✓ Introduction to Microcontroller
- ✓ Introduction to C Programming
- ✓ Introduction To Labview
- ✓ Mobile Phone Technology

The meeting was concluded with thanks from the chairman.

Signature: 
Chair/HoD: Dr. Smetha Elsa Peter, HOD
Dept.: ECE
Name: Dr. Smetha Elsa Peter

Signature: 
Dean: R. TAMIZH SELVAN
School: Engg. & Technology
Name: R. TAMIZH SELVAN


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ANNEXURE-I:

B.TECH(ECE)-Part Time

ITEM 1: It is suggested by board members, The course 22152C12P – Electromagnetic Fields , is re-designed , updated all the 5 units in syllabus instead of Electromagnetic Theory in I semester.

ITEM 2: It is proposed by board that the course 22148S21BP – Probability and Random Processes, a foundation course brought forward from III to II semester.

ITEM 3: The Board members are suggested that the course 22152C22P – Communication Theory is shifted from III to II semester instead of Electrical Engineering and Control Systems.

ITEM 4: The Board suggested that the course 22148S31BP- Numerical Methods, a foundation course is brought forward from III to II semester

ITEM 5: It is proposed to introduce course 22152C32P – Microprocessor and Microcontrollers instead of 19152C32P- Microprocessor Interfacing and Applications to acquire the depth knowledge in processors and controllers.

ITEM 6: The board members are suggested that the course from IV semester, 22152C34P – Digital Communication, is shifted to III semester.

ITEM 7: The board members are suggested that introduce a lab course 22152L35P - Microprocessor and Microcontrollers Lab is revised so as to understand the advanced processor controller interfacing programs.

ITEM 8: It is proposed by member that the course 22152C41P – Medical Electronics is brought forward from VI to IV semester.

ITEM 9: The board members are suggested that the course 22160C53P – Principles of Management is brought as a core paper from list of electives in previous curriculum.

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ITEM 10: It is proposed by board members that the new course 22152C61P – Wireless Communication instead of 19152C61P- Mobile and Wireless Communication is to understand the concepts of advanced wireless techniques.

ITEM 11: The board members are suggested that a course from Vsemester, 22152C62P – VLSI Design is pushed to VI semester and also has revised all the 5 Units to incorporate the various approaches for design in VLSI.

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ITEM 12: It is proposed by board members that the new course is introduced, 22152C63P – Embedded and Real Time Systems instead of 19152C63P- Microcontroller and Embedded Systems to incorporate fundamentals and advancements in Embedded systems.

ITEM 13: It is proposed by board that the board members are suggested that a course 22152C72P – Wireless Networks has revised all Units from I to V to include fundamental concepts in wireless networks.

ITEM 14: It is proposed by board members that the new elective course 22152E64AP – Professional Ethics In Engineering is introduced to create an awareness on Engineering Ethics and Human Values, to instill Moral and Social Values and Loyalty and to appreciate the rights of others.

ITEM 15: The board members are suggested that the elective course 22152E64CP- Robotics and Automation is changed instead of 19152E64CP- Robotics and all units I to V is revised.

ITEM 16: It is proposed by board members that the board members are suggested that changed the elective course from VII semester, 22152E74BP- Advanced Microprocessors and Microcontrollers instead of 19152E74BP- Advanced Microprocessors and also has revised its unit from I to V.

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Inclusion of Courses in B.Tech., (PT-(R-2022))

S.No.	Sub.Code	Sub Name	L	T	P	C
1.	22152C32P	Microprocessors and Microcontrollers	3	1	0	4
2.	22160C53P	Principles of Management	3	1	0	4
3.	22152C61P	Wireless Communication	4	0	0	4
4.	22152E64AP	Professional Ethics in Engineering	4	0	0	4
5.	22152C63P	Embedded and Real Time Systems	3	1	0	4
6.	22152C63P	Embedded and RealTime Systems	3	1	0	4

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B.TECH (PART TIME)-ECE-R-2022 SEMESTER I - VII CURRICULUM
SEMESTER-I

S.NO	SUBCODE	SUBJECTNAME	Periods Per Week			C
			L	T	P	
1	22148S11P	Transforms and Partial Differential Equations	3	1	0	4
2	22152C12P	Electromagnetic Fields	3	1	0	4
3	22152C13P	Digital Electronics	3	1	0	4
4	22152C14P	Electronic Circuits-I	3	0	0	3
5	22152C15P	Signals and Systems	4	0	0	4
TOTAL CREDITS						19

SEMESTER-II

S.NO	SUBCODE	SUBJECTNAME	Periods Per Week			C
			L	T	P	
1	22148S21BP	Probability and Random Processes	3	1	0	4
2	22152C22P	Communication Theory	3	0	0	3
3	22152C23P	Linear Integrated Circuits	3	1	0	4
4	22152C24P	Electronic Circuits- II	3	1	0	4
5	22152C25P	Transmission Lines and Waveguides	4	0	0	4
TOTAL CREDITS						19

SEMESTER-III

S.NO	SUBCODE	SUBJECTNAME	Periods Per Week			C
			L	T	P	
1.	22148S31BP	Numerical Methods	3	1	0	4
2.	22152C32P	Microprocessor and Microcontrollers	3	1	0	4
3.	22152C33P	Digital Signal Processing	3	1	0	4
4.	22152C34P	Digital Communication	3	1	0	4
5.	22152L35P	Microprocessor and Microcontrollers Lab	0	0	3	2
TOTAL CREDITS						18

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SEMESTER-IV

S.NO	SUBCODE	SUBJECTNAME	Periods Per Week			C
			L	T	P	
1	22152C41P	Medical Electronics	3	1	0	4
2	22152C42P	Antenna and Wave Propagation	3	1	0	4
3	22152C43P	Wireless Networks	4	0	0	4
4	22152E44_P	Elective-I	4	0	0	4
5	22152L45P	Networks and Communication Lab	0	0	3	2
TOTAL CREDITS						18

SEMESTER-V

S.NO	SUBCODE	SUBJECTNAME	Periods Per Week			C
			L	T	P	
1	22152C51P	Optical Communication and Networks	4	0	0	4
2	22152C52P	Microwave Engineering	4	0	0	4
3	22160C53P	Principles of Management	3	1	0	4
4	22152E54_P	Elective-II	4	0	0	4
5	22152L55P	Optical Communication and Microwave Lab	0	0	3	2
TOTAL CREDITS						18

SEMESTER-VI

S.NO	SUBCODE	SUBJECTNAME	Periods Per Week			C
			L	T	P	
1	22152C61P	Wireless Communication	4	0	0	4
2	22152C62P	VLSI Design	3	1	0	4
3	22152C63P	Embedded and Real Time Systems	3	1	0	4
4	22152E64_P	Elective-III	4	0	0	4
5	22152L65P	VLSI and Embedded Systems Lab	0	0	3	2
TOTAL CREDITS						18

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SEMESTER-VII

S.NO	SUBCODE	SUBJECTNAME	Periods Per Week			C
			L	T	P	
1	21160S71P	Total Quality Management	3	0	0	3
2	22152C72P	Wireless Networks	3	1	0	4
3	22152C73P	Telecommunication Switching and Networks	4	0	0	4
4	22152E74_P	ElectiveIV	3	0	0	3
5	22152P75P	ProjectWork	0	0	12	6
TOTAL CREDITS						20

LIST OF ELECTIVES

ELECTIVE-I (SEMESTER-IV)

S.No	Sub Code	Sub Name	Periods Per Week			C
			L	T	P	
1	22152E44AP	High Speed Networks	4	0	0	4
2	22152E44BP	Advanced Digital Signal Processing	4	0	0	4
3	22152E44CP	Speech Processing	4	0	0	4
4	22152E44DP	Fuzzy Logic and Neural Networks	4	0	0	4
5	22152E44EP	Advanced Electronic System Design	4	0	0	4

ELECTIVE-II (SEMESTER-V)

S.No	Sub Code	Sub Name	Periods Per Week			C
			L	T	P	
1	22152E54AP	Environmental Science and Engineering	4	0	0	4
2	22152E54BP	Optoelectronic Devices	4	0	0	4
3	22152E54CP	Radar and Navigational Aids	4	0	0	4
4	22152E54DP	Digital Image Processing	4	0	0	4
5	22152E54EP	Engineering Acoustics	4	0	0	4

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ELECTIVE-III(SEMESTER-VI)

S.No	Sub Code	Sub Name	Periods Per Week			C
			L	T	P	
1	22152E64AP	Professional Ethics in Engineering	4	0	0	4
2	22152E64BP	Satellite Communication	4	0	0	4
3	22152C63P	Embedded and Real Time Systems	3	1	0	4
4	22152E64DP	Remote sensing	4	0	0	4
5.	22152E64EP	Network Security	4	0	0	4

ELECTIVE-IV(SEMESTER-VII)

S.No	Sub Code	Sub Name	Periods Per Week			C
			L	T	P	
1	22152E74AP	Power Electronics	3	0	0	3
2	22152E74BP	Advanced Microprocessors and Microcontrollers	3	0	0	3
3	22152E74CP	Electromagnetic Interference and Compatibility	3	0	0	3
4	22152E74DP	SolidState Electronic Drives	3	0	0	3
5	22152E74EP	Computer Hardware and Interfacing	3	0	0	3

B.TECH (PART TIME) – ECE – R-2022

COURSESTRUCTUREANDCREDITSDISTRIBUTION

Sem.	CoreCourses				Elective Courses		Total Credits
	Theory Courses		Practical Courses		Nos.	Credits	
	Nos.	Credits	Nos.	Credits			
I	05	19	-	-	-	-	19
II	05	19	-	-	-	-	19
III	04	16	01	02	-	-	18
IV	03	12	01	02	01	04	18
V	03	12	01	02	01	04	18
VI	03	12	01	02	01	04	18
VII	03	11	01	06	01	03	20
TotalCredits							130

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ANNEXURE-II:

M.TECH(Communication Systems)- FullTime & Part Time

ITEM 1: The board members are suggested that 22271C12/22271C12P- Advanced Digital Signal Processing -This new course is introduced instead of 19271C12/19271C12P- Statistical Signal Processing to comprehend mathematical description and modelling of discrete time random signals.

ITEM 2: It is proposed by board members that 22271C13/22271C13P-Advanced Digital Communication Techniques -This new course is introduced instead of 19271C13/19271C13P- Modern Digital Communication Systems to understand the basics of signal-space analysis and digital transmission.

ITEM 3: The board members are suggested that 22271C14/22271C31P- Optical Networks -This course is introduced and revised instead of 19271C23/19271C42P- Fiber Optic Networking to get Understanding the Optical system components like optical amplifiers, wavelength converters.

ITEM 4: It is suggested by board members that 22271C23/22271C42P- Electromagnetic Interference and Compatibility -This new course is introduced to familiarize the basics of EMI and EMI sources.

ITEM 5: The board members are suggested that the course 22271E25B /22271E43BP-Soft Computing Techniques is revised all the 5 units instead of 19271E25B/19271E43BP Soft Computing.

ITEM 6: The members of board are suggested that the new course 22271E34A/22271E53AP - Space Time Wireless Communication is introduced instead of 19271E34A/19271E53AP- Simulation of Communication Networks also to acquire the knowledge on various modulation and coding schemes for space-time Wireless Communications.

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SCHOOL OF ENGINEERING AND TECHNOLOGY
DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Inclusion of Courses in M.Tech., (Communication Systems)-Full Time & Part Time-(R-2022)

S.No.	Sub.Code	Sub Name	L	T	P	C
1.	22271C12	Advanced Digital Signal Processing	3	1	0	4
2.	22271C13	Advanced Digital Communication Techniques	3	1	0	4
3.	22271C14	Optical Networks				
4.	22271E25B	Soft Computing Techniques	3	0	0	3
5.	22271E34A	Space Time Wireless Communication	3	0	0	3
6.	22271C23	Electromagnetic Interference and Compatibility	4	0	0	4


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**M.TECH.COMMUNICATION SYSTEMS-FULLTIME-R-2022 SEMESTER I – IV CURRICULUM
SEMESTER I**

S.N	SUBCODE	SUBJECT	L	T	P	C
Theory						
1	22248S11B	Applied Mathematics for Electronics Engineering	3	1	0	4
2	22271C12	Advanced Digital Signal Processing	3	1	0	4
3	22271C13	Advanced Digital Communication Techniques	3	1	0	4
4	22271C14	Optical Networks	4	0	0	4
5	22271C15	Advanced Radiation Systems	4	0	0	4
6	22271E16_	Elective-I	3	0	0	3
Practical						
7	22271L17	Communication Systems Lab-I	0	0	3	3
Total			20	3	3	26

SEMESTER II

S.N	SUBCODE	SUBJECT	L	T	P	C
Theory						
1	22271C21	Mobile Communication Networks	4	0	0	4
2	22271C22	Advanced Microwave Systems	4	0	0	4
3	22271C23	Electromagnetic Interference and Compatibility	4	0	0	4
4	22271E24_	Elective-II	3	0	0	3
5	22271E25_	Elective-III	3	0	0	3
Practical						
6	22271L26	Communication Systems Lab-II	0	0	3	3
7	222TECWR	Technical Writing/Seminars	0	0	3	3
Total			18	0	6	24

SEMESTER III

S.N	SUBCODE	SUBJECT	L	T	P	C
Theory						
1	22271C31	Wireless Sensor Networks	4	0	0	4
2	22271E32_	Elective-IV	3	0	0	3
3	22271E33_	Elective-V	3	0	0	3
4	22271E34_	Elective-VI	3	0	0	3
Project						
5	22271P35	Project Phase-I	0	0	10	10
Total			13	0	10	23

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SEMESTER IV

S.N	SUBCODE	SUBJECT	L	T	P	C
1	22271P41	Project Phase-II	0	0	15	15
Total			0	0	15	15
TOTALNO.OFCREDITS						88

LIST OF ELECTIVES
Elective-I(SEMESTER-I)

S.N	SUBCODE	SUBJECT	L	T	P	C
1.	22271E16A	Internetworking and Multimedia	3	0	0	3
2.	22271E16B	Digital Image Processing	3	0	0	3
3.	22271E16C	LASER Communication	3	0	0	3

Elective-II(SEMESTER-II)


S.N	SUBCODE	SUBJECT	L	T	P	C
1.	22271E24A	High Speed Switching Architecture	3	0	0	3
2.	22271E24B	DSP Processor Architecture and Programming	3	0	0	3
3.	22271E24C	Digital Speech Processing	3	0	0	3

Elective-III(SEMESTER-II)

S.N	SUBCODE	SUBJECT	L	T	P	C
1.	22271E25A	Digital Communication Receivers	3	0	0	3
2.	22271E25B	Soft Computing Techniques	3	0	0	3
3.	22271E25C	Communication Network Security	3	0	0	3

Elective-IV(SEMESTER-III)

S.N	SUBCODE	SUBJECT	L	T	P	C
1.	22271E32A	Software Defined Radio	3	0	0	3
2.	22271E32B	Satellite Communication	3	0	0	3
3.	22271E32C	CDMA Systems	3	0	0	3


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Elective-V(SEMESTER-III)

S.N	SUBCODE	SUBJECT	L	T	P	C
1.	22271E33A	Wavelets and Multi Resolution Processing	3	0	0	3
2.	22271E33B	High Performance Communication Networks	3	0	0	3
3.	22271E33C	Advanced Microprocessors and Microcontrollers	3	0	0	3

Elective-VI(SEMESTER-III)

S.N	SUBCODE	SUBJECT	L	T	P	C
1.	22271E34A	Space Time Wireless Communication	3	0	0	3
2.	22271E34B	Medical Imaging	3	0	0	3
3.	22271E34C	Mobile ADHOC Networks	3	0	0	3

M.TECH.COMMUNICATIONSYSTEMS-FULLTIME-R-2022
Course Structure and Credit Distribution

Sem.	CoreCourses				Elective Courses		Foundation Courses		Total Credits
	Theory Courses		Practical Courses		Nos.	Credits	Nos.	Credits	
	Nos.	Credits	Nos.	Credits					
I	04	16	01	03	01	03	01	04	26
II	03	12	02	06	02	06	-	-	24
III	01	04	01	10	03	09	-	-	23
IV	-	-	01	15	-	-	-	-	15
TotalCredits									88

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HOD

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M.TECH (PARTTIME)-COMMUNICATION SYSTEMS-R-2022

SEMESTER-I VI CURRICULUM SEMESTER I

S.N	SUBCODE	SUBJECT	L	T	P	C
Theory						
1	22248S11BP	Applied Mathematics for Electronics Engineering	3	1	0	4
2	22271C12P	Advanced Digital Signal Processing	3	1	0	4
3	22271C13P	Advanced Digital Communication Techniques	3	1	0	4
Practical						
4	22271L14P	Communication Systems Lab-I	0	0	3	3
Total						15

SEMESTER II

S.N	SUBCODE	SUBJECT	L	T	P	C
Theory						
1	22271C21P	Mobile Communication Networks	4	0	0	4
2	22271C22P	Advanced Microwave Systems	4	0	0	4
3	22271E23_P	Elective-I	3	0	0	3
Practical						
4	22271L24P	Communication Systems Lab-II	0	0	3	3
5	192TECWRP	Technical Writing/Seminars	0	0	3	3
Total						17

SEMESTER III

S.N	SUBCODE	SUBJECT	L	T	P	C
Theory						
1	22271C31P	Electromagnetic Interference and Compatibility	4	0	0	4
2	22271C32P	Advanced Radiation Systems	4	0	0	4
3	22271E33_P	Elective-II	3	0	0	3
Total						11

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SEMESTER V

S.N	SUBCODE	SUBJECT	L	T	P	C
Theory						
1	22271C41P	Wireless Sensor Networks	4	0	0	4
2	22271C42P	Optical Networks	4	0	0	4
3	22271E43_P	Elective-III	3	0	0	3
Project						
4	22271P44P	Project Work Phase-I	0	0	10	10
Total						21

SEMESTER V

S.N	SUBCODE	SUBJECT	L	T	P	C
Theory						
1	22271E51_P	Elective-IV	3	0	0	3
2	22271E52_P	Elective-V	3	0	0	3
3	22271E53_P	Elective-VI	3	0	0	3
Total						9

SEMESTER VI

S.N	SUBCODE	SUBJECT	L	T	P	C
1	22271P61P	Project Work Phase-II	0	0	15	15
Total						15
TOTAL NO.OF CREDITS						88

LIST OF ELECTIVES

Elective-I (SEMESTER-II)

S.N	SUBCODE	SUBJECT	L	T	P	C
1.	22271E23AP	High Speed Switching Architecture	3	0	0	3
2.	22271E23BP	DSP Processor Architecture and Programming	3	0	0	3
3.	22271E23CP	Digital Speech Processing	3	0	0	3

Elective-II (SEMESTER-III)

S.N	SUBCODE	SUBJECT	L	T	P	C
1.	22271E33AP	Internetworking and Multimedia	3	0	0	3
2.	22271E33BP	Digital Image Processing	3	0	0	3
3.	22271E33CP	LASER Communication	3	0	0	3

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M.TECH(PART TIME)-COMMUNICATIONSYSTEMS--R-2022

Course Structure and Credit Distribution

Sem.	Core Courses				Elective Courses		Foundation Courses		Total Credits
	Theory Courses		Practical Courses						
	Nos.	Credits	Nos.	Credits	Nos.	Credits	Nos.	Credits	
I	02	08	01	03	-	-	01	04	15
II	02	08	02	06	01	03	-	-	17
III	02	08	-	-	01	03	-	-	11
IV	02	08	01	10	01	03	-	-	21
V	-	-	-	-	03	09	-	-	09
VI	-	-	01	15	-	-	-	-	15
Total Credits									88

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HOD

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Introduction to Microcontroller

COURSE OBJECTIVE

- To introduce students with the architecture and operation of typical microprocessors and microcontrollers.
- To familiarize the students with the programming and interfacing of microprocessors and microcontrollers.
- To provide strong foundation for designing real world applications using microprocessors and microcontrollers.
- To understand the basic concepts of Embedded Systems and working of a general purpose 8-bit microprocessor operations.
- Analyze how to access Microcontroller ports

Syllabus

Module - 1

The 8051 Instruction Set

- Program Status Word
- Addressing Modes
- Arithmetic Instructions
- Logical Instructions
- Data Transfers
- External RAM
- Lookup Tables

Module - 2

Common Features Description Vectors and assignment

- 8051 Architecture Block Diagram
- Special Function Registers
- Oscillator and Clock Circuit
- CPU Timing
- Port Structures and Operation

Module - 3

Serial Interface

- Baud Rates
- Baud Rate Selection Table for UART
- Internal Baud Rate Generator (BRG)
- Using Timer 1 to Generate Baud Rates
- Using Timer 2 to Generate Baud Rates
- More About Mode 0

Module - 4

Framing Error Detection

- Automatic Address Recognition
- Multiprocessor Communications
- Broadcast Address
- Reset Addresses

Module - 5

UART Registers & Interrupts

- SCON Register
- T2CON Register
- PCON Register
- BDRCON Register
- How Interrupts Are Handled
- External Interrupts
- Response Time

COURSE OUTCOME

- At the end of the course the student will be able to:
- Be familiar with the composition, design, and implementation
- Be familiar with reading and understanding processor and component datasheets
- Be familiar with working on a team to create and apply microcontroller
- Be familiar with the basics of interfacing hardware and software
- Be exposed to history of embedded interfaces.

Processor: Atmel 8051 Microcontrollers

Course Duration: 45 Hours

Eligibility: III year Agriculture students

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R programming Syllabus

Module – 1

Introduction and preliminaries, organize scientific and technical data

- The R environment
- R and the window system
- R commands, case sensitivity, etc
- Executing commands from or diverting output to a file
- Data permanency and removing objects

Module – 2

Simple manipulations; numbers and vectors PID algorithms

- Vectors and assignment
- Vector arithmetic
- Generating regular sequences
- Logical vectors
- Character vectors
- Index vectors; selecting and modifying subsets of a data set

Module – 3

Arrays and matrices intrinsic attributes: mode and length

- Array indexing. Subsections of an array
- The array() function
- Generalized transpose of an array
- Matrix facilities
- Forming partitioned matrices, cbind() and rbind()
- The concatenation function, c(), with arrays
- Frequency tables from factors

Module – 4

Lists and data frames

- Constructing and modifying lists
- Data frames
- The read.table() function
- The scan() function
- Accessing builtin datasets
- Editing data

Module – 5

Grouping, loops and conditional execution

- Grouped expressions
- Named arguments and defaults
- Assignments within functions
- Analysis of variance and model comparison
- Generalized linear models
- The glm() function
- Some non-standard models

COURSE OUTCOME

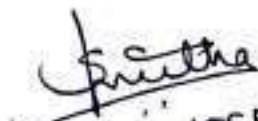
At the end of the course the student will be able to:


1. Do statistical analysis and data visualization
2. Analyze the results of experiments
3. Crunch the data gathered in pre-clinical trials

Software Used: R 4.3.1

Course Duration: 45 Hours:

Eligibility: II year ECE and EEE students


(HOD(ECE))


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 U/s 3 of UGC Act, 1956

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

ON INTRODUCTION TO LABVIEW

ABOUT THE INSTITUTION

Ponnaiyah Ramajayam Institute of Science and Technology (PRIST), a Deemed University (U/s 3 of the UGC Act 1956), is one of the renowned units of Ponnaiyah Ramajayam Institutions, which are serving for more than 25 years in promoting quality education and research for our Indian community, since its inception. The institution is now brimming with many social responsibilities, particularly in promoting quality education through research.

ABOUT THE DEPARTMENT

The department of Electronics and Communication Engineering came into existence in 2008 with an objective to impart quality education to meet today's competitive environment.

Department has well experienced and dedicated faculty with strong commitment to provide a vibrant learning environment to the students in order to help them excel. To keep pace with the current technological trends, the department has a well designed, constantly reviewed syllabus to incorporate all advancements in existing and emerging technologies which gives the students a holistic and pragmatic view of the present scenario of industry.

The Department has state-of-the-art laboratories, such as VLSI lab, Digital Image Processing Lab, Circuit Simulation Lab, Communication Lab, and higher end software like MATLAB, PSPICE, Xilinx, IAR, L-Sim & N-Sim.

The Department runs an undergraduate course in B. Tech - Electronics and Communication Engineering and postgraduate programme like M. Tech in Communication Systems. Department also offers part time programmes in B. Tech - Electronics and Communication Engineering and M. Tech - Communication Systems.

Introduction to LabView

LabVIEW is a graphical programming environment software that is optimized for engineers and scientists. Developed by National Instruments, this software uses a visual approach to programming and is a great program for beginner programmers. You can create visual charts like data flow charts and connect hardware created by NI and other vendors. The programming environment software is available for Apple Mac, Linux, and Microsoft Windows PC 32-bit and 64-bit operating systems. MATLAB is another programming environment that is similar to LabVIEW. MATLAB is geared toward numbers whereas LabVIEW focuses on visualizations. While MATLAB computes and processes data, LabVIEW gathers and tests information. Simulink is another alternative app that is created by MathWorks, the same developers of MATLAB. The Simulink user experience is more comparable to LabVIEW since diagrams are used in both applications.



COURSE OBJECTIVE

1. Use LabVIEW to create data acquisition, analysis and display operations.
2. Create user interfaces with charts, graph and buttons
3. Use the programming structures and data types that exist in LabVIEW
4. Use various editing and debugging techniques

Lab View Syllabus

Module - 1

Lab View over MATLAB

- Organize scientific and technical data
- Populate the data into flow charts
- Illustrative charts
- Control instruments and virtual instruments
- Hardware integration

Module - 2

Algorithms and languages used

- PID algorithms
- Add-on algorithms
- Graphical programming language called G
- Custom user interfaces
- Connector and Icon Pane

Module - 3

Navigating Labview

- Menus and tools
- Creating and using labview projects
- Labview front panel and block diagram
- Searching for controls, vis, and functions

Module - 4

Troubleshooting and Debugging

- Build a simple labview application Web Development
- Various debugging and error-checking techniques in labview
- Problems with block diagram organization
- Problems with data passing within a block diagram

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School Of Engineering And Technology
Department of ECE

MOBILE PHONE TECHNOLOGIES

Module 1 (Basic Electronics)

The first module will act as a bridging course for those students who do not have any prior knowledge about the field. For others, who already have prior knowledge about electrical and electronic engineering, this module will help them revise these concepts.

- Basic Electronics - Current, Voltage, AC Current & DC Current, Resistor, Transistor, Capacitor, Diode, Inductor / Coil, Transformer, Integrated Circuit
- Introduction to Digital Electronics
- Study of various Components (parts) inside a Mobile Phone
- Various Components of Mobile Phones
- Study on Components : Speaker / Ringer, Microphone, Vibrate Motor, Display, Drivers, Power Switch, Fuse, Real Time Clock and Quartz Crystal
- What is a Multimeter and How to use a Multimeter
- How to use DC Power Supply
- Use of Battery Booster
- Understanding Circuit Diagrams
- Study of Various Tools and Equipment used in Mobile Phone Repairs

Module 2 (Mobile Communication)

The second module introduces the student to mobile communication and the technology used. It gives an insight about the basic concepts of mobile communication and various technology standards used around the world, its advantages and disadvantages etc.

- Basics of Mobile Communication
- Introduction to Mobile Phone Technology
- Introduction to Working Principal of Mobile


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- Handoff
- Mobile Station
- Base Station Subsystem
- SIM (Subscriber Identification Module)
- Network and Switching Subsystem
- GSM (Global System for Mobile)
- Advantages of GSM Technology
- CDMA (Code Division Multiple Access)
- Advantages of CDMA Technology
- Introduction of GPRS (General Packet Radio Service)
- Frequency of 4G Bluetooth
- Wi-Fi
- Wi-max (Basic Concepts)

Module 3 (Circuits and Different Sections on Motherboard)

The third module introduces the students to various sections on the motherboard of a mobile phone device, its functions, uses and benefits for the mobile phone user

- Power Circuit
- Charging Circuit
- Light Circuit
- SIM Circuit
- Display Circuit
- Keypad Circuit
- Touch Screen Circuit
- Audio Circuit
- Memory card Circuit
- Speaker Circuit
- Microphone Circuit
- Vibrator Circuit
- Network Circuit
- Bluetooth Circuit
- Wifi Circuit

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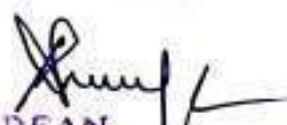
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Module 4 (Hardware Repair)

The fourth module focuses on hardware and teach the students how to handle and replace various electronic parts. It will help them to learn all the hardware repair procedures in a more comprehensive manner.

- Introduction and Study of Basic Circuit Board
- Motherboard Introduction
- Details of various components on the PCB
- Assembling & Disassembling of different Mobile Phones
- Soldering & De-soldering of Components by using a Soldering Iron
- Soldering & De-soldering of Components by using a Rework Station
- Reheating and Mounting of various BGA and SMD chips
- Ultrasonic Cleaning Procedure
- Names of Different IC's
- How to Identify various IC's
- Study of Different ICs (chips) used on the Motherboard
- Introduction to SMD Components and Testing SMD Components
- Working on SMD/ BGA ICs and the PCB
- BGA IC Re-Balling and Installing
- Installing and Removing Connector, Display flex, Folding and Sliding Handset Flex Cable
- Water Damage and Washing of Mobile Phone with CTC
- Testing of Various Parts and Components
- Circuit Tracing of Different Section of Mobile Phone
- Fault finding & Troubleshooting
- Jumpers and Jumpering Techniques
- Troubleshooting through Circuit Diagrams
- Repairing Procedure for different Hardware Faults
- Checking Shorting and Technique to Remove
- Hot and Cold Testing
- Voltage Tracing and different volts used in Mobile Phone
- Dead set Repairing

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Module 5 (Software Repair)

The fifth module focuses on software issues which are some of the most common ones faced by Smartphone users. Sometimes, a software problem can lead to hardware abnormalities as well. This module will teach you how to perform various software repairing techniques.

- Operating Systems
- 9 Different Types of Mobile Operating Systems
- Mobile Phone Applications
- Knowledge about IMEI, IMSI, ESN, PIN, PUK, MTSO, SECURITY LOCK, Default Codes of different Mobile Phones and Factory Resets
- Detailed study of various faults arising due to Corrupt Software
- Introduction of various flasher boxes and software
- Flashing of various brands of handsets
- Removing virus from infected phones
- Unlocking of handsets through codes and/or software
- Use of various secret codes
- FRP lock removal
- How to Flash Mobile with Flash File easily
- Pattern Lock Removal
- Unlock and Lock phone
- Mobile EMEI number Repairing
- Mobile repair with Miracle Box
- Mobile repair with Z3X Box
- How to download Mobile Flashing File, Driver, Mobile Application from the Internet
- Fault Finding & Troubleshooting

Module 6 (Basic and Advanced Troubleshooting)

After receiving a customer's complaint, it is important to understand where the problem of the phone lies - hardware or software; and then

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repair it accordingly. This is where the troubleshooting module will come in handy. This module will teach you how to troubleshoot the problems in a mobile phone almost like an experienced mobile phone repair technician.

- Fault finding, Troubleshooting and Repairing of various Faults
- Standard Repair Procedure for Hardware related Faults
- Standard Repair procedure for Software related Faults
- Water Damaged repair Techniques
- Circuit Tracing, Jumper Techniques and Solutions
- Troubleshooting through Schematic Diagrams
- Use of internet for Troubleshooting Faults
- Advanced Troubleshooting Techniques

Module 6 (Additional Learning)

To be a successful mobile phone repair technician, one needs to know more than just the technical aspects of fixing a phone. This module aims to teach some additional topics to help you become a better mobile phone repair engineer.

- Revision of Topics already covered in the previous modules
- Technical Guidance for starting and Managing your own Mobile Phone Service Center
- Guidance to Successfully work as a Mobile Phone Technician
- Procuring Tools, Equipments, Spare Parts and Accessories
- Business Ethics and Dealing with Customers
- Promoting your Mobile Phone Repair Business

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Dr. B.Chandrasekaran, M.Sc(Ag), Ph.D.,

F.(ISA), F.ISR(FOA, Rome), C.SRINM (IRRI), Prod. Advocate (APO, Japan)


Dean (Academic),

School of Agriculture

Date:16.05.2022

CIRCULAR

All the staff members are requested to attend the Board of Study Meeting scheduled on 18.05.2022(Wednesday) between 10.00 AM to 12.30 PM at Dean cabin. They are also kindly are requested not to apply for any kind of leave or permission or OD on the BOS meeting day.


Dean (Academic)

School of Agriculture



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SCHOOL OF AGRICULTURE

BOARD OF STUDIES MEETING 2022-2023

AGENDA

Date: 18.05.2022

S. No	Subject
Welcome Address	
1.	Welcome Address by the council chairman
Items for reporting to the Board of Studies Meeting	
2.	1. To consider the inclusion of add on and audit course in existing curriculum 2. To confirm the minutes of the pre board of studies meeting.



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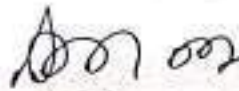

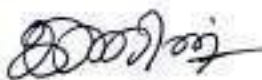
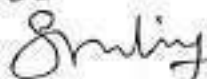

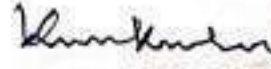
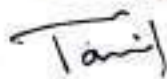



SCHOOL OF AGRICULTURE

MINUTES OF MEETING

The meeting board of studies in School of Agriculture was held on 18th May 2022
Wednesday at 10.00 am. Under the chairmanship of Dr. A. Sathiyavelu

The following members were present for the meeting

Name and Designation

1. Dr. A. Sathiyavelu
Professor, Member 
2. Dr. B. Chandrasekaran
Dean, Chairman 
3. Prof. N. Ilanchezhian
Professor, Member 
4. Dr. P. Selvaraj
Professor, Member 
5. Dr.A.Udayakumar
Professor , Member 
6. Dr. K. Kumarakuru
Associate Professor, Member 
7. Mr. S. Tamilcovane
Assistant Professor, Member 
8. Mrs. S.R.Rajam
Assistant Professor, Member 
9. Dr. A. Velayutham, Ph.D.,
Dean, Agricultural college and Research Institute, Eachangkottai, Thanjavur. 
Academic Expert – External Member
10. Mr. K. K. Magudapathi, M. Sc., (Agri)
Dunhills Phyto Herbs, 211, Velayuthasamy Complex, Muthur Road, Vellakoil, Tiruppur (
Industrial Expert – External Member

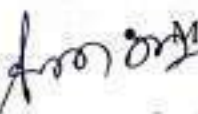
The Chairman, Board of Studies in the School of Agriculture welcomed the members and briefed about the existing curriculum and syllabus for B.Sc (Hons.) Agri programme.

The minutes of meeting are as follows

1. The department of academic council has suggested adding the value added course in the syllabus for the entrepreneurship development and introducing the emerging topics instead of old elective course and experiential learning. The board of study accept the above

2. The following courses are suggested by Dr. A. Velayutham, Dean, Agricultural college and research institute, Echankottai, Thanjavur for elective course and experiential learning.

- Edible mushroom cultivation
- Vermi technology
- Integrated farming system
- Environmental microbiology
- Aquaculture
- Bio composting
- Nano technology in agriculture
- Plant tissue culture
- Remote sensing
- Food security
- Soil hydrology
- Soil improvement by organic method
- Organic agriculture
- Smart farming
- Drone technology
- Bio inoculants
- Terrace gardening
- Aqua ponics with organic
- Aeroponics
- Industrial agro forestry
- Marine bio diversity



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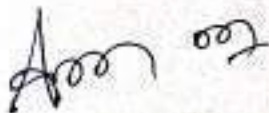
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- Small millets cultivation and value addition

The list of new value added course

List of new value added course:

- Certificate course on Commercial Bee Keeping
- Certificate course on Mushroom Cultivation
- Certificate course on Roof Garden



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LIST OF NEW COURSE (2022-2023)

S.NO	PROGRAMME NAME	COURSE CODE	COURSE
1	B.Sc. (Hons) Agriculture	18 OPT 201 A	Roof gardening
2	B.Sc. (Hons) Agriculture	18 OPT 201B	Digital faming
3	B.Sc. (Hons) Agriculture	18 OPT 201 C	Edible mushroom cultivation
4	B.Sc. (Hons) Agriculture	18 OPT 201 D	Vermi technology
5	B.Sc. (Hons) Agriculture	18 OPT 301A	Integrated farming system
6	B.Sc. (Hons) Agriculture	18 OPT 301B	Environmental microbiology
7	B.Sc. (Hons) Agriculture	18 OPT 301C	Aquaculture
8	B.Sc. (Hons) Agriculture	18 OPT 301 D	Bio inoculants
9	B.Sc. (Hons) Agriculture	18 OPT 302 A	Modern irrigation management
10	B.Sc. (Hons) Agriculture	18 OPT 302 B	Nano technology
11	B.Sc. (Hons) Agriculture	18 OPT 302 C	Plant tissue culture
12	B.Sc. (Hons) Agriculture	18 OPT 302 D	Remote sensing
13	B.Sc. (Hons) Agriculture	18 EXP 401/402	Food security
14	B.Sc. (Hons) Agriculture	18 EXP 401/402	Soil hydrology
15	B.Sc. (Hons) Agriculture	18 EXP 401/402	Soil improvement by organic method
16	B.Sc. (Hons) Agriculture	18 EXP 401/402	Smart farming
17	B.Sc. (Hons) Agriculture	18 EXP 401/402	Drone technology
18	B.Sc. (Hons) Agriculture	18 EXP 401/402	Terrace gardening
19	B.Sc. (Hons) Agriculture	18 EXP 401/402	Aquaponics
20	B.Sc. (Hons) Agriculture	18 EXP 401/402	Farm management
21	B.Sc. (Hons) Agriculture	18 EXP 401/402	Marine bio diversity
22	B.Sc. (Hons) Agriculture	18 EXP 401/402	Small millets cultivation with value addition
23	B.Sc. (Hons) Agriculture	18 EXP 401/402	Aeroponics
24	B.Sc. (Hons) Agriculture	18 EXP 401/402	Azolla cultivation

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Semester – wise distribution of courses

I Semester			Credit Hours
S. No.	Course Code	Course Title	
1	18 AGR 101	Fundamentals of Agronomy	3(2+1)
2	18 AGR 102	Agricultural Heritage*	1(1+0)
3	18 AGR 103	Introduction to Forestry	2(1+1)
4	18 AEX 101	Rural Sociology & Educational Psychology	2(2+0)
5	18 AEX 102	Human Values & Ethics (non gradial)	1(1+0)
6	18 GPB 101	Introductory Biology	2(1+1)
7	18 HOR 101	Fundamentals of Horticulture	2(1+1)
8	18 SAC 101	Fundamentals of Soil Science	3(2+1)
9	18 BIC 101	Fundamentals of Plant Biochemistry and Biotechnology	3(2+1)
10	18 ENG 101	Comprehension & Communication Skills in English	2(1+1)
11	18 NSS / NCC 101	NSS/NCC/Physical Education & Yoga Practices	2(0+2)
Total			23(14+9)

II Semester			Credit Hours
S. No.	Course Code	Course Title	
1	18 AGR 104	Introductory Agro-meteorology & Climate Change	2(1+1)
2	18 AEC 101	Fundamentals of Agricultural Economics	2(2+0)
3	18 AEN 101	Fundamentals of Entomology	3(2+1)
4	18 AEX 103	Fundamentals of Agricultural Extension Education	3(2+1)
5	18 AGM 101	Agricultural Microbiology	2(1+1)
6	18 GPB 102	Fundamentals of Genetics	3(2+1)
7	18 CRP 101	Fundamentals of Crop Physiology	2(1+1)
8	18 PAT 101	Fundamentals of Plant Pathology	3(2+1)
9	18 SWE 101	Soil and Water Conservation Engineering	2(1+1)
Total			22(14+8)

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III Semester

S. No.	Course Code	Course Title	Credit Hours
1	18 AGR 201	Crop Production Technology - I (Kharif Crops)	2(1+1)
2	18 AGR 202	Education of Tour	1(0+1)
3	18 AEC 201	Agricultural Finance and Co-operation	2(1+1)
4	18 AMP 201	Livestock and Poultry Management	3(2+1)
5	18 ENS 201	Environmental Studies and Disaster Management	3(2+1)
6	18 FMP 201	Farm Machinery and Power	2(1+1)
7	18 GPB 201	Fundamentals of Plant Breeding	3(2+1)
8	18 HOR 201	Production Technology for Vegetables and Spices	2(1+1)
9	18 COM 201	Agro-Informatics	2(1+1)
10	18 MAT 201	Statistical Methods	2(1+1)
11	18 AGR 203	Farming System & Sustainable Agriculture	1(1+0)
Total			23(13+10)

IV Semester

S. No.	Course Code	Course Title	Credit Hours
1	18 AGR 204	Crop Production Technology - II (Rabi Crops)	2(1+1)
2	18 AGR 205	Irrigation Water Management	2(1+1)
3	18 AEC 202	Agricultural Marketing Trade & Prices	3(2+1)
4	18 AEX 201	Communication Skills and Personality Development	2(1+1)
5	18 ERG 211	Renewable Energy and Green Technology	2(1+1)
6	18 HOR 202	Production Technology for Fruit and Plantation Crops	2(1+1)
7	18 PAT 201	Principles of Integrated Pest and Disease Management	2(1+1)
8	18 SAC 201	Problematic Soils and their Management	2(1+1)
9	18 SST 201	Principles of Seed Technology	3(2+1)
10	18 OPT 201	Elective Course	3(2+1)
Total			23(13+10)

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V Semester

S. No.	Course Code	Course Title	Credit Hours
1	18 GPB 301	Crop Improvement - I (Kharif Crops)	2(1+1)
2	18 AGR 301	Rainfed Agriculture & Watershed Management	2(1+1)
3	18 AGR 302	Practical Crop Production - I (Kharif Crops)	2(1+1)
4	18 AEN 301	Pests of Crops and Stored Grain and their Management - I	3(2+1)
5	18 AEX 301	Entrepreneurship Development and Business Communication	2(1+1)
6	18 HOR 301	Production Technology for Ornamental Crops, MAP and Landscaping	2(1+1)
7	18 PAT 302	Diseases of Field and Horticultural Crops and their Management - I	3(2+1)
8	18 SAC 301	Manures, Fertilizers and Soil Fertility Management	3(2+1)
9	18 IPR 301	Intellectual Property Rights	1(1+0)
10	18 OPT301	Elective Course	3(2+1)
Total			23(14+9)

VI Semester

S. No.	Course Code	Course Title	Credit Hours
1	18 AGR 303	Geoinformatics and Nano-technology and Precision Farming	2(1+1)
2	18 GPB 302	Crop Improvement - II (Rabi Crops)	2(1+1)
3	18 AGR 304	Practical Crop Production - II (Rabi Crops)	2(1+1)
4	18 AGR 305	Principles of Organic Farming	2(1+1)
5	18 AEC 301	Farm Management, Production & Resource Economics	2(1+1)
6	18 AEN 302	Pest of Horticulture Crops and Management of Beneficial Insects	2(1+1)
7	18 FSN 301	Principles of Food Science and Nutrition	2(2+0)
8	18 HOR 302	Post-Harvest Management and Value Addition of Fruits and Vegetable	2(1+1)
9	18 PAT 302	Diseases of Field and Horticultural Crops and their Management - II	2(1+1)
10	18 PCA 301	Protected Cultivation and Secondary Agriculture	2(1+1)
11	18 OPT 302	Elective Course	3(2+1)
Total			23(13+10)

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VII Semester

VII Semester

Rural Agricultural Work Experience and Agro-industrial Attachment (RAW & AIA)

No.	Course Code	Rural Agricultural Work Experience and Agro-industrial Attachment (RAW & AIA)		
		Activities	No. of weeks	Credit Hours
1	18 AEX 401	General orientation & On campus training by different faculties	1	14
		Village attachment	8	
		Unit attachment in Univ/ College, KVK/ Research Station Attachment	5	
		Plant clinic	2	02
		Agro-Industrial Attachment	3	04
	18 PRJ 401	Project Report Preparation, Presentation and Evaluation	1	02
Total weeks for RAW & AIA			22	22

- **Agro-Industrial Attachment:** The students would be attached with the agro-industries for a period of 3 weeks to get an experience of the industrial environment and working.
- Educational tour will be conducted in break between IV & V Semester or VI & VII Semester

RAW Component-I

Village Attachment Training Programme

Sl. No.	Activity	Duration
1	Orientation and Survey of Village	1 week
2	Agronomical Interventions	1 week
3	Plant Protection Interventions	1 week
4	Soil Improvement Interventions (Soil sampling and testing)	1 week
5	Fruit and Vegetable production interventions	1 week
6	Food Processing and Storage interventions	
7	Animal Production Interventions	1 week
8	Extension and Transfer of Technology activities	1 week

RAW Component-II

Agro Industrial Attachment

- Students shall be placed in Agro-and Cottage industries and Commodities Boards for 03 weeks.
- Industries include Seed/Sapling production, Pesticides-insecticides, Post harvest-processing-value addition, Agri-finance institutions, etc.

Activities and Tasks during Agro-Industrial Attachment Programme

- Acquaintance with industry and staff
- Study of structure, functioning, objective and mandates of the industry
- Study of various processing units and hands-on trainings under supervision of industry staff
- Ethics of industry
- Employment generated by the industry
- Contribution of the industry promoting environment
- Learning business network including outlets of the industry
- Skill development in all crucial tasks of the industry
- Documentation of the activities and task performed by the students

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- Documentation of the activities and task performed by the students
 - Performance evaluation, appraisal and ranking of students
- Modules for Skill Development and Entrepreneurship:** A student has to register 20 credits opting for two modules of (0+10) credits each (total 20 credits) from the package of modules in the VIII Semester.

VIII Semester

No.	Course Code	Course Title	Credit Hours
1	18 EXP 401	Experiential Learning - Module I	0+10
2	18 EXP 402	Experiential Learning - Module II	0+10

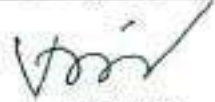
Experiential Learning: A student can select two experiential learning out of the following and offer during 8th semester.

S. No.	Title of the module	Credits
1	Roof gardening	0+10
2	Digital farming	0+10
3	Edible mushroom cultivation	0+10
4	Vermi technology	0+10
5	Integrated farming system	0+10
6	Environmental microbiology	0+10
7	Aquaculture	0+10
8	Bio inoculants	0+10
9	Modern irrigation management	0+10
10	Nano technology in agriculture	0+10
11	Plant tissue culture	0+10
12	Remote sensing	0+10

Elective Courses: A student can select three elective courses out of the following and offer during 4th, 5th and 6th semesters.

S. No.	Courses	Credit Hours
1	Food security	3(2+1)
2	Soil hydrology	3(2+1)
3	Soil improvement by organic method	3(1+2)
4	Smart farming	3(2+1)
5	Drone technology	3(2+1)
6	Terrace gardening	3(2+1)
7	Aquaponics with organic	3(2+1)
8	Aeroponics	3(1+2)
9	Farm management	3(2+1)
10	Marine bio diversity	3(2+1)
11	Small millets cultivation with value addition	3(2+1)
12	Azolla cultivation	3(2+1)


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18 OPT 201D- Vermi technology

Definition, Habitat of vermicomposting earthworms, Scientific names of native and exotic vermicomposting earthworms (Native Indian earthworms: *Perionyx excavatus*, *Perionyx ceylanensis*, European earthworms: *Eisenia fetida*, *Etsemaandrei*, South African earthworms. *Eudriluseugeniae*), Selective features of earthworm species for vermicomposting Principle of vermicomposting, Components of the vermicomposting system (Appropriate species of earthworms with suitable population characteristics, proper substrate, optimum environmental factors under Indian condition, Design and operations to be implemented) Methods of vermicomposting (a) Low cost floor beds, (b) Tank system; Management during vermicomposting, Products of vermicomposting earthworm biomass (vermi-protein) and vermicompost Definition of vermicompost, Physicochemical features of vermicompost, Role of earthworm and vermicompost in growth of plants, Vermiwash and its utility in agriculture.

18 OPT 201C - Edible mushroom cultivation

UNIT-I :Edible and non-edible mushroom (Historical account, most commonly cultivated mushrooms in the world, distribution and production in various countries).

UNIT-II :Mushroom cultivation- Cultivation practices - pure culture, composts and their preparation,

Preparation of compost & cultivation of *Agaricus bisporus*, *Pleurotus flabellatus*, harvest.

UNIT-III : Pure culture of mushrooms and their nutritional requirements. Definition of spawn, substrate for spawn, types of spawn, methods of spawn production, characteristic of a good spawn, storage of spawn.

UNIT-IV :Pests and diseases of Edible mushrooms (Environmental, fungal, bacterial, viral, insect

pests and Nematode diseases and competitor moulds Economics of mushroom cultivation.

UNIT-V: Precautions in mushroom cultivation (precaution to be taken while selecting the area, spawn

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preparation, spawn run, during cropping harvesting etc

18 OPT 302C- Plant tissue culture

UNIT-I

History of plant tissue culture, Laboratory set up Basic principles of plant tissue stock preparation,

callus culture. Totipotency of cells, differentiation, dedifferentiation and redifferentiation

UNIT-II

Methodology Sterilization (physical and chemical methods) Plant cell culture methods, Culture media, Media and their types, Phytohormones. MS and BS

UNIT-III

Callus induction sub culture, metabolic patterns in callus culture, Morphogenesis in callus culture

UNIT-IV

Endosperm culture media requirements, morphogenetic potential application Embryo culture culture

requirements applications

UNIT-V

Tissue culture and crop improvement Agrobacterium mediated gene transfer technology

18 OPT 301B -Environmental microbiology

Unit 1: Plant Growth Promotory Rhizobacteria and their metabolites. Mechanism of action for biotic and abiotic stress management. Biological Nitrogen Fixation, Biochemistry of

nitrogen assimilation and transport physiological aspects of

nitrogen fixation, nodulation-early and late events, molecular biology of nitrogenase activity

Unit II: Biofertilizers history of biofertilizers, sources of nitrogen and the importance of biofertilizers, description and characteristics of biofertilizers-Rhizobium, Azotobacter, Azospirillum, Blue Green Algae, Azolla, Phosphate solubilizing microorganisms, VAM) Biofertilizer production technology-strain selection, sterilization, growth and fermentation, standards and quality control, biofertilizer application technology, constraints in the commercialization of biofertilizer technology

Unit III: Microbial services in green house gases mitigation, natural resource management and restoration ecology. Microbial ecology of green house gas (methane) producing and consuming bacteria from different ecosystems. Impact of different environmental drivers on ecologically beneficial microbial community and their biomass, Beneficial microbial services in wasteland reclamation and restoration of marginal lands. Microbial biomass as soil fertility index of different agriculture and forest ecosystems.

Unit-IV: Influence of land use change (LUC) on ecosystem services and agro-environmental sustainability.

18 OPT 301C - Aquaculture

Unit I Current status, problems and prospects of coastal aquaculture and seed resources.

Unit II Broodstock management: availability, collection, transport, captive rearing, maturation.

Nutritional requirements of fishes (cobia, grouper, pompano, seabass, milkfish, mullets, pearlspot) and shellfishes (shrimps, crabs, lobsters, mussels and oysters).

Unit III Hatchery technology and management (cobia, grouper, pompano, seabass, milkfish, mullets, pearlspot, shrimps, crabs, lobsters, mussel & oysters).

Unit IV Culture practices of selected finfishes and shellfishes:

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to financing agriculture, enabled by or integrated with ICT, including mobile financial services, branchless banking, ATMs, and smartcards. While the digital revolution is reaching rural areas in many developing countries, the rural-urban digital divide remains, and rural women face a triple divide: digital, rural, and gender. This module looks at the benefits of ICT when placed in the hands of men and women working in agriculture and rural areas. It examines the challenges that must be overcome and provides recommendations for rural communities to take full and equal advantage of ICT

Unit 4: Strengthening Agricultural Market Access with ICT and Digital Tools

Farmers use mobile phones to build a network of contacts and draw on this wider expertise to obtain critical information more rapidly. The mobile phone, its special applications, and the Internet are essentially becoming management tools for farmers, especially in relation to market intelligence. Greater access to information helps farmers make better decisions about transportation and logistics, price and location, supply and demand, diversification of their product base, and access to inputs. ICT also facilitates market research, increasingly using live information. This market information strengthens farmers' position in their day-to-day trading. Over time, market intelligence enables them to focus on satisfying consumers' and buyers' demands and on developing relationships with stakeholders in the next stage of the value chain. The key development challenge lies in assembling and disseminating this information in a timely manner, not just to traders or larger-scale farmers but also to smallholders.

Unit 5: Using ICT for Remote Sensing, Crowdsourcing, and Big Data

This module consists of three sections. (1) Remote sensing, (2) Crowdsourcing and crowd mapping, and (3) Big data for analytics


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18 EXP 401 & 402- Azolla cultivation

Unit-I :AZOLLA CULTIVATION : Definition and Historical development of Azolla production.

Economic importance of Azolla.

Unit-II: Azolla as biofertilizer, Nutritional values and composition of Azolla sp. Pit preparation for Azolla cultivation

Unit-III: Mass cultivation of Azolla, Requirements for the Growth of Azolla, factors affecting Azolla growth

Unit-IV: Composition of Media for Azolla production, Types of Azollasp

Unit- V: Production of Azolla in small scale and large scale. Harvesting, marketing and its uses in Azolla.


18 EXP 401 & 402- Aqauponics

Introduction and overview Aquaponics - Aquaponic Systems and maintenance- Aquaponics and its management- Practical component

18EXP 401 & 402- Farm management

Introduction- Strategic Planning - Review of interrelationship between financial statements and cash flow projections - Optimal Capital Structure and Financial Leverage- Linear Programming - Risk Management- Ownership Transfer- Emergency Procedures


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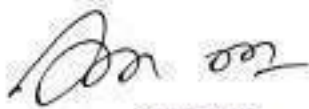

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18 EXP 401 & 402- Terrace gardening

Introduction to terrace gardening- containers selection and soil preparation- plant selection and care – watering and fertilizing techniques- pest and disease management

18 EXP 401 & 402- Smart farming

Introduction to climate smart agriculture- climate smart crop production-climate smart livestock production- climate smart soil land management -water management – for climate smart agriculture –
climate smart fisheries and aquaculture- climate smart forestry.



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VALUE ADDED COURSE SYLLABUS

COMMERCIAL BEE KEEPING

Unit 1: Honey bee species, castes, social biology and communication in honey bees - Bee pasturage and preparation of bee floral calendar Honey bees for crop pollination and seed production.

Unit 2: Stingless bees, little bees, rock bees conservation and honey harvest - Beehives, beekeeping equipments specification and uses, visit to manufacturing unit - Hiving feral Indian bee colony, site selection for apiary, visit to migratory bee keeping sites, visit to commercial cerana bee farm

Unit 3: Honey extraction, processing, purity testing and value addition, visit to honey processing unit-Hive inspection, maintenance of hive records, management in nectar flow season, dearth period, management of swarming, absconding and Jaying workers - Dividing, uniting bee colonies, artificial feeding, protecting bees from om pesticides - Insect, mite and bird enemies of honeybees, brood and adult diseases

Unit 4: Mass queen rearing and production of mating nucleus, visit to beekeeping society - Methods of collection of bees wax, bee pollen, propolis, bee venom, royal jelly - Visit to commercial mellifera bee farm

Unit 5:- Marketing and economics of honey and bee products, preparation of bee keeping projects for bank funding

MUSHROOM CULTIVATION

UNIT 1: Different types of mushroom, Morphology Edible and poisonous type edible mushrooms-Pleurotus, Agaricus, Volvariella and Calocybe nutritional values and pharmacological values-preparation of culture media pure culture techniques- sterilizing techniques-media - glassware - maintenance of culture

Unit 2: Mother spawn production-type of spawn-Multiplication of bed spawn - Substrates for mushroom cultivation and their preparation -mushroom cultivation techniques for Agaricus, Pleurotus, Calocybe and Volvariella maintenance of spawn running and cropping room- harvestpacking and storage of Pleurotus, Agaricus and Calocybe.

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Unit 3: Problems in cultivation of Agaricus, Pleurotus, Calocybe and Volvariella pests, diseases and weed moulds, abiotic disorders - management strategies - Biodegradation of coirpith - estimation

Unit 4: Post harvest technology of Agaricus, Pleurotus, Calocybe and Volvariella - methods of preservation -Drying: solar, cabinet, fluidized bed and freeze drying Packing methods and storage Controlled atmospheric storage modified atmospheric storage and canning - Cost analysis.

Unit 5: Mushroom recipes of Agaricus, Pleurotus, Calocybe and Volvariella Cooking methods value added products - instant food mixes-Cost analysis. Project preparation- principles of mushroom farm enterprise management-cost estimation

KITCHEN GARDEN

Unit I: characteristics of kitchen garden -

Vegetable occupy an important place in our daily life particularly for vegetarians. Vegetables are the only source to increase not only the nutritive values of foods but also its palatability

Unit II: Kitchen Garden Site Selection- There will be limited choice for the selection of sites for kitchen gardens. The final choice is usually the backyard of the house.

Unit III : Land preparation- Firstly a through spade digging is made to a depth of 30-40 cm. stones, bushes and perennial weeds are removed.

Unit VI : Sowing and planting - Seeds of transplanted crops like tomato, Brinjal and Chilli can be sown in nursery beds or pots one month in advance by drawing lines.

Unit V : Harvesting

AGRI TOURISM

Unit I: Agritourism - as part of rural development and tourism. Definition and forms. Strengths and weaknesses.

Unit II: Business projects - their content and development. Economic and environmental aspects of agritourism.

Unit III: Characteristics of quality and their grant.

Unit IV: Field exercises in agro-tourism farms and facilities.

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Unit V: Excursion on the international exhibition focusing on tourism, rural tourism and agritourism.

POST HARVEST TECHNOLOGY

Unit I: Post harvest technology of vegetable crops

Unit II: Post harvest technology of fruit crops

Unit III: Value addition flowers

Unit IV: Processing of plantation crop, spices, Medicinal plants and aromatic plants

NON CHEMICAL FARMING

Unit 1: Introduction (Definition of organic farming and an Overview of organic farming) Systems Concept/Theory (Components, interactions, structures, hierarchies)

Unit II: Initiatives taken by the central and state governments, NGOs and other organizations for promotion of organic agriculture in India. Organic nutrient sources and their fortification organic manures- methods of composting

Unit III: Nutrient use in organic farming-scope and limitations. Nutrient management inorganic farming. Organic ecosystem and their concepts

Unit IV: Fundamentals of insect, disease and weed management under organic mode of production-cultural-biological methods-non chemical pest & disease management. Botanicals pyrethrum, neem seed kernel extract, neem seed powder, soluble neem formulations, neem oil

Unit V: Inspection certification labelling and accreditation procedures for organic products. Processing - economic consideration and viability. Marketing and export potential of organic products-national economy

ROOF GARDENING

Unit 1: Introduction- Understand the role of a Rooftop Gardener Familiarize with the scope and importance of gardening/rooftop gardening Develop basic aesthetic sense of gardening

Unit 2: Design Rooftop garden- Interpret and implement the common design principles used in designing the rooftop garden. Explain the different factors to be considered for the layout of the

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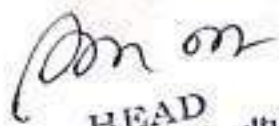
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rooftop garden Make use of rooftop garden accessories and designer pots/containers as per the availability of space Demonstrate pot gardening or container gardening Identify ideal plants, shrubs, seasonal flowers, climbers etc. for rooftop gardening (apt root and shoot growth). Prepare appropriate soil mixture or growing medium for rooftop plants.

Unit 3: Grow and maintain the condition of plants- Grow, propagate and ensure maintenance of the plants. Undertake potting and repotting operations. Undertake bonsai planting. Follow the standard procedures of timely training, pruning, removing the dead and old parts of the plants for their healthy growth and improved quality.

Unit 4: Use and maintain the gardening tools, containers and other equipment- Identify different garden tools and equipment and their uses to be used in roof top gardens. Ensure proper use and cleanliness of various hand tools. Identify ideal type of containers from available options as per the requirement of plant and aesthetic sense Ensure correct handling of containers used for roof gardens

Unit 5: Monitor the plants and identify any potential damage- Identify common types of plant pest and diseases Ensure appropriate precautionary and corrective measures to spread and



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THANJAVUR - 613 403 - TAMILNADU

SCHOOL OF COMMERCE AND BUSINESS MANAGEMENT

DEPARTMENT OF COMMERCE

MINUTES OF BOARD OF STUDIES MEETING

2022-2023

The Board Of Studies Meeting For The Department Of Commerce Is Held On 06.05.2022 At 10.Am.In MBA (PSB) BLOCK ,Prist Deemed To Be University ,Thanjavur Under The (Dr.S.Rajendran Chairman ,Bos)

The Following Members Were Present:

- Dr.S.Rajendran(Chairperson/HoD / Bos Member)
- Dr.R.Saminathan (External Expert-Academic / Bos Member)
- CA. S. Venkataraman (External Expert- Industry// Bos Member)
- Dr.R.Selvaraj (Professor/Bos Member)
- Dr.S.Kamaraaju (Professor / Bos Member)
- Dr.G.Karthiga (Associate Professor / Bos Member)
- Dr. V.Sridevi(Associate Professor/ Bos Member)
- Dr.R.Rajavardhini (Assistant Professor/ Bos Member)
- Dr.D.Silambarasan (Assistant Professor/ Bos Member)
- K.Saitya (Special Invitee-Dean/ Bos Member)
- M.Revathi (Special Invitee-Alumnus/Alumna)
- S.Kaviya (Special Invitee -Current student)

The Chairman (Bos) Welcomed All The Members And Presented The Feedbacks About Existing Curriculum Received From Various Stake Holders And Also From The Department Academic Advisory Committee.

The Members Of The Board Have Unanimously Discussed And Carefully Revolved The Existing Syllabus For B. Com,B.Com Ca ,M.Com,M.Phil,In Details And Made The Necessary No Changes In (B.Com., B.Com Ca.,M.Com.,MPhil).

Department of Commerce
Ponnaiyah Ramjeevan Institute of
Science & Technology (PRIST),
Deemed as DEEMED TO BE UNIVERSITY

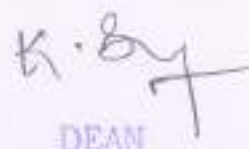
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There Were Introduce The Following Discipline Specific Elective Courses :

NAME OF THE PROGRAMME	NAME OF THE COURSE	COURSE CODE	YEAR OF INTRODUCTION
B. Com	Indian Economy	20161DSC55C	2022
B. Com	Business Mathematics	20161DSC55D	2022
B. Com	Consumer Protection and Consumer Rights	20161DSC55E	2022
B. Com	Merchant Banking	20161DSC55F	2022
B. Com	E-Commerce and its Applications	20161DSC64C	2022
B. Com	Industrial Organization	20161DSC64D	2022
B. Com	Practical Auditing	20161DSC64E	2022
B. Com	Industrial Relation	20161DSC64F	2022
B.Com CA	Portfolio Management	20198DSC55C	2022
B.Com CA	International Marketing	20198DSC55D	2022
B.Com CA	Rural Economics	20198DSC55E	2022
B.Com CA	International Economics	20198DSC55F	2022
B.Com CA	Management Principles and Applications	20198DSC64C	2022
B.Com CA	Computerized Accounting System	20198DSC64D	2022
B.Com CA	Business Tax Procedures and Management	20198DSC64E	2022
B.Com CA	Fundamentals of Investment	20198DSC64F	2022
M. Com	Consumer Affairs and Customer Care	20261DSC15C	2022
M. Com	Financial Market	20261DSC15D	2022
M. Com	Information Technology in Business	20261DSC25D	2022
M. Com	Macro and Indian Economy	20261DSC25D	2022
M. Com	GST and Indirect Taxes	20261DSC34C	2022
M. Com	Communication in Management	20261DSC34D	2022
M. Com	Indirect Tax Law	20261DSC44C	2022
M. Com	Principles of Micro Economics	20261DSC44D	2022



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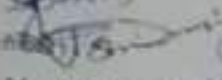
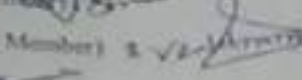


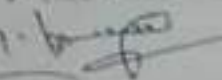
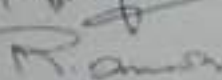
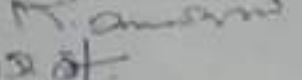
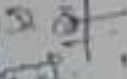






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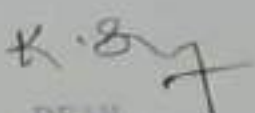
The Following Value Added New Diploma and Certificate Course (2022-2023)

S NO	COURSE TITLE	COURSE CODE
1	Diploma in Event Management	
2	Certificate Course in Intellectual Property Rights	22611EM
3	Certificate Course in Mutual Fund Operations	22611PR
4	Certificate Course in E-Filing of Income Tax(DRT&TDS)	22611MF
5	Certificate Course in Life Skills for Youth	22611ET
6	Certificate Course Preparatory for NIELIT Examination	22611NSI

The Following Members And chairman signature:

- Dr. S. Rajasekhar (Chairperson/HoD / Bos Member) 
- Dr. B. Srinivasan (External Expert-Academic / Bos Member) 
- CA. S. Venkateshwar (External Expert-Industry / Bos Member) 
- Dr. B. Subramanyam (Professor/Bos Member) 
- Dr. S. Kamath (Professor / Bos Member) 
- Dr. G. Karthiga (Associate Professor / Bos Member) 
- Dr. V. Sri Devi (Associate Professor / Bos Member) 
- Dr. B. Rajasekhar (Assistant Professor / Bos Member) 
- Dr. D. S. Srinivasan (Assistant Professor / Bos Member) 
- K. Sathya (Special Invitee-Dean / Bos Member) 
- M. Revathi (Special Invitee-Alumna/Alumnus) 
- S. Kavitha (Special Invitee -Current student) 


 HO/D,
 Department of Commerce
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 Coimbatore-641 027

SCHOOL OF COMMECRE AND BUSINESS MANAGEMENT

DEPARTMENT OF COMMERCEB.Com., -

REGULATION 2020

COURSE STRUCTURE

SEMESTER - I

Course Code	Course Title	L	T	P	C
THEORY					
20110AEC11/ 20111AEC11/ 20132AEC11/ 20135AEC11	Tami- I/Advanced English-I/Hindi-I/ French -I	4	0	0	2
20111AEC12	English-I	4	0	0	2
20161SEC13	Basic Accounting	4	1	0	4
20161SEC14	Business Environment	3	1	0	3s
20161AEC15	Marketing	3	0	0	3
20161AEC16	Business Economics	3	1	3	3
	Total	21	3	3	17
AUDIT COURSE					
201LSCIC	Indian Constitution	-	-	-	2
201LSCUV	Universal Human Values	-	-	-	2

SEMESTER - II

Course Code	Course Title	L	T	P	C
THEORY					
20110AEC21/ 20111AEC21/ 20132AEC21/ 20135AEC21	Tamil - II/ Advanced English-II/Hindi-II/ French - II	4	0	0	2

2011AEC22	English-II	4	0	0	2
20161SEC23	Business Accounting	4	1	1	4

20161SEC24	Ethics in Business	3	1	1	3
20161AEC25	Business Statistics	3	1	1	3
20161SEC26	Business Organization and Management	3	0	0	3
RESEARCH SKILL BASED COURSE					
20161RLC27	Research Led Seminar	-	-	-	1
	Total	21	3	3	18
AUDIT COURSES					
201LSCCS	Communication Skills	-	-	-	2
201SSCBE	Basic Behavioral Etiquette	-	-	-	2

SEMESTER – III

Course Code	Course Title	L	T	P	C
THEORY					
20110AEC31/ 20132AEC31/ 20111AEC31/ 20135AEC31	Tamil – III/Hindi-III/Advanced English-III/ French – III	4	0	0	2
20111AEC32	English-III	4	0	0	2
20161SEC33	Cost Accounting	2	1	2	4
20161SEC34	Banking Theory Law and Practice	2	1	1	3
20161AEC35	Business Law for Managers	2	0	2	3
20161AEC36	Essential of Business Communication	2	0	1	3
RESEARCH SKILL BASED COURSE					
20161RMC37	Research Methodology	2	0	0	2
	Total	18	2	6	19
AUDIT COURSE					
2011LSCOA	Office Automation	-	-	-	2

SEMESTER – IV

Course Code	Course Title	L	T	P	C
THEORY					
20110AEC41/ 20111AEC41/ 20132AEC41/ 19135AEC41	Tamil-IV/Advanced English-IV /Hindi-IV/ French – IV	4	0	0	2
20111AEC42	English-IV	4	0	0	2
20161SEC43	Partnership Account	3	1	2	4
20161SEC44	Advertising and Sales Promotion	3	1	1	3
201ENSTU45	Environmental Studies	2	0	1	3
20161AEC46	Company Law and Secretarial Practice	3	0	1	3
20161AEC47	Office Management	3	0	1	2
	Total	19	2	6	19
AUDIT COURSE					
201LSCLS	Leadership and Management Skills	-	-	-	2
201SSCAQ	General Aptitude and Quantitative Ability				2

SEMESTER - V

Course Code	Course Title	L	T	P	C
THEORY					
20161SEC51	Corporate Accounting	4	1	2	4
20161SEC52	Financial Management	3	1	1	4
20161SEC53	Financial Services	3	1	1	4
20161SEC54	Computer Application in Business	3	1	1	4
20161DSC55-	Discipline Specific Elective -I	3	0	1	2
RESEARCH SKILL BASED COURSE					
20161BRC57	Participation in Bounded Research	-	-	-	1
	Total	16	4	6	19
AUDIT COURSE					
201ACLSPSL	Professional Skills	-	-	-	2

SEMESTER - VI

Course Code	Course Title	L	T	P	C
THEORY					
20161SEC61	Management Accounting	3	1	2	5
20161SEC62	Entrepreneurship and Small Business Management	3	1	1	5
20161SEC63	Auditing	3	1	1	4
20161DSC64--	Discipline Specific Elective - II	3	0	2	2
201__OEC(2 Digit Course Name)	Open Elective	4	0	0	2
20161PRW66	Project Work	-	-	-	4
20161PROEE	Program Exit Examination	-	-	-	1
	Total	16	3	6	23
AUDIT COURSE					
201SSCIM	Interview Skills Training and Mock Test	-	-	-	2
201LSCCE	Community Engagement	-	-	-	1
201TERP9	Tally ERP	-	-	-	2
Total Credits -Programme					116
Total Credits - Audit Courses					21

DISCIPLINE SPECIFIC ELECTIVE

SEMESTER	COURSE CODE	COURSE TITLE
V	20161DSC55A	Stock Exchange Practice
	20161DSC55B	Cooperative Law and Practice
	20161DSC55C	Indian Economy
	20161DSC55D	Business Mathematics
	20161DSC55E	Consumer Protection and Consumer Rights
	20161DSC55F	Merchant Banking
VI	20161DSC64A	Income Tax Law and Practice
	20161DSC64B	Co-Operation Theory
	20161DSC64C	E-Commerce and its Applications
	20161DSC64D	Industrial Organization
	20161DSC64E	Practical Auditing
	20161DSC64F	Industrial Relation

OPEN ELECTIVE

SEMESTER	COURSE CODE	COURSE TITLE
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VI	201TAOEC 201ENOEC 201MAOEC 201PHOEC 201CHOEC 201MBOEC 201CSOEC 201CAOEC	Tamil Ilakkiya Varalaru Journalism Development of Mathematical Skills Instrumentation Food and Adulteration Wild Life Conservation Web Technology E-Learning
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B.COM CREDIT DISTRIBUTION

Sem	AEC	SEC	DSC	OEC	Research	Others	Total
I	10	06	-	-	-	01	17
II	10	07	-	-	01	-	18
III	10	07	-	-	02	-	19
IV	09	07	-	-	-	03	19
V	-	16	02	-	01	-	19
VI	-	16	02	02	-	03	23
Total	39	59	04	02	04	07	115


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 THANJAVUR-613 403.



SCHOOL OF COMMERCE AND BUSINESS MANAGEMENT
DEPARTMENT OF COMMERCE

B.Com, COMPUTER APPLICATION- REGULATION

2020 COURSE STRUCTURE

SEMESTER-I

Course Code	Course Title	L	T	P	C
THEORY					
20110AEC11/ 20111AEC11/ 20132AEC11/ 20135AEC11	Tami- I/Advanced English-I/Hindi-I/ French-I	4	0	0	2
20111AEC12	English-I	4	0	0	2
20198SEC13	Financial Accounting	4	1	1	4
20198SEC14	Business Management	3	1	1	3
20198AEC15	Information Technology	3	1	1	4
20198AEC16	Operating System	3	0	0	2
Total		21	3	3	17
AUDIT COURSE					
201LSCIC	Indian Constitution	-	-	-	2
201LSCUV	Universal Human Values	-	-	-	2

SEMESTER-II

Course Code	Course Title	L	T	P	C
THEORY					
20110AEC21/ 20111AEC21/ 20132AEC21/ 20135AEC21	Tamil-II/Advanced English-II/Hindi-II/ French-II	4	0	0	2
20111AEC22	English-II	4	0	0	2
20198SEC23	Business Accounting	5	1	0	4
20198AEC24	Business Law	4	1	0	4
20198AEC25	Programming in C	4	1	0	4
PRACTICAL					
20198SEC26L	Programming in CLab	0	0	3	2
RESEARCH SKILL BASED COURSE					
1					
20198RLC27	Research Led Seminar	-	-	-	1
Total		21	3	3	18
AUDIT COURSES					
201LSCCS	Communication Skills	-	-	-	2
201SSCBE	Basic Behavioral Etiquette	-	-	-	2

SEMESTER-III

Course Code	Course Title	L	T	P	C
THEORY					
20110AEC31/ 20132AEC31/ 20111AEC31/ 20135AEC31	Tamil-III/Hindi-III/Advanced English-III/French-III	4	0	0	2
20111AEC32	English-III	4	0	0	2
20198SEC33	Cost Accounting	3	1	2	4
20198SEC34	Banking Theory Law and Practice	3	0	1	4
20198AEC35	Programming in C++	2	1	0	3
PRACTICAL					
20198AEC36	Programming in C++ lab	0	0	3	2
RESEARCH SKILL BASED COURSE					
20120RMC37	Research Methodology	2	0	0	2
Total		18	2	6	19
AUDIT COURSE					
201LSCOA	Office Automation	-	-	-	2

SEMESTER-IV

Course Code	Course Title	L	T	P	C
THEORY					
20110AEC41/ 20111AEC41/ 20132AEC41/ 19135AEC41	Tamil-IV/Advanced English-IV/Hindi-IV/French-IV	4	0	0	2
20111AEC42	English-IV	4	0	0	2
20198SEC43	Auditing	3	1	1	3
20198SEC44	Business Statistics	3	1	2	4
20198AEC45	Visual Basic Programming	3	0	0	4
201ENSTU47	Environmental Studies	2	0	0	2
PRACTICAL					
20198AEC46L	Visual Basic Programming Lab	0	0	3	2
Total		19	2	6	19
AUDIT COURSE					
201LSCLS	Leadership and Management Skills	-	-	-	2
201SSCAQ	General Aptitude and Quantitative Ability				2

SEMESTER- V

Course Code	Course Title	L	T	P	C
THEORY					
20198SEC51	Corporate Accounting	4	1	3	4

20198SEC5	Business Economics	3	1	1	4

20198SEC53	Financial Management	3	1	2	4
20198SEC54	Software Engineering	3	1	0	4
20198DSC55_	Discipline Specific Elective-I	3	0	1	2
RESEARCH SKILLBASEDCOURSE					
20120BRC56	Participation in Bounded Research	-	-	-	1
	Total	16	4	6	19
AUDITCOURSE					
201ACLSPSL	Professional Skills	-	-	-	2

Course Code	Course Title	L	T	P	C
THEORY					
20198SEC61	Management Accounting	3	1	2	5
20198SEC62	Income Tax Law and Practice	3	1	1	5
20198SEC63	Database Management System	3	1	1	4
20198DSC64_	Discipline Specific Elective-II	3	0	2	2
201_OEC(2 Digit Course Name)	Open Elective	4	0	0	2
20198PRW66	Project Work	-	-	-	4
20198PROEE	Program Exit Examination	-	-	-	1
	Total	16	3	6	23
AUDITCOURSE					
201SSCIM	Interview Skills Training and Mock Test	-	-	-	2
201LSCCE	Community Engagement	-	-	-	1
201TERP9	Tally ERP9	-	-	-	2
Total Credits-Programme					116
Total Credits -Audit Courses					21

SEMESTER – VI

DISCIPLINESPECIFICELECTIVE

SEMESTER	COURSECODE	COURSE TITLE
V	20198DSC55A	Management Information System Stock Market Practice
	20198DSC55B	
	20198DSC55C	
	20198DSC55D	Portfolio Management
	20198DSC55E	International Marketing
	20198DSC55F	Rural Economics
		International Economics
VI	20198DSC64A	E-Commerce
	20198DSC64B	Web Designing
	20198DSC64C	Management Principles and Applications
	20198DSC64D	Computerized Accounting System
	20198DSC64E	Business Tax Procedures and Management
	20198DSC64F	Fundamentals of Investment

OPENELECTIVE

SEMESTER	COURSE CODE	COURSE TITLE
VI	201TAOEC	TamilHakkiya VaralaruJ ournalism DevelopmentofMathematicalSkillsI nstrumentation Food and AdulterationWildLifeC onservationWebTechn ology E-Learning
	201ENOEC	
	201MAOEC	
	201PHOEC	
	201CHOEC	
	201MBOEC	
	201CSOEC	
	201CAOEC	

B.Com- CACreditDistribution

Sem	AEC	SEC	DSC	OEC	Research	Others	Total
I	10	06	-	-	-	01	17
II	10	07	-	-	01	-	18
III	10	07	-	-	02	-	19
IV	09	07	-	-	-	03	19
V	-	16	02	-	01	-	19
VI	-	16	02	02	-	03	23
Total	39	59	04	02	04	07	115



Department of Commerce
Ponnavai Parampariam Institute of
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THANJAVUR - 613 403.



SCHOOL OF COMMECRE AND BUSINESS MANAGEMENT

DEPARTMENT OF COMMERCE M.Com, -

REGULATION 2020

COURSE STRUCTURE SEMESTER – I

Course Code	Course Title	L	T	P	C
SEMESTER I					
20261SEC11	Marketing research and Consumer Behavior	6	0	0	4
20261SEC12	Human Resource management	6	0	0	4
20261SEC13	Services Marketing	5	0	0	4
20261SEC14	Advanced Cost Management	6	1	0	4
20261DSC15 --	Discipline Specific Elective - I	5	0	0	4
20261RSL16	Research Led Seminar	-	-	-	1
	Total	28	1	0	21
SEMESTER – II					
20261SEC21	Quantitative Techniques For Decision Making	5	1	0	4
20261SEC22	Total Quality Management	5	0	0	4
20261SEC23	Advanced Management Accounting	5	1	0	4
20261SEC24	Securities Analysis and Portfolio Management	5	0	0	4
20261DSC25 -	Discipline Specific Elective – II	5	0	0	4
20261RMC26	Research Methodology	3	0	0	2
20261BRC27	Participation in Bounded Research	-	-	-	2
	Total	28	2	0	24
SEMESTER - III					
20261SEC31	Project Planning and Control	5	1	0	5
20261SEC32	Advanced Corporate Accounting	5	2	0	5
20261SEC33	Brand Management	5	2	0	5
20261DSC34 -	Discipline Specific Elective – III	5	0	0	4
202 - OEC35	Open Elective	4	0	0	3
20261SRC36	Participation in Scaffold Research (Societal Project)	-	-	-	2
	Total	24	5	0	24
SEMESTER - IV					
20261SEC41	Income Tax Law and Tax Planning	5	2	0	5
20261SEC42	International Business	5	1	0	5
20261SEC43	Co- Operation in India and Abroad	5	1	0	5

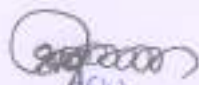
2026IDSC44 -	Discipline Specific Elective - IV	5	0	0	4
2026IPRW45	Project Work	-	-	-	6
2026IPEE	Program – Exit Examination				2
	Total	20	4	0	27
	Total Credit For the Programme	-	-		96

DISCIPLINE SPECIFIC ELECTIVE COURSES

SEMESTER	COURSE TITLE
I	Strategic Management
	Organizational Behaviour
	Consumer Affairs and Customer Care
	Financial Market
II	Corporate Legal Frame Work
	Retail Management
	Information Technology in Business
	Macro and Indian Economy
III	Indian Financial System
	International Marketing
	GST and Indirect Taxes
	Communication in Management
IV	Customer Relationship Management
	International Financial Management
	Indirect Tax Law
	Principles of Micro Economics

Open Electives

Semester	Open Elective Courses
III	a) Writing for the media b) Applicable Mathematics Techniques c) Bio-medical Instrumentation d) Green Chemistry e) Herbal Medicine f) M-Marketing



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B.COM
Indian Economy
20161DSC55C

COURSE OUTCOME

Contemporary Issues in Indian Economy shall provide basic knowledge on national income accountings, various issues involved in agricultural, industrial, financial, trade sectors, public institutions and finally human resources development.

Chapter 1

Growth and development

- Economic Growth in India: National Income Determination, GDP, GNP, NDP, NNP, Personal Income
- Economic Growth versus Economic Development
- Measures of Economic Development: Human Development Index, Green GDP, Gross National Happiness Index
- Economic and Social Development in India: Millennium Development Goals
- Sustainable Development Goals and India

Chapter 2

Issues related to planning

- Issues related to planning in India
- Planning in India: Bombay Plan; People's Plan; Mahalanobis Plan; Wage-Good Model; Gandhian Plan
- Mobilization of Resources

Chapter 3

Inflation

- Inflation in India: CPI, WPI, GDP Deflator, Inflation Rate
- Types of Inflation: Demand Pull, Cost-Push, Stagflation, Structural Inflation, Deflation, and Disinflation
- The Cost of Inflation

Chapter 4

Monetary policy in India

- Monetary Economics: Barter System, Definition, Function and Evolution of Money
- Monetary Policy in India: Inflation, deflation, Recessionary and Inflationary Scenarios
- Monetary Policy tools and Money Supply in India
- Monetary Policy Agreement in India

Chapter 5

Banks & Financial markets

- Banking in India: Definition, Functions, and Types of Banks
- Development Finance Institutions: IFCL, ICICI, SIDBI, IDBI, UTI, LIC, GIC
- Nationalisation of Banks
- Banking Sector Reforms in India: Narasimhan Committee 1&2, Nachiket Mor Committee, P.J. Nayak Committee
- Problem of Non Performing Assets in India
- Non-Banking Financial Companies in India
- Financial Inclusion in India: Need and future; PMJDY; Payment Banks and Small Banks

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Business Mathematics
20161DSC55D

COURSE OUTCOMES

Confidence in Mathematical Skills: Participants will gain increased confidence in their ability to perform calculations, interpret numerical data, and apply mathematical concepts to solve business-related problems.

COURSE OBJECTIVE:

Studying this subject would improve the mathematical abilities and statistical skills of the students and help them in understanding related concepts.

Unit 1

Percentage: Meaning, practical use and computation of percentages.

Unit 2

Ratio, Proportion and Variation : Inverse ratio, continued ratio, Direct proportion and inverse proportion. Application to partnership.

Unit 3

Profit and Loss : Problems involving cost price selling price, market price trade discount and cash discount.

Unit 4

Commission and Brokerage : Rate of commission, types of commission agents, problems

Unit 5

Simple and Compound Interest: Concept of principal rate of interest, period and amount by simple and compound interest. Calculation of compound interest when compounded quarterly half yearly and annually.

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Consumer Protection and Consumer Rights
20161DSC55E

Objective:

This paper seeks to familiarize the students with of their rights as a consumer, the social framework of consumer rights and legal framework of protecting consumer rights. It also provides an understanding of the procedure of redress of consumer complaints, and the role of different agencies in establishing product and service standards. The student should be able to comprehend the business firms' interface with consumers and the consumer related regulatory and business environment.

Unit 1:

Conceptual Framework: Consumer and Markets: Concept of Consumer, Nature of markets, Concept of Price in Retail and Wholesale, Maximum Retail Price (MRP) and Local Taxes, Fair Price, labeling and packaging. Experiencing and Voicing Dissatisfaction; Consumer Satisfaction/dissatisfaction-Grievances-complaint, Consumer Complaining Behaviour: Alternatives available to Dissatisfied Consumers; Internal and External Complaint handling; Corporate Redress Systems and Public Redress Systems

Unit 2:

The Consumer Protection Act, 1986 Objectives and Basic Concepts: Consumer, goods, service, defect in goods, deficiency in service, spurious goods and services, unfair trade practice, restrictive trade practice. Organizational set-up under the Consumer Protection Act: Advisory Bodies: Consumer Protection Councils at the Central, State and District Levels, Basic Consumer Rights, Adjudicatory Bodies: District Forums, State Commissions, National Commission: Their Composition, Powers, and Jurisdiction (Pecuniary and Territorial), Role of Supreme Court under the CPA.

Unit 3:

Grievance Redress Mechanism under the Consumer Protection Act, 1986: Who can file a complaint? Grounds of filing a complaint: Limitation period; Procedure for filing and hearing of a complaint; Disposal of cases, Relief/Remedy to be provided; Temporary Injunction, Enforcement of order, Appeal, frivolous and vexatious complaints; Offences and penalties.

Unit 4:

Industry Regulators and Consumer Complaint Redress Mechanism: Banking: RBI and Banking Ombudsman Insurance: IRDA and Insurance Ombudsman Telecommunication:

TRAI Food Products: FSSAI (an overview) Electricity Supply: Electricity Regulatory Commission Advertising: ASCI

Unit 5:

Consumerism in India: Consumer Movement in India: Evolution of Consumer Movement in India. Formation of consumer organizations and their role in consumer protection, recent developments in



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Merchant Banking
20161DSC55F

Objectives

- To examine Financial Services management as an important and contemporary area of financial management
- To understand the various financial services and their future
- To determine the most suitable financial service, given the situations and contingencies

Unit-I

Financial Services Industry – Emergence – Developments – Fund Based and Non-fund based activities – modern activities – New Financial Products and Services, Innovative Financial Instruments – Challenges Ahead.

Unit-II

Merchant Banking - Issues Management Intermediaries – Merchant Bankers/Lead Managers – Underwriters – Bankers, Brokers and Registrars to an Issue and Share Transfer Agents– Debenture /Trustees – Portfolio Managers – Issue Management Activities/Procedures – Eligibility norms – Pricing of Issues – Promoters' contribution – Issue of Indian Depository Receipts (IDR) – Issue Advertisement – Issue of Debt Instruments – Book building – Green shoe Option – Initial Public Offer through Stock Exchange Online System – Preferential Issues – Qualified Institutional Placement.

Unit-III

Factoring and Forfeiting - Modus Operandi, types, functions – Factoring in India - Bills Discounting – Real estate Industry – Housing Finance – Housing Finance system – National Housing Bank – Refinance scheme for HFCs – Asset Liability Management - Securitization – Mortgage Based Securitization – Reverse Mortgage Loan (RML) Securitization of Standard Assets

Unit-IV

Mutual Funds - Origin, Types of Mutual Funds, Importance, Mutual Funds Industry in India – SEBI's directives for Mutual Funds, Private Mutual Funds, Asst Management company – Unit Trust of India – Evaluation of Performance of Mutual Funds – Money Market Mutual Funds -RBI Guidelines – Venture Capital: Meaning, Origin, Importance, Methods, India Scenario.

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Unit-V Insurance - Meaning, Types, Insurance Industry in India and related reforms – Other Financial Services - Credit Cards - Credit Rating: Regulatory framework – Credit Rating Agencies – Rating Process and Methodology - Rating symbols/Grades – Pension Plan.

References

Khan, M.Y., FINANCIAL SERVICES, Tata McGraw Hill, New Delhi, 2001. Gurusamy, MERCHANT BANKING AND FINANCIAL SERVICES, Tata McGraw Hill, New Delhi, 3rd ed. 2009.

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E-Commerce and its Applications
20161DSC64C

Objective This course is designed to give an overall knowledge of e-commerce and its technologies as well as designing a web page.

Unit 1 :

Fundamentals of E-commerce- definition- features- need & essential requirements- Parties to E-commerce transactions- environment-E-commerce & trade Cycle.- Internet concepts- Private network- Public network (VPN)- Intranet & its applications- Extranet

Unit 2 :

Business Strategy in an Electronic Age -Value Chain-Competitive Advantage-Business strategies.

Unit 3 :

E-commerce Types :Inter-organizational transaction- Purchasing online After sales online-internet trading relationship-B2B- EDI & its impact on BusinessB2C- Intra-organizational E-commerce- Supply chain management.

Unit 4:

Electronic-business E-business solution matrix- electronic Customer Relationship Management & its strategies- Strategies for web auctions- virtual communications & web portals- E-shopping.

Unit 5:

Electronic payment Systems Digital Payment Requirements- Digital Token based Electronic Payment Systems Classification of New Payment Systems Properties of E-cash- Cheque Payment Systems on internet- Risk and Electronic Payment Systems- Designing Electronic Payment System- Digital Signature.

Suggested Readings:

1. Rayudu- C.S - "E-commerce E-business"- Himalaya Publishing House Mumbai.
2. Whiteley David "E-commerce: Strategy- Technologies and Applications"- Tata McGraw Hill- New Delhi- New York.
3. Kalakota- Ravi & Whinston- Andrew B.- "Frontiers of Electronic Commerce" - Addison-Wesley- Massachusetts.

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Industrial Organization
2016IDSC64D

COURSE OBJECTIVES:

Industrial Organization studies the strategic behavior of firms in the market with respect to production, pricing, employment and other choices. One of its main foci is to understand why markets are not perfectly competitive, and what the interaction is between market structure and a firm's behavior.

Introduction

- (a) What is a firm?
- (b) Review: The firm's problem
- (c) Market structure: monopoly, monopsony, market power
- (d) Antitrust Laws

2. Goods, Industries and Competitive Strategy

- (a) Competitive Advantage and Industry Analysis
- (b) Internet Markets
- (c) Information Goods

3. Monopoly: Pricing and Other Strategies

- (a) Price Discrimination
- (b) Pricing in Online Markets
- (c) Product Differentiation
- (d) Durable Goods and Dynamic Pricing
- (e) Switching Costs and Lock-in
- (f) Advertising

4. Strategic Interaction (between firms)

- (a) Review: Game Theory
- (b) Static Oligopoly
- (c) Collusion and Cartels
- (d) Reputation

5. Contractual Relationships Between Firms

- (a) Innovation and Patents
- (b) Mergers
- (c) Vertical Integration and Restraints



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Practical Auditing
2016IDSC64E

UNIT - I

Meaning and definition of auditing – Distinction between auditing and accounting – objectives – Advantages and limitations of audit – scope of audit – classifications of audits – Audit planning, meaning – Audit programme, meaning, objectives and contents – audit note book, contents, usefulness of audit note book – Audit working papers, meaning, Ownership and custody – Test checking and Routine checking, meaning – Internal control, meaning, definition, objectives, Technique for evaluation of internal control system – Internal check, meaning, objectives, difference between internal control, Internal check and internal audit.

UNIT II

Vouching, meaning and definitions, objectives – Trading transactions – audit of ledger- Scrutinizing of ledgers - vouching of cash receipts and payments. Vouching of outstanding assets and liability - verification, meaning objectives and process – valuation of assets and liabilities- Distinction between verification and valuation.

UNIT III

Depreciation and reserves – meaning – Auditor's duty with regard to depreciation – Reserves and provisions- Distinguish reserves and provision – Depreciation of wasting Assets.

UNIT IV

Appointment of auditors – appointment of first auditor – appointment by central government – filling of casual vacancy – Appointment by special resolution – Re-appointment and compulsory re-appointment – ceiling on the number of Auditorship - Removal of auditor – Remuneration - auditors fees – qualification and disqualification – Duties of the company auditor – Rights and powers of auditors – different classes of auditors – Audit Report – Preparation and Presentation.

UNIT V

EDP audit – meaning – Division of auditing in EDP environment – Impact of computerization on audit approach – online computer system audit – Types of online computer systems – audit around with the computers – procedure of audit under EDP system.

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Industrial Relation
20161DSC64F

Objectives:

To sensitize the students with the basics of Industrial Relations and Employee Relations To impart information's about Industrial Relations as an important aspect of Industrial Management.

Module 1:

INTRODUCTION: Concept of Industry and Industrial Relations. Development of Industry and Industrial Relations. Meaning of Employee Relations and its difference with Industrial Relations. Nature and Scope of Industrial Relations as an inter-disciplinary subject. Tripartite Scheme of Industrial Relations. Approaches to Industrial Relations - Sociological Approach - Psychological Approach - Marxian Approach - Trusteeship Approach

Module 2:

State of Industrial Relations Meaning of Good and Poor Industrial Relations Causes for poor industrial relations. Indicators of Poor Industrial Relations

- a. Absenteeism
- b. Labor Turn Over
- c. Industrial Indiscipline
- d. Grievances [with special reference to women employees in India]
- e. Strikes
- f. Lock outs

Module 3:

TRADE UNIONS AS AN ESSENTIAL COMPONENT OF INDUSTRIAL RELATIONS
Definitions of Trade unions. Reasons for formation of trade unions. Characteristics of Trade Unions. Functions of Trade Unions Problems faced by Trade unions and future of trade unions

Module 4:

COLLECTIVE BARGAINING Concept. Essential Pre requisites for collective bargaining. Levels of Collective Bargaining-Plant Level, Industry Level and National Level The collective Bargaining Process Advantages and disadvantages of collective bargaining

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Module 5:

Labour Laws and Industrial Relations Meaning of Labour Laws. Importance of Labour Laws in Industrial Relations. Few examples of Labour Laws, specific to India, with a brief introduction The Industrial Disputes Act, 1947, The Payment of Wages Act, 1936, The EPF (and Miscellaneous Provisions) Act, 1952, The ESI Act, 1948

BOOKS FOR REFERENCE:

1. Gandhi, M.K., Capital and Labour, Bharatiya Vidya Bhavan, Mumbai, 1998
2. Gandhi M K: Satyagraha in South Africa, Bharatiya Vidya Bhavan, Mumbai, 1998
3. Karl Marx & Frederick Engels: Manifesto of the Communist Party, Progress Publishers, Moscow, 1986



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Portfolio Management
 2019DSC55C

Learning Objectives	
1.	To become familiar with various Investment avenues and Portfolio Construction
2.	To understand the Equity Shares, Preference Shares and Bonds valuation models
3.	To learn about long-term and short-term investment analysis tools.
4.	To analyse with Portfolio theories.
5.	To gain knowledge in Portfolio performance methods.

Course Units

UNIT I Investment and Portfolio Management Investment – Meaning – Nature and scope of Investment – Investment vs Speculation – Type of Investors – Investment Avenues – Factors influencing the investment choice – Portfolio Management: Meaning and significance, Active Vs. Passive portfolio management - Strategic Vs. Tactical asset allocation - Factors Affecting Investment Decisions in Portfolio Management.	(12 hrs)
UNIT II (12hrs) Valuation of Securities Bond: Introduction – Reasons for issuing Bonds – Features of Bond – Types of Bonds – Determinants of bond safety – Bond Prices, Yields and Interest Rates – Measuring Price Volatility of Bonds – Macaulay Duration and Modified Duration - Preference Shares: Introduction – Features of Preference Shares - Preference Shares Yield – Holding Period Return – Yield to Call – Concept of Present Value – Equity Share Valuation Models.	
UNIT III Fundamental Analysis and Technical Analysis Fundamental Analysis: Objectives – Economic Analysis, Industry Analysis, Company Analysis - Technical Analysis: Meaning- Assumptions – Pros and cons of technical analysis – Differences between fundamental analysis and technical analysis – Dow Theory – Types of Charts – Chart Patterns – Trend Analysis – Support Line and Resistance Line – Volume Analysis – Indicators and Oscillators – Simple Moving Average – Exponential Moving Average – Relative Strength Index – Bollinger Band – Elliott Wave Theory.	(12 hrs)
UNIT IV Efficient Market Hypothesis Efficient Market Hypothesis – Markowitz Model, Arbitrage Pricing Theory – Sharpe's Single index portfolio selection method – Capital Asset Pricing Model (CAPM).	(12hrs)
UNIT V (12hrs) Portfolio Performance Evaluation Portfolio Performance Evaluation – Meaning - Need for Evaluation - Methods of calculating Portfolio return - Sharpe's Ratio - Treynor's Ratio - Jensen's Differential Returns - Portfolio Revision - Need for Portfolio Revision - Formula Plans.	

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International Marketing
20198DSC55D

COURSE OBJECTIVE: To familiarize the students to the basic concepts of international business management.

COURSE OUTCOME: Students would be familiar with global business environment, global strategic management practices and get acquainted with functional domain practices. They would be familiar with conflicts situations and ethical issues in global business.

UNIT-I Nature and scope of international business-Growing relevance of international business-Types, Importance of international business. Business environment- internal and external environment. Economic and political Environment-Economic roles of Government-Demographic environment-Cultural environment.

UNIT-II International Economic Institutions-IMF, World Bank, UNCTAD, UNIDO, GATT, WTO-organizational Structure, objectives and functions

UNIT-III International Trade- Theories-Adam Smith, David Ricardo, Heckscher-Ohlin, and Leontief Paradox. Government influence on trade-protectionism. Exim policy of India-Export promotion-incentives-SEZ-objectives of SEZ. -BoP vs BoT-Components of BoP.

UNIT IV MNCs- Benefits to host country-problems of MNCs -MNCs in India. Transfer of technology-levels,channels-methods of technology transfer-International investments-Significance and types of international investments-FDI .FII- factors affecting FDI-Cross-border M&As.

UNIT-V Globalisation and business -Features of globalization-essential conditions for globalization-foreign market entry strategies-Pros and cons of Globalisation.Global competitiveness-determinants and its pillars-IT revolution and Business Environment

TEXT/ REFERENCES

Francis Cherunilam, " International Business Environment", Himalaya Publishing House Mumbai, 4th Edition

K.Aswathappa, "Essentials of Business Environment-Text,Cases &Exercises", Himalaya Publishing House, Mumbai, 12th Revised Edition.

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Rural Economics
20198DSC55E

Unit 1

Rural Economy of India Features of Rural Economy Role and Importance of Animal Husbandry in Rural Economy Place of agriculture in Rural Economy.

Unit 2

Agricultural Productivity: Farm Size, Land Utilization and Cropping Pattern, Agricultural Productivity Causes of Low Productivity in Agricultural, measures taken to improve the productivity.

Unit 3

Rural Poverty and Unemployment : Causes, Extent, various Rural Development Programmers for reducing the rural Poverty and Unemployment.

Unit 4

Rural Industrialization : Need, Importance and problems of Agro-based Industries Small-scale and Cottage Industries.

Unit 5

Rural Finance : Need and Sources of rural Finance, Problem of Rural Indebtedness and its relief measures.

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International Economics
20198DSC55F

COURSE OBJECTIVES:

- To familiarize students with concepts of economics and its relevant in business scenario
- To understand the applications & implications of economics in decision-making and problem solving.
- To Understand the optimal point of productivity of a firm.
- To describe the pricing strategies that are consistent with evolving marketing needs
- To Provide insights to the various market structures in an economy.

UNIT I

Nature and scope of managerial economics – definition of economics – important concepts of economics – relationship between micro, macro and managerial economics – nature and scope – objectives of firm.

UNIT II

Demand analysis – Theory of consumer behavior – Marginal utility analysis – indifference curve analysis Meaning of demand – Law of demand – Types of demand – Determinants of demand – Elasticity of demand – Demand forecasting.

UNIT III

Production and cost analysis – Production – Factors of production – production function – Concept – Law of variable proportion – Law of return to scale and economies of scale – cost analysis – Different cost concepts – Cost output relationship short run and long run – Revenue curves of firms – Supply analysis.

UNIT IV

Pricing methods and strategies – Objectives – Factors – General consideration of pricing – methods of pricing – Dual pricing – Price discrimination

UNIT V

Market classification – Perfect competition – Monopoly – Monopolistic competition – Duopoly – Oligopoly.

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AIM: To enhance production and productivity, decrease cost of production and maximize prosperity both for employer and employees having common interests.

LEARNING OBJECTIVES:

- To impart knowledge about evolution of management.
- To provide understanding on planning process and importance of decision making in organization.
- To learn the application of principles in organization.
- To study the process of effective controlling in organization.
- To familiarize students about significance of ethics in business and its implications.

UNIT - I

Management: Importance – Definition – Nature and Scope of Management - Process – Role and Functions of a Manager - Levels of Management – Development of Scientific Management and other Schools of thought and approaches.

UNIT - II

Planning: Nature – Importance – Forms – Types – Steps in Planning – Objectives – Policies – Procedures and Methods – Natures and Types of Policies – Decision – making – Process of Decision – making – Types of Decision.

UNIT - III

Organizing: Types of Organizations – Organization Structure – Span of Control and Committees – Departmentalization – Informal Organization- Authority – Delegation – Decentralization – Difference between Authority and Power – Responsibility.

UNIT - IV

Direction – Nature and Purpose. Co- ordination – Need, Type and Techniques and requisites for excellent Co-ordination - Controlling – Meaning and Importance – Control Process.

UNIT - V

Definition of Business ethics - Types of Ethical issues - Role and importance of Business Ethics and Values in Business - Ethics Internal - Ethics External - Environment Protection - Responsibilities of Business

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Computerized Accounting System
20198DSC64D

Course Objective

This course aims to make students understand and to acquire basic knowledge in the Computerized accounting systems and its applications in the area of business.

Course Outcomes

On Successful completion of the Course, Students will be able to: CO 1: Compare the differences between manual accounting and Computerized accounting and develop skills to master the practical aspects of Computerized accounting. CO 2: Prepare Final accounts of Sole traders and maintain other registers and reports pertaining to accounts and Inventory.

UNIT-I:

Introduction to Computerized Accounting: Introduction – Importance - Application - Advantages and disadvantages – Difference between Manual Accounting and Computerized Accounting – Features of Accounting packages.

UNIT II

Company Creation and Accounting Masters Creation of Company- steps-selecting a company-closing a company-alter -delete a company – Accounts Groups-Predefined Groups– Ledgers – create-alter- delete, voucher types – short cut keys- Voucher Entry-display - alter – delete – Features – Accounting Features- Inventory Features-Configuration menu– Day Book – Cash and Bank Books-Rectification of Error altering the transactions- Bank Reconciliation Statement.

UNIT-III:

Accounts with Inventory Creation of Stock Groups – display-alter-delete-Stock categories – creation - Stock items create-display-alter-delete – Good owns - Units of Measure - Inventory Vouchers-Display of inventory reports & statements.

UNIT IV

Final Accounts and Report Generation Final Accounts of Sole Traders: Trial Balance - Profit and Loss Account - Balance Sheet Preparation of Final Accounts-Generation of Reports-Account Books – Registers - Statement of Accounts.

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Business Tax Procedures and Management
2019DSC64E

Learning Objectives	
1	To identify deductions from gross total income and computation of income for different classes of assesses
2	To understand the procedure for filing of returns and tax planning
3	To analyse the structure on international business taxation
4	To assess Goods and Services Tax and filing GST returns
5	To compute customs duty as per Customs Act

Course Units

UNIT I Assessment of persons Tax Exemptions for Agricultural Income-Deductions to be made in computing total income (80G, 80GGB & 80GGC, 80IA, 80IAB, 80IAC, 80IB, 80IBA, 80ID, 80IE, 80JA, 80JAA, 80LA, 80M, 80P, 80PA) – Assessment of Firms, AOP, BOI, Company and Co-operative society.	(18 hrs)
UNIT II Tax Returns and Tax planning Return of income: Statutory obligation, Return Forms, Time for filing of return, Revised return, Modified return-Assessment -Tax Deducted at Source - Advance payment of Tax: Persons liable to pay, Due date, Computation - Payment in pursuance of order of Assessing Officer, Consequences on non-payment. – Tax planning, Tax avoidance and Tax evasion - Tax planning and specific management decisions: Make or buy, Own or lease, Retain or replace, Shut down or continue.	(18 hrs)
UNIT III International business taxation International business taxation - Taxation of Non-resident - Double taxation relief - Transfer pricing and other anti-avoidance measure - Application and interpretation of tax treaties - (Double taxation avoidance agreement - DTAA) - Equalization levy.	(18 hrs)
UNIT IV Goods and Services Tax Goods and Services Tax: GST Act, 2017 - Registration – Procedure for registration under Schedule III – Amendment of registration – Rates of Tax of IGST, CGST, SGST/UGTST- Assessment of GST- Self-assessment – Provisional assessment – Scrutiny of returns – Assessment of non filers of returns – Assessment of unregistered persons – Assessment in certain special cases – Tax Invoice – Credit and Debit Notes – Payment of Tax – Input Tax Credit - Anti profiteering – Filing of Returns- Penalties – Prosecution – Appeal and Revision.	(18 hrs)
UNIT V Customs Act, 1962 Customs Act, 1962: Important Definitions – Basics – Importance of Customs Duty – Constitutional authority for levy of Customs Duty – Types of Customs Duty – Prohibition	(18 hrs)

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Fundamentals of Investment
20198DSC64F

Objective:

To familiarize the students with different investment alternatives, introduce them to the framework of their analysis and valuation and highlight the role of investor protection.

Unit I

Investment Environment The investment decision process, Types of Investments – Commodities, Real Estate and Financial Assets (Equity, Mutual funds, Debt), the Indian securities market, the market participants (Stock exchanges, Stock brokers, Clearing House, Depositories, Depository Participants, FIIs, Domestic institutional investors, Individual investors), Online and offline trading in securities, security market indices, sources of financial information, Concept of return and risk, Impact of Taxes and Inflation on returns:

Unit II

Analysis of Equity and Debt Instruments

(a) Fixed Income Securities Bond features, types of bonds, estimating bond yields, Bond Pricing, types of bond risks, default risk and credit rating, Bond market indices.

(b) Approaches to Equity Analysis Introduction to Fundamental Analysis, Technical Analysis, dividend capitalization models, and price-earnings multiple approach to equity valuation, Intrinsic value, Price to Book value ratio

Unit III

Portfolio Analysis and Financial Derivatives Portfolio and Diversification, Portfolio Risk and Return; Mutual Funds; Introduction to Financial Derivatives; Financial Derivatives Markets in India

Unit IV:

Investor Protection Role of SEBI and stock exchanges in investor protection; investor grievances and their redressed system, insider trading, investor awareness and activism.

References:

1. Jones, C.P. Investments Analysis and Management, Wiley, 8th ed.
2. Chandra, Prassanna. Investment Analysis and Portfolio Management. McGraw Hill Education

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Consumer Affairs and Customer Care
20261DSC15C

Objective:

This paper seeks to familiarize the students with their rights and responsibilities as a consumer, the social framework of consumer rights and legal framework of protecting consumer rights. It also provides an understanding of the procedure of redress of consumer complaints, and the role of different agencies in establishing product and service standards. The student should be able to comprehend the business firms' interface with consumers and the consumer related regulatory and business environment.

Unit 1:

Conceptual Framework Consumer and Markets: Concept of Consumer, Nature of markets: Liberalization and Globalization of markets with special reference to Indian Consumer Markets, E-Commerce with reference to Indian Market, Concept of Price in Retail and Wholesale, Maximum Retail Price (MRP), Fair Price, GST, labeling and packaging along with relevant laws, Legal Metrology.

Unit 2:

The Consumer Protection Law in India 13 Lectures Objectives and Basic Concepts: Consumer rights and UN Guidelines on consumer protection, Consumer goods, defect in goods, spurious goods and services, service, deficiency in service, unfair trade practice, restrictive trade practice.

Unit 3:


Grievance Redressal Mechanism under the Indian Consumer Protection Law Who can file a complaint? Grounds of filing a complaint; Limitation period; Procedure for filing and hearing of a complaint; Disposal of cases, Relief/Remedy available; Temporary Injunction, Enforcement of order, Appeal, frivolous and vexatious complaints; Offences and penalties.

Unit 4:

Role of Industry Regulators in Consumer Protection

- i. Banking: RBI and Banking Ombudsman
- ii. Insurance: IRDA and Insurance Ombudsman
- iii. Telecommunication: TRAI
- iv. Food Products: FSSAI
- v. Electricity Supply: Electricity Regulatory Commission
- vi. Real Estate Regulatory Authority

Unit 5: Contemporary Issues in Consumer Affairs 13 Lectures Consumer Movement in India; Evolution of Consumer Movement in India, Formation of consumer organizations and their role in consumer protection, Misleading Advertisements and sustainable consumption, National Consumer Helpline, Comparative Product testing, Sustainable consumption and energy ratings.


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Financial Market
20261DSC15D

COURSE OBJECTIVES:

To train a strong foundation for the students in the different areas of financial market • To develop the skills required for applying the concepts and techniques in the field of financial market. • To build a strong attitude in the minds of students to work efficiently and effectively.

Unit 1 - Concept of Management-Definitions, Characteristics, Management & Administration, Different Concepts, Management by Communication, Management by Systems, Management by Results, Management by Participation, Management by Motivation, MBE, MBO –Functions of management

Unit 2 - Planning – Meaning, Nature, Definition, significance, Process, Types, Importance, Principles, Steps – Planning and forecasting, Planning and Decision, Making and Planning and Control.

Unit 3 - Organizing –definitions, Principles of Organization, Formal & informal Organizations, Steps, Importance, Organization Development, Problems in Organization, Delegation - Centralization and Decentralization–Span of Control, Types or Forms of Organization - Organizational goals – Determination of Organizational goals and Determinants of Organizational goals.

Unit 4 - Directing- Meaning , Definitions, Nature of Directions, Elements of Direction, Directing and Other Managerial Activities, Importance of Direction-Orders and Instructions, Supervision, Essentials of Effective Supervision and Principles of Direction.

Unit 5 - Leading – Meaning, Functions, Qualities of good leader – Leadership Styles - Motivation-Meaning, Nature Definitions, Benefits, Modern Theories of Motivation – McGregor's Theory, Maslow's hierarchy of Needs Theory - Herzberg's Theory.

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Information Technology in Business
20261DSC25D

Unit I - Calculus

Curvature, radius of curvature, evolutes and involutes. Beta and Gamma functions and their properties.

Unit II - Multiple Integrals And Applications

Multiple integrals – change of order of integration. Applications: Areas (double integration) and volumes by triple integration (Cartesian and polar) – mass and center of mass (constant and variable densities).

Unit III - Analytical Solid Geometry

Directional cosines and ratios – angle between two lines – the equation of plane - equations to a straight line and shortest distance between two skew lines.

Unit IV - Differential Equations

Exact equations, First order linear equations, Bernoulli's equation, orthogonal trajectories, growth and decay, geometrical applications and electric circuits. Equations not of first degree: equations solvable for p, equations solvable for y, equations solvable for x and Clairaut's type.

Unit V - Differential Equations (Higher order)

Linear differential equations of higher order – with constant coefficients, the operator D - Euler's linear equation of higher order with variable coefficients - simultaneous linear differential equations – solution by variation of parameters method – simple applications to electric circuits.

Text Books

1. Venkataraman, M. K, Engineering Mathematics (First Year), Second Edition, The National Publishing Company, Madras, 2001.

Reference Books

1. Bali, N. P, and Manish Goyal, A Text Book of Engineering Mathematics, Lakshmi Publications, New Delhi, 2007.

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Objectives: To enable the students to understand the principles, practices and application in Micro Finance.

UNIT I Introduction: Evolution: Impact and Importance: Micro Financial Services: Steps Initiated in Development of Micro finance

UNIT II Role of Regulatory body in Micro finance: Rural Credit system: Self Help groups (SHG): What is SHG: Features of SHG: Objectivity of SHG: Role of SHG in Micro finance: Self Help group promoting institutions (SHPI): Formation of SHG: Credit Linkage

UNIT III Micro Finance Services: Weaker Sections: SHG-Bank Linkage: Banks and Financial Intermediaries: SHG-Thrift, credit, and Other Financial Services

UNIT IV Formation and development of Micro Services. Micro Finance Institutions: Role of MFI in developing Micro Finance: Enhancing Institutional Finance

UNIT V Micro Finance and Rural Development: Micro Credit Institutions: Non Government Organization (NGO).Prospects of Micro Finance: RBI Role in Regulating: Bank's Role in Micro Finance: Growth of Micro Finance: Development of Micro Finance: Credit Plans: Credit Schemes: social Banking.

Reference Books

1. Micro finance and poverty reduction by susan johnson and bren rogaly - Oxfam 1997
2. Indian micro finance-the challenges of rapid growth-by prabu ghate - Sage 2007
3. Micro finance hand book - by jonna ledger wood - E book
4. Commercial banks in micro finance- by malcolm harper and sukhwinder singh atropa - Teri Press 2005.

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GST and Indirect Taxes
20261DSC34C

COURSE OBJECTIVES:

GST is a destination based tax on consumption of goods and services. It is proposed to be levied at all stages right from manufacture up to final consumption with credit of taxes paid at previous stages available as set off. In a nutshell, only value addition will be taxed and burden of tax is to be borne by the final consumer

UNIT-1

Concept of goods and service tax GST, Main features of GST implemented in India, Background, Causes for adoption and implementation of GST, Favorable impacts and difficulties of GST, Evaluation and suggestion of GST, Classification of GST Dual and Integrated GST, Important terms

UNIT-2

Registration under GST provision and process, Amendment and cancellation of registration, Practical problems relating to registration, Supply of goods and services-Meaning, Scope and types, Determination of time and place of supply of goods and services, Levy and collection of tax, List of exempted goods and services with practical problems.

UNIT-3

Determination of taxable value of goods and services, Items included and deductions against taxable value, Practical problems related to computation of taxable value of goods and services supplied, Tax rates applicable on supply of goods and services, Practical problems relating to calculation of GST payable on goods and services supplied.

UNIT-4

Composition levy- eligibility, provisions, rules, rates and practical problems, Provisions and rules regarding input tax credit, Practical problems relating to calculation of ITC, Performa and preparation of tax invoice, Payment of GST, Return and assessment provision and process, Job work and reverse charge-provisions and rules, Maintenance of accounts and records, Refund of tax.

UNIT-5

Provision of integrated GST regarding interstate supply, Calculation of Taxable supply and tax payable under IGST and adjustment, GST council and administration, Introduction and brief background of customs duty, Important definitions - Goods, Dutiable goods, Person In-charge, Indian customs water, types of customs duty, Valuation for custom duty, items to be included and excluded in customs value, computation of Assessable value and Custom duty (Practical).

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Communication in Management
20261DSC34D

COURSE OBJECTIVES:

- be able to define public relations and identify instances of public relations in multiple contexts
- have an advanced understanding of theories and principles of communication management,
- be able to synthesize broader management knowledge with the principles of communication management,

UNIT -1

Theory of Communication

- Meaning, Features, Uses, Cycle, Feedback, Advantages
- Barriers
- 7 C's of Communication

UNIT 2

Reading Skills

- Close Reading
- Skimming
- Scanning

UNIT 3

Writing Skills

- Summarizing
- Paraphrasing
- Note-making
- Essays- Expository Essay, Descriptive Essay, Narrative Essay
- Letter Writing- Formal Letter, Informal Letter

Speaking Skills

- Oral Presentation- Audio-Visual aids, Audience & Feedback, Delivery of Presentation, Handling Questions
- Group Discussion- Culture & History, Current Affairs, Society-related
- Public Speaking- Public Speech, Extempore
- Interview- Personal, Conversational, Public

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Indirect Tax Law
20261DSC44C

COURSE OBJECTIVES:

To gain expert knowledge about the indirect tax laws in force and the relevant rules and principles emerging from leading cases, to provide an insight into practical aspects and apply the provisions of laws to various situations and to understand the various external auditing requirements under tax laws

Introduction What is GST Need for GST in India

- ▶ Cascading effect of tax
- ▶ Non-integration of VAT and Service Tax causes double taxation
- ▶ No CENVAT Credit after manufacturing stage to a dealer:
- ▶ Cascading of taxes on account of levy of CST Inter-State purchases
- ▶ The existing Indirect Tax frame-work in India suffer from various duties and taxes at Central as well as at State level:
- ▶ Non Ailment of Seamless ITC
- ▶ Tedious Process of Issuance and collection of CST Forms and losses suffered due to them
- ▶ Sharing of Data between Centre and States and various Boards

One Nation-One Tax Dual GST Model

- ▶ Central Goods and Services Tax Act, 2017 (CGST)
- ▶ State Goods and Services Tax Act, 2017 (SGST)
- ▶ Union Territory Goods and Services Tax Act, 2017 (UTGST)
- ▶ Integrated Goods and Services Tax Act, 2017 (IGST)

Goods and Services Tax Network (GSTN)

- ▶ The functions of the GSTN (i.e. Role assigned to GSTN)
- ▶ Constitution (101st Amendment) Act, 2016 GST Council
- ▶ Guiding principle of the GST Council
- ▶ Functions of the GST Council
- ▶ Body of GST Law

Time of Supply under GST Time of Supply in case of Goods Time of Supply in case of Services
Time of Supply in case of change in Rate of Tax

Place of Supply under GST Need for determination of Place of Supply Place of Supply in case of
Goods Place of Supply in case of Services Place of Supply in case of Online Information
Database Access and Retrieval (OIDAR) Services

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Principles of Micro Economics
20261DSC44D

COURSE OBJECTIVES:

This course intends to expose the student to the basic principles in Microeconomic Theory and illustrate with applications. It covers the decision-making behaviour of consumers and producers, and the functioning of markets.

UNIT-1

. Introduction a. Problem of scarcity and choice: scarcity, choice and opportunity cost; production possibility frontier; economic systems. b. Demand and supply: law of demand, determinants of demand, shifts of demand versus movements along a demand curve, market demand, law of supply, determinants of supply, shifts of supply versus movements along a supply curve, market supply, market equilibrium. c. Applications of demand and supply: price rationing, price floors, consumer surplus, producer surplus. d. Elasticity: price elasticity of demand, calculating elasticity- percentage formula, the midpoint formula, elasticity along a straight line demand curve, elasticity and total revenue determinants of price elasticity, other elasticities.

UNIT-2

. Consumer Theory Budget constraint, concept of utility, diminishing marginal utility, Diamond-water paradox, income and substitution effects; consumer choice: indifference curves, derivation of demand curve from indifference curve and budget constraint.

UNIT-3

Production and Costs a. Production: behaviour of profit maximising firms, production process, production functions, law of variable proportions, choice of technology, isoquant and isocost lines, cost minimizing equilibrium condition. b. Costs: costs in the short run, costs in the long run, revenue and profit maximizations, minimizing losses, short run industry supply curve, economies and diseconomies of scale, long run adjustments.

UNIT-4

Market Structures a. Perfect Competition Assumptions, demand and revenue; equilibrium of the firm in the short run and long run; long run industry supply curve; increasing, decreasing and constant cost industries; allocative efficiency under perfect competition.

b. Theory of a Monopoly Firm Concept of imperfect competition; short run and long run price and output decisions of a monopoly firm; concept of a supply curve under monopoly; comparison of perfect competition and monopoly, social cost of monopoly, price discrimination; natural monopoly.

TEXT: Case, Karl E. & Ray C. Fair, Principles of Economics, Pearson Education, 8th edition, 2007.

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VALUE ADDED NEW DIPLOMA AND CERTIFICATE COURSE SYLLABUS

1000 - 2022-2023
Value Added Course
Event Management
Duration: 1 Year
Registration Fee: 1000

OBJECTIVES

- To provide the students with a comprehensive understanding of Event Management.
- To provide the students with a practical understanding of Event Management.

UNIT I

- Introduction to Event Management
- History of Event Management
- Types of Event Management
- Importance of Event Management

UNIT II

- Event Management Process
- Event Management Planning
- Event Management Budgeting
- Event Management Marketing

UNIT III

- Event Management Execution
- Event Management Evaluation
- Event Management Reporting
- Event Management Crisis Management

UNIT IV


- Event Management Innovation
- Event Management Sustainability
- Event Management Social Responsibility
- Event Management Ethics

UNIT V

- Event Management Case Studies
- Event Management Project Work
- Event Management Internship
- Event Management Final Project

BOOKS/REFERENCE:

1. Event Entertainment and Production: Andrew Sisk/Southern Cross Publishers/Wiley & Sons, Inc.
2. Global Events: Advertising & Media/John Wiley & Sons, Inc.
3. Event Impact: Event Management/HPH
4. K. Venkateshram, Event Management, SHIP


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Academic year: 2022-2023

COURSE NAME: IPR

Course: Intellectual Property Rights

Subject code: 226IPR

AIMS: To provide better performance in Intellectual property rights.

OBJECTIVES

To provide comprehensive knowledge regarding the concept of IPR, Copyright and Patents, Trademark, Intellectual Property Rights, International Program Relating to IPR.

OUTCOMES

comprehensive knowledge to the students regarding the effect of IPR especially of patents and copyright laws for patents, trade marks, Trademark Name Dispute and Cyber squatting, Biopiracy etc and for any other details mentioned.

UNIT I

Copyright and Trade Marking Rights Concept and Principles Historical background and Development of Copyright law and International Harmonization, International Convention on Copyright Convention International Agreement Copyright Act

WIPO Performance and Performance strategy

UNIT II

Terms of Copyright conditions for grant of copyright, extent of rights exception to copyright protection, for reproduction, arrangement, licensing Copyrighted literary, Dramatic and Musical, Works, Sound Recording, Cinematograph Films, Copyright in Computer Programme, Author's special Rights, Right of Resemblance and performers.

UNIT III

Copyright Infringement and Copyright Infringement and Procedure Copyright Societies.

Copyright, Neighbouring Rights, International Copyright, Compulsory licence, Infringement.

Copyright Infringement, Infringement of Copyright.

Patent, Utility and Patents, Works, Invention and Infringement

UNIT IV

Historical development of the concept of trademark and trademark law-National and International Introduction to Trade marks Need for Protection, Kinds of trademarks

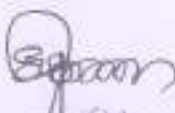
Concept of Well known trademark

UNIT V

Implications on intellectual property Rights, International & National legal preparedness Application of copyright Act 1977, Scope of protection of computer program Application of patents to computer technology

Text & References:

- W.R.Cornish, Intellectual Property, Sweet & Maxwell, London (2000)
- Avtar Singh, Competition Law, Eastern Book Company
- Dr H.K. Sahray, Textbook on Competition Law, Universal Publications
- Brinkhoff (Editor), Patent Cases, Wolters Kluwer
- Hilary Pear and Jill Farquhar, Commercial Exploitation of Intellectual Property


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ODD SEMESTER

Course- Certificate course in Mutual Fund
Operation

Subject Code: 220MMF

AIMS: To explain Better performance in mutual fund operation

COURSE OBJECTIVES:

To provide basic knowledge about the Growth and Role of Mutual funds

To understand Investors Protection and Regulation of Mutual funds etc.

Students will be able to understand calculation of Net Asset Value of mutual funds

OUTCOMES:

- Students will be able to develop appropriate portfolio to invest in stock market conditions.
- Students will be able to prepare financial statement to provide financial information to investors.

UNIT-I

Introduction: The origin, meaning and growth of Mutual Funds; Fund Units Available; Types of Mutual Fund schemes; The role of Mutual Funds; Organization of the Fund Operation of the Fund; Net Asset Value meaning and calculation

UNIT-II

Investor Protection and Mutual Fund Securities; Investor Rights; Facilities available to Investors; Selection of a Fund; Advantages of Mutual Funds; Demographic

UNIT-III

Market Segmentation and Investment Policy; The need for Regulation; Regulation and Investor Protection of India

UNIT-IV

Mutual Funds in India - IIT & Series III Mutual Fund; Other Mutual Funds; Selection of a Fund; Problems in mutual fund sector

UNIT-V

Mutual fund Investment in India - Investment Growth; Types and sub categories of Mutual funds; Examination of Growth; Prospects of Mutual fund in India

BOOKS FOR REFERENCE:

I.K.G. Sahadevan and M. Dharmaraj: "Mutual funds, Data interpretation and Analysis" Prentice Hall of India

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Academic year: 2022-2023

Course: Certificate Course in Life Skills for Youth

Subject Code: 226ILSY

AIM: To emphasis Better performance in life skills for youth

OBJECTIVES:

- The Life Skills Education aims to reinforce existing knowledge and positive attitudes and values along with the prevention of negative attitudes and risky behaviors.
- Life Skills Education youth focus to the promotion of personal and social development and the prevention of health and social problems.

OUTCOMES:

- Gain Self-Competency and self-efficacy
- Practice Emotional Competency
- Gain Intellectual Competency
- Gain an edge through Professional Competency

Unit-I

Understanding Life Skills, Life Skills: Meaning, Need for life skills, Different approaches to life skills.

Unit-II

Key Issues Related with Adolescents Managing Emotions, Managing, Handling conflicts, Building relationships.

Unit-III

Case Strengthening Life Skills-I (Professionalism, grooming and self respect), Positive attitude, Motivation, Study Skills.

Unit-IV

Case Strengthening Life Skills-II (Communication skills, Teamwork, Intrapersonal skills, Critical thinking and problem solving)

Unit-V

Knowing Yourself, Building self-esteem, recognizing the negatives, Setting Goals for the Life.

BOOKS FOR REFERENCE:

- Dr. Ramchandani Bharati - Life Skill Education - Sarva Prasa - 2007
- Dr. Lata K. Datta - Life Skill Education in India - Nova Publications 2012

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Academic year: 2022-2023

Certificate Course in Preparatory for NEET Examination

Subject Code: Z2016SL

AIM: To make conceptual and conceptual based on strategic thinking and critical work

COURSE OBJECTIVES

- To help the students to choose the area where they are interested
- To develop competitive skills through various types of aptitude tests
- To train them by conducting aptitude test based on verbal and quantitative skills
- To enhance their ability to speak in English and have an interview

OUTCOMES:

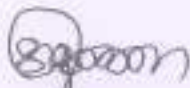
- Confidence level of the students will be improved while appearing for the exam and for various placement drives
- Students will study to face various competitive examinations practically
- Students will do time management while preparing for the competitive exam

Unit 1: Business Environment and International Business

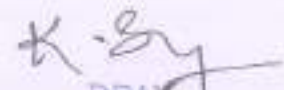
- Concepts and elements of business environment: Economic environment- Economic systems, Economic policy- Monetary and fiscal policies, Political environment- Role of government in business, Legal environment- Consumer Protection Act (COPRA), Social cultural factors and their influence on business, Corporate Social Responsibility (CSR)
- Scope and importance of international business, Globalization and its impact, Modes of entry into international business
- Theories of international trade, Government intervention in international trade, Tariff and non-tariff barriers, India's foreign trade policy
- Foreign direct investment (FDI) and Foreign portfolio investment (FPI), Types of FDI, Costs and benefits of FDI to home and host countries, Trends in FDI, India's FDI policy
- Balance of payments (BOP)- Importance and components of BOP

Unit 2: Business Economics

- Meaning and scope of business economics • Objectives of business firms
Demand analysis: Law of Demand, Elasticity of demand and its measurement, Relationship between AR and MR
- Consumer behaviour: Utility analysis, Indifference curve analysis • Law of Variable Proportions, Law of Returns to Scale
- Theory of cost: Short run and long run cost curves
- Price determination under different market forms: Perfect competition, Monopolistic competition, Oligopoly- Price leadership model, Monopoly, Price discrimination
- Pricing strategies: Price skimming, Price penetration, Peak-load pricing



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Unit 3: Business Finance

- Scope and sources of finance; Long term financing
- Cost of capital and time value of money
- Capital structure
- Capital budgeting decisions: Conventional and scientific techniques of capital budgeting analysis
- Working capital management, Dividend decisions: Theories and policies
- Risk and return analysis; Asset securitization

Unit 4: Business Statistics and Research Methods

- Research: Concept and types, Research design
- Data: Collection and classification of data
- Sampling and estimation: Concepts, Methods of sampling - probability and non-probability methods, Sampling distribution, Central limit theorem, Standard error, Statistical estimation
- Hypothesis testing: z-test, t-test, ANOVA, Chi square test, Mann-Whitney test (Direct), Kruskal-Wallis test (H test), Rank correlation test
- Report writing

Unit 5: Marketing Management

- Marketing: Concept and approaches; Marketing channels; Marketing mix; Strategic marketing planning; Market segmentation, targeting and positioning
- Product decisions: Concept - Product line; Product mix decisions; Product life cycle; New product development
- Pricing decisions: Factors affecting price determination; Pricing policies and strategies
- Promotion decisions: Role of - promotion in marketing; Promotion methods - Advertising, Personal selling; Publicity; Sales promotion tools and techniques; Promotion mix
- Distribution decisions: Channels of distribution; Channel management

Books for Reference:

- RPH Editorial Board, UGC NET/JRF Exam: Commerce - Paper II, Ramoh Publishing House, New Delhi
- Dr. L.N. Koli and Madan Singh, UGC (NET / SET / JRF) Utkar Prakashan, 2018 edition / January 2019
- Pratyagita Dasgupta, UGC NET/JRF Exam Solved Papers Commerce, Utkar Publishing House, 2015
- R. Gupta, UGC-NET: Commerce (Paper II), National Testing Agency 2018

H.O.,
Department of Commerce
Ponnaiyah Ramojuayam Institute -
Science & Technology (PRIST)
Declared as DEEMED TO BE UNIVERSITY

DEAN
School of Commerce and Management
Ponnaiyah Ramojuayam Institute -
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SCHOOL OF COMMERCE AND MANAGEMENT

DEPARTMENT OF BUSINESS MANAGEMENT

Minutes of Board of Studies Meeting

The Board of Studies meeting for the department of Business Management is held on 06.05.2022 at 10.00 a.m. PRIST Deemed to be University, Thanjavur under the chairmanship of Dr. K. G. Selvan.

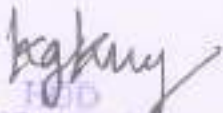
The following members were present:

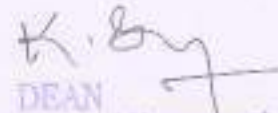
Dr K G Selvan (Chairperson/ HoD)
Dr. N. S. Shibu (External Expert-Academic)
Mr. S. Ravi (External Expert- Industry)
Dr T J Jayasholan / Prof & Member of BOS
Dr. S. Venkatesh / Prof & Member of BOS
Dr. P Balasubramanian / Prof & Member of BOS
Dr. K Rajalakshmi / Prof & Member of BOS
K. Sasikumar / Prof & Member of BOS
P Uma Eswari / Prof & Member of BOS
K. Sathya (Invited Dean)
B. Anuradha (Alumini)
L. Kaviyarasu (Current Student)

The Chairman (BOS) welcomed all the members and presented the feedbacks about existing curriculum received from various Stake holders and also from the department academic advisory committee.

The members of the Board have unanimously discussed and carefully reviewed the existing syllabus for (BBA, MBA and M. Phil) in detail and made the necessary changes in upcoming (BBA, MBA, and M.Phil) as mentioned below.

Signature of the Chairman & Members


100
Department of Business Management,
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The following introduced New Course of (2022 – 2023)

Name of the Programme	Name of the Course	Course code	Year of Introduction
BBA	Taxation Management	20160DSC55C	2022
BBA	Interior Management	20160DSC55D	2022
BBA	Statistics for Management	20160DSC55E	2022
BBA	Integrated Marketing Communication	20160DSC55F	2022
BBA	Marketing Metrics	20160DSC64C	2022
BBA	Mergers and Acquisitions	20160DSC64D	2022
BBA	Social Psychology	20160DSC64E	2022
BBA	Performance & Reward Management	20160DSC64F	2022

Department of Business Management
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The Board of Studies Discussion on Introduced Value Added Certificate Course.
(2022-2023)








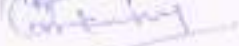

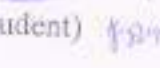
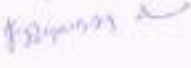
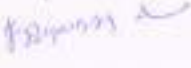
S.NO	COURSE TITLE	COURSE CODE
1	Diploma in E-Banking	2261EB
2	Diploma in Tax Procedure & Practices	2261TP
3	Certificate course in sales and marketing	2261SM
4	Certificate Course in intelligence for excellences	2261IE
5	Certificate course in internet things	2261IT

K. S. J.

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K. S. J.
Ponnavayal Ramaswami Institute of
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THANJAVUR - 613 401.

Members Signature

- Dr K G Selvan (Chairperson/ HoD) 
- Dr. N. S. Shibu (External Expert-Academic) 
- Mr. S. Ravi (External Expert- Industry) 
- Dr T J Jayasholan / Prof & Member of BOS 
- Dr. S. Venkatesh / Prof & Member of BOS 
- Dr. P Balasubramanian / Prof & Member of BOS 
- Dr. K Rajalakshmi / Prof & Member of BOS 
- K. Sasikumar / Prof & Member of BOS 
- P Uma Eswari / Prof & Member of BOS 
- K. Sathya (Invited Dean) 
- B. Anuradha (Alumini) 
- L. Kaviyarasu (Current Student) 


Department of Business Management
Mannayakam Institute of
Science & Technology
Tamil Nadu


DEAN
School of Commerce and Management
Mannayakam Institute of
Science & Technology (MIST)
TAMIL NADU - 611 303.

BACHELOR OF BUSINESS ADMINISTRATION

Course Structure-2020

Course Code	Course Title	L	T	P	C
SEMESTER I					
20110AEC11/ 20111AEC11/ 20132AEC11/ 20135AEC11	Tamil - I/Advanced English-I/Hindi-I/French - I	4	0	0	2
20111AEC12	English I	4	0	0	2
20160SEC13	Principles of Management	5	0	0	3
20160SEC14	Managerial Economics	5	0	0	3
20160AEC15	Business Communication	5	0	0	4
20160AEC16	Business Mathematics and Statistics	4	0	0	3
201LSC3C	Indian Constitution	-	-	-	2
Total		27	0	0	19
AUDIT COURSE					
201LSCUV	Universal Human Values	-	-	-	2

SEMESTER II					
20110AEC21/ 20131AEC21/ 20111AEC21	Tamil II / Hindi II/ Advanced English II	4	0	0	2
20111AEC22	English II	4	0	0	2
20160SEC23	Financial Accounting	5	0	0	3
20160SEC24	Organizational Behavior	5	0	0	3
20160AEC25	Business Environment	5	0	0	4
20160AEC26	Management Information System	4	0	0	3
RESEARCH SKILL BASED COURSE					
20160RLC27	Research Led Seminar	0	0	0	1
Total		27	0	0	18
AUDIT COURSES					
201LSCCS	Communication Skills	0	0	0	2
201SSCBE	Basic Behavioral Etiquette	0	0	0	2

SEMESTER III					
20110AEC31/ 20131AEC31/ 20111AEC31	Tamil III / Hindi III/ Advanced English III	4	0	0	2
20111AEC32	English III	4	0	0	2
20160SEC33	Management Accounting	4	0	0	3
20160SEC34	Marketing Management	4	0	0	3
20160AEC35	Business Law	5	0	0	4
20160AEC36	Human Resource Management	4	0	0	3
RESEARCH SKILL BASED COURSE					
20160RMC37	Research Methodology	2	0	0	2
	Total	27	0	0	20
AUDIT COURSES					
2011SCOA	Office automation	0	0	0	2

SEMESTER IV					
20110AEC41/ 20131AEC41/ 20111AEC41	Tamil IV / Hindi IV/ Advanced English IV	4	0	0	2
20111AEC42	English IV	4	0	0	2
20160SEC43	Total Quality Management	5	0	0	3
20160SEC44	Cost Accounting	4	0	0	3
20160AEC45	Retail Management	4	0	0	4
20160AEC46	Industrial Relations and Labor Law	4	0	0	3
201ENSTU45	Environmental Studies	2	0	0	2
	Total	27	0	0	20
AUDIT COURSE					
2011SCLS	Leadership and Management Skills	0	0	0	2
201SSCAQ	General Aptitude and Quantitative Ability	0	0	0	2

SEMESTER V					
20160SEC51	Financial Management	6	0	0	5
20160SEC52	Services Marketing	5	0	0	3
20160SEC53	Production and Operations Management	5	0	0	3
20160SEC54	Global Business Management	6	0	0	4
20160DSC55C / 20160DSC55F	Taxation Management/ Integrated Marketing Communication	5	0	0	3
RESEARCH SKILL BASED COURSE					
20160BRC55	Participation Bounded Research	0	0	0	1
	Total	27	0	0	20
AUDIT COURSE					
201ACLSPSL	Professional Skills	0	0	0	2
SEMESTER VI					
20160SEC61	Business Policy and Strategic Management	5	0	0	4
20160SEC62	Entrepreneurial Development	6	0	0	5
20160SEC63	Logistics and Supply Chain Management	5	0	0	4
20160DSC64C	Marketing Metrics	5	0	0	3
201__OEC(2 Digit Course Name)	Open Elective	4	0	0	2
20160PRW66	Project Work	0	0	0	4
20160PEE	Programme Exit Exam	0	0	0	2
	Total	25	0	0	24
AUDIT COURSE					
201SSCIM	Interview Skills Training and Mock Test	0	0	0	2
201SSCIM	Community Engagement	0	0	0	1
201TERP9	Tally ERP 9	0	0	0	2
Total Credits - Programme					116
Total Credits - Audit Courses					21

Discipline Specific Elective Courses

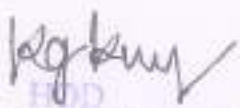
Semester	Elective No	Course Code	Course Title
V	I	20160DSC55D	Interior Management
		20160DSC55E	Statistics for Management
VI	II	20160DSC64D	Mergers and Acquisitions
		20160DSC64E 20160DSC64F	Social Psychology: Performance & Reward Management

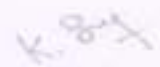
Open Elective Courses

Semester	Course Code	Course Title	Department
VI	20111OEC	Journalism	English
	20114OEC	Food and Adulteration	Chemistry
	20116OEC	Wild life conservation	Microbiology
	20120OEC	E-Learning	Computer science
	20161OEC	Banking Services	Commerce

Audit Courses Audit Courses on Soft Skills

Semester	Elective No	Course Code	Course Title
I	I	201ACLSICN	Indian Constitution
	II	201ACLSUHV	Universal Human Values
II	I	201ACLSCOS	Communication Skills
	II	201ACSSBBE	Basic Behavioral Etiquette
III	I	201ACLSOAN	Office automation
IV	I	201ACLSLMS	Leadership and Management Skills
	II	201ACSSAQA	General Aptitude and Quantitative Ability
V	I	201ACLSPSL	Professional Skills
VI	I	201ACSSIST	Interview Skills Training and Mock Test
	II	201ACLSCET	Community Engagement


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BBA 2020 REGULATION
PRIST UNIVERSITY, THANJAVUR

Course Code	Course Title	L	T	P	C
20160DSC55C	Taxation Management	6	0	0	4

Learning Objectives	
1	To identify deductions from gross total income and computation of income for different classes of assesses
2	To understand the procedure for filing of returns and tax planning
3	To analyse the structure on international business taxation
4	To assess Goods and Services Tax and filing GST returns
5	To compute customs duty as per Customs Act

Course Outcomes

Students will be able to:

CO No.	CO Statement	Knowledge level
CO 1	Apply the provisions of income tax to determine taxable income	K3
CO 2	Plan taxes	K3
CO 3	Illustrate the nuances of international business taxation	K2
CO 4	Apply the provisions of GST	K3
CO 5	Summarise the provisions of Customs Act	K2

UNIT I

Assessment of persons

Tax Exemptions for Agricultural Income-Deductions to be made in computing total income (80G, 80GGB & 80GGC, 80IA, 80IAB, 80IAC, 80IB, 80IBA, 80ID, 80IE, 80JJA, 80JJAA, 80LA, 80M, 80P, 80PA) – Assessment of Firms, AOP, BOI, Company and Cooperative society.

UNIT II

Tax Returns and Tax planning

Return of income: Statutory obligation, Return Forms, Time for filing of return, Revised return, Modified return-Assessment -Tax Deducted at Source - Advance payment of Tax: Persons liable to pay, Due date, Computation - Payment in pursuance of order of Assessing Officer, Consequences on non-payment. – Tax planning, Tax avoidance and Tax evasion - Tax planning and specific management decisions: Make or buy, Own or lease, Retain or replace, Shut down or continue.

UNIT III

International business taxation

International business taxation - Taxation of Non-resident - Double taxation relief - Transfer pricing and other anti-avoidance measure - Application and interpretation of tax treaties - (Double taxation avoidance agreement - DTAA) - Equalization levy.

UNIT IV

Goods and Services Tax

Goods and Services Tax: GST Act, 2017 - Registration – Procedure for registration under Schedule III – Amendment of registration – Rates of Tax of IGST, CGST, SGST/UGTST- Assessment of GST- Self-assessment – Provisional assessment – Scrutiny of returns – Assessment of non filers of returns – Assessment of unregistered persons – Assessment in certain special cases – Tax Invoice – Credit and Debit Notes – Payment of Tax – Input Tax Credit - Anti profiteering – Filing of Returns- Penalties – Prosecution – Appeal and Revision.

UNIT V

Customs Act, 1962

Customs Act, 1962: Important Definitions – Basics – Importance of Customs Duty – Constitutional authority for levy of Customs Duty – Types of Customs Duty – Prohibition of Importation and Exportation of goods – Valuation of goods for Customs Duty – Transaction Value – Assessable Value – Computation of Assessable Value and Customs Duty.

Department of Business Management
Ponnamyil Management Institute of
Science & Technology (PMIST)
THRISSUR - 673 401.

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Course Code	Course Title	L	T	P	C
20160DSC55D	Interior Management	6	0	0	4

Course Objective

To provide adequate facility for work, relaxation, rest, comfort, privacy, maintenance, aesthetics etc. through interiors. To understand the application of anthropometric measurements and economical evaluation in residential space designing for various activities.

UNIT- I

Light: aspects of lighting – physical psychological aspects, color of light color rendition daylight artificial light brightness the visual environment- study of day lighting as a means of providing light within built spaces. Day visual perception and light basic artificial lighting sources, light and visual effects, light revealing architecture designing for artificial lighting quantity and quality integration with daylight ting. computer simulation programs that aid artificial lighting design.

UNIT- II

Light distribution, intensity & diffusion, light & visual effect, lighting & conservation, lighting as a system lamping, beam spread, color effects, illumination and calculation, and light manipulation, electricity, electrification systems, voltage, wiring, breakers, fuses and. Lighting fixture and fitting types, output, efficiency & cost.

Unit- III

Types of lamps- Incandescent, fluorescent & HID lamps, their lighting characteristics & applications. Illumination levels and various tasks and distribution of luminaries for better lighting in the interiors space- transforming light techniques in an apartment, retail store, exhibition space. Design of lighting for various spaces like restaurants, hotel lobbies, institutes, halls, offices and transit facilities.

Unit- IV

Color- history of color, effect of colors, color, mixing, color dynamics, color planning in design. Various color system- Muncell system, Oswald system, DIN system, QAS system, color aid system- color system in practice, color terminology, analysis of color wheel, color schemes, psychological- impact of colors, special color issues mixed color effects, effect of texture.

Unit- V

Use of colors in various functional contexts; color in historic interiors, color in current practice. Selection of colors for various spaces like restaurants, hotel lobbies, institutes, halls, offices and transit facilities.

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Course Code	Course Title	L	T	P	C
20160DSC55E	Statistics for Management	5	0	0	4

COURSE OBJECTIVE

- Measures of Central Tendency
- Measures of Variation
- Analyze of Time Series
- Understand Index Numbers
- Test Hypothesis

COURSE OUTCOME:

- CO1- Measures of Central Tendency
 CO2 -Measures of Variation
 CO3 -Analyze of Time Series
 CO4- Understand Index Numbers
 CO5- Test Hypothesis

UNIT I

Introduction – Meaning and Definition of Statistics – Collection and Tabulation of Statistical Data – Presentation of Statistical Data – Graphs and Diagrams- Measures of Central Tendency – Arithmetic Mean, Median and Mode – Harmonic Mean and Geometric Mean.

UNIT II

Measures of Variation – Standard Deviation –Mean deviation – Quartile deviation- Skewness and kurtosis – Lorenz Curve –Simple Correlation – Scatter Diagram – Karl Pearson's Correlation – Rank Correlation – Regression.

UNIT III

Analysis of Time Series – Methods of Measuring Trend and Seasonal Variations

UNIT IV

Index Numbers – Consumer Price Index – And Cost of Living Indices- Statistical quality control

UNIT V

Testing of hypothesis – Chi-Square test, T Test, F Test, ANOVA.


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 Pontiyah Road, Jambang, Johor Bahru
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 TANDJUR - 813 001.



Course Code	Course Title	L	T	P	C
20160DSC55F	Integrated Marketing Communication	5	0	0	4

COURSE OBJECTIVE: Due to ever increasing business dealings the subject of International Marketing has gained utmost importance in recent times. The world these days, indeed has shrunk and foreign markets have particularly become important especially for a developing country like India. The major objective of this course is to provide an exposure to the area of Marketing in the International perspective.

COURSE OUTCOME

Unit I: Introduction Integrated Marketing Communication - Concept, Process, Communication Mix, IMC plans- Overview of advertising management; Advertising and IMC process - Advertising Agency - Choosing an advertising agency; Advertising planning and research; Advertising goals - Advertising budget; Advertising design; Advertising media selection.

Unit II: Sales Promotion The scope and role of sales promotion; Types, Planning Sales Promotion Programmes; Consumer oriented sales promotion; Trade oriented sales promotion; Coordinating sales promotion and advertising; Personal Selling, Role, Advantages and Disadvantages, Personal Selling Skills.

Unit III: Public Relations, Publicity and Corporate Advertising Public Relations Publicity and Corporate advertising; Public Relations functions; Creating positive image building activities; Preventing or reducing image damage; sponsorship and event marketing; Role of internet in PR.

Unit IV: Social and Ethical Aspects of Advertising and Promotion Regulations of Advertising and Promotion in India, regulation of other Promotional Areas, Social Implications of Advertising, Moral and Ethical Issues in Advertising; Advertising to children, Advertising controversial products, Social Aspects of Advertising.

Unit V: Evaluation Monitoring and Control Measuring the effectiveness of promotional program; Conducting research to measure advertising effectiveness; Testing process; Establishing the program for measuring the advertising effects; Measuring the effectiveness of other program elements.

TEXT/ REFERENCES

1. George Belch, Michael Belch & Keyoor Purani, Advertising & Promotion- An Integrated Marketing Communications Perspective, TMH, Latest Edition.
2. Kruti Shah and Alan D'Souza, Advertising & Promotions: An IMC perspective, TMH, Latest Edition.
3. Terence A. Shimp, Advertising & Promotion: An IMC approach, Cengage Learning, Latest Edition.

[Signature]

HOD

Department of Business Management
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[Signature]
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Course Code	Course Title	L	T	P	C
20160DSC64C	Marketing Metrics	5	0	0	4

LEARNING OBJECTIVES

To understand the concepts of marketing management To learn about marketing process for different types of products and services To understand the tools used by marketing managers in decision situations To understand the marketing environment

Course Outcomes

- Students will demonstrate strong conceptual knowledge in the functional area of marketing management.
- Students will demonstrate effective understanding of relevant functional areas of marketing management and its application.
- Students will demonstrate analytical skills in identification and resolution of problems pertaining to marketing management.


UNIT - I Market and Marketing: Distinction between marketing and selling - Types of market – Concepts–Functions–Marketing management–Objectives–Importance–Marketing Environment–Marketing Information System.

UNIT - II Market Segmentation: Criteria of effective segmentation – Benefits – Bases for Market segmentation–Factors Influencing Consumer Behavior–Buyer motives–Buying process.

UNIT - III Marketing Mix - Product planning and development – Product mix decisions – New product development – Product life cycle and strategies - Pricing – Meaning – Influencing factors –Objectives –Pricing methods.

UNIT - IV Marketing channels -Need and importance – Classification – Types of Intermediaries – Wholesalers – Functions – Retailers – Functions - Physical distribution – Elements of Physical distribution(logistics)

UNIT - V Promotion mix - Personal selling –Process - Advertising – Objectives – Types - Sales promotion–Objectives –Sales promotion methods, publicity and public relations.


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Course Code	Course Title	L	T	P	C
20160DSC64D	Mergers and Acquisitions	5	0	0	4

COURSE OBJECTIVES

The objective of this course is to build awareness and basic knowledge of how mergers and acquisitions happen. This course will help them to understand the procedure of implementation from proposal through valuation to integration

COURSE OUTCOMES

- CO1- Acquire conceptual understanding of Mergers
- CO2 -Know about strategic perspective & strategic approaches to M & A.
- CO3 -Become aware of the concept of Corporate Restructuring and its methods
- CO4 -Know about the Merger Process and process of merger integration
- CO5 -Know about various Valuation Approaches.

UNIT I

INTRODUCTION: Mergers-in the nature of acquisitions and amalgamations, types of merger – motives behind mergers – theories of mergers – operating, financial and managerial synergy of mergers – value creation in horizontal, vertical and conglomerate mergers – internal and external change forces contributing to M&A activities- understanding cross border acquisitions M&A - strategic perspective- industry life cycle and product life cycle analysis in M&A decision, strategic approaches to M&A- SWOT analysis, BCG matrix, Porter's Five forces model-trends in merger activities India and abroad.

UNIT II

CORPORATE RESTRUCTURING: Corporate restructuring – different methods of restructuring – joint ventures –sell off and spin off– divestitures – equity carve out – leveraged buy outs(LBO) – management buy outs – master limited partnerships – employee stock ownership plans /stock option plan(ESOP)- detailed understanding of all types of restructuring. Merger Process: Dynamics of M&A process- identification of targets negotiation-closing the deal. Five-stage model – due diligence (detailed discussion). Process of merger integration – organizational and human aspects –managerial challenges of M& A

UNIT III

VALUATION: Valuation – cost of capital-traditional valuation approaches – discounted cash flow valuation – asset based valuation- brand valuation-firm valuation-equity valuation- FCFE and FCFF- relative valuation-adjusted present value- (Including problems) Methods of financing mergers – cash offer, share exchange ratio – (Including problems) - mergers as a capital budgeting decision.

UNIT IV

TAKEOVERS: Takeovers, types, hostile takeover approaches, Takeover defenses –bid resistance strategies–bid defense strategies—pre offer defenses–poison pill defense–shark repellents–post offer defences greenmail–white knight–financialdefensive measures – Coercive offers and defense – antitakeover amendments – impact of takeover defenses on shareholder value.

UNIT V

LEGAL, TAXATION, AND ACCOUNTING ASPECTS: Legal and regulatory frame work of M & A – provisions of Companies Act 2013, – SEBI Takeover Code, Provisions of Competition Act, Taxation of Mergers, Acquisitions and Amalgamations: Amalgamation, Demerger – Special provisions for computation of cost of acquisition- Conditions for availing loss and depreciation – Tax Neutrality. Accounting aspects of Mergers: Principal methods of Accounting for mergers and acquisitions – Pooling of Interests Method – Advantages and Disadvantages; Purchase method – advantages and Disadvantages – Use of Purchase method, determination of Purchase price, accounting method in India (Including problems).



Department of Business Management
Parul University
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Course Code	Course Title	L	T	P	C
20160DSC64E	Social Psychology	5	0	0	4

COURSE OBJECTIVE

The goals of social psychology are to understand how individuals and society interact with each other, and how social situations influence people's thoughts, feelings, and behaviors.

COURSE OUTCOME

1. To identify key concepts in Social Psychology.
2. To describe major studies in social psychology.
3. To describe competing theories in social psychology.
4. To understand the different methodologies by which social psychology is examined.
5. To relate the concepts to real world events.

UNIT – I

Nature, subject matter, and scope of Social Psychology. Methods of Studying Social Psychology and its importance, Major Themes of social psychology- seven themes, Relationship of social psychology with Sociology and Psychology

UNIT – II

Life Span Development: Infancy and Childhood, Adolescence, Middle Age, Old Age- Cognitive, Emotional, Social and Moral Development. Sensory Perceptual Processes- Sensation, Perception, Memory.

UNIT – III

The self- Executive and organizational functions and Gender and cultural differences, Introspection, and self-awareness theory in Psychology Introspection and self-awareness theory in psychology- Definition and examples

UNIT – IV

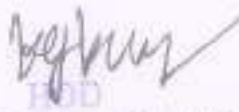
The ABC model of attitudes- Affect, behavior, and cognition, Implicit Vs. Explicit attitudes- Definition and examples, Persuasion- Types of persuasion Techniques

UNIT – V

Prosocial behavior -Altruism and prosocial Behavior- Definition and predictors Positive moods and negative state-How positive moods and negative state Relief affect pro social behavior

References

1. David Krech And Richard S Crutehfield: Theory And Problems Of Social Psychology
2. David Krech And Richard S Crutehfield And Egerton L Ballachey: Individual And Society
3. Kuppuswamy B :Elements Of Social Psychology



HOD
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Course Code	Course Title	L	T	P	C
20160DSC64F	Performance & Reward Management	5	0	0	4

COURSE OBJECTIVES

The course is designed to promote understanding of issues related to the compensation and rewarding human resources in the organizations and to impart skills in designing analyzing and restructuring reward management systems, policies and strategies.

UNIT I: Wage concepts, Theories of Wages, Importance, Wage Policy, Criteria for Wage Fixation, Techniques of Wage Determination. Wage Fixation Machinery, Wage Differentials, and Challenges of Remuneration. Impact of compensation and employees benefit on organizational effectiveness; Economic and Behavioral issues in compensation.

UNIT II: Role of compensation in organization, Determination of Inter and Intra-industry Compensation Differentials, Internal and External Equity in Compensation Systems. Factors influencing compensation levels, compensation as motivational tool, compensation policy.

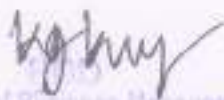
UNIT III: Conventional reward methods and their inadequacies. Developing reward strategy – skill based pay, broad banding, team based pay, payment by results, and performance related pay, variable compensation. Compensation for executives and R&D staff. Reward structure in new industries (BPO, IT, Hospitality, Tourism, etc.), MNCs and other organizations. Remuneration plan and business strategy.

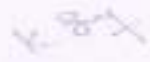
UNIT IV: Profit sharing, payment of bonus. Understanding Different Components of Compensation Packages like Fringe Benefits, Incentives and Retirement Plans, Compensation Practices of Multinational Corporations and Strategic Compensation Systems. Understanding tools in designing, improving and implementing compensation packages

UNIT V: Law relating to payment of wages and bonus in India. Statutory Provisions Governing Different Components of Reward Systems- Working of Different Institutions Related to Reward System like Wage Boards, Pay Commissions, Role of trade unions in compensation management.

SUGGESTED READINGS:

1. Milkovich, Compensation, Tata McGraw-Hill Publishing Company Ltd., New Delhi, 2008.
2. B.D. Singh, Compensation and Reward Management, Excel Books, New Delhi, 2006.
3. Henderson, Richard, I :Compensation Management: Rewarding Performance, PHI
4. Henderson, Compensation Management in a Knowledge Based World, Pearson Education, New Delhi, 9th Edition.


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 THANAVUR-613 403.


 Professor of Management Studies of
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 THANAVUR-613 403

2022 – 2023
VALUE ADDED DIPLOMA AND CERTIFICATE COURSE SYLLABUS



Academic year: 2022-2023
ODD SEMSTER

Course: Diploma in Tax Procedure & Practice
Subject Code: 2261TP

AIMS: To emphasis Better performance than the Overall GST

Objectives:

- This course to provide knowledge of the Indian tax system.
- To provide a basic knowledge on the role of tax laws in constitution.
- To provide a basic knowledge on State Sales Tax act and rules made there under State Sales Tax Procedure and Practice.

OUTCOMES:

To help the students form a clear idea of Managerial Economics. To enable the students, understand determination of price under different market forms. To enable the students, understand the situation of consumer and producer equilibrium. To describe the concept of inflation and its consequences in an economy. To illustrate the calculation of national income.

Unit I: Introduction

Amendment to Constitution and GST - Concept of VAT: Meaning, variants and methods, major defects in the structure of indirect taxes prior to GST - Applicability of GST - Types of GST - Benefits of implementing GST - Goods and Services Tax Council.

Unit II: Definitions under CGST Act

Aggregate turnover - Agriculturist - Business - Business Vertical - capital goods - electroniccommerce operator - fixed establishment - goods - inward supply - Job work - Manufacture - Person - services - supplier.

Unit III: Concept of Supply

Meaning and Scope of Supply under Section 7 of the CGST Act - Inward and Outward Supply - Tax liability under Section 8 - Determination of Nature of Supply under Section 7 of the IGST Act - Intra-state supply under Section 8 of the IGST Act - Activities to be treated as supply even if made without consideration (Schedule I to the CGST Act)

Unit IV: Registration under GST

Persons liable for registration - Aggregate turnover - Persons not liable for registration - compulsory registration cases under Section 24 of the CGST Act - Procedure for registration including verification of the application and approval - Issue of Registration Certificate including Goods and Services Tax Registration Number - cancellation of registration - revocation of cancellation of registration.

Unit V: Composition levy.

Applicability - Rate of tax of the composition levy - Conditions and restrictions for opting for composition levy - Validity of composition levy.

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Academic year: 2022-2023

ODD SEMESTER

Course: CERTIFICATE COURSE IN E-BANKING

Subject Code: 2261EB

AIMS: To emphasize Better performance of E-Banking.

OBJECTIVES:

To help students assimilate knowledge of various digital products in Banking Sector and different Payment Systems in India.
There is a need to understand the New Technologies and Digital Disruptions taking place in transformation of Business Models.

OUTCOME:

1. Understand banking and finance systems in India.
2. Acquaint commercial bank and its product.
3. Build customer relationship in banking sector.
4. Well-verse with e-banking services and internet banking.

Unit - 1

E-Banking: Introduction - Meaning - Definition - Features - use of information technology in banking company - E-Banking channels: Automatic Teller Machine - internet Banking - Tele banking - Mobile banking - IFSC Number.

Unit - 2

ATM: Meaning - Characters - Features - Functions - service available from ATM - Cash Deposit - Cash Withdraw - loan inquiry - Last few transactions - Balance - fund transfer - ticket booking - payments - ATM card - Pin Number.

Unit - 3

Internet Banking: Introduction - World Wide Web - Net banking account opening - Username and Password - secrecy of maintaining One Time Password - Net Banking Services - Fund Transfer - Make Payment.

Unit - 4

National Electronic Fund Transfer (NEFT): Introduction - Meaning - Functions - services. Real Time Gross Settlement (RTGS): Introduction - Meaning - Functions - Service infrastructure requirement - RTGS transactions.

Unit - 5

Security features SFMS: formats of SFMS - SFMS transaction - security aspects - RAS: requirements of RAS - application - security features of RAS - IT Act: legal status - electronic records Cyber crime and law.

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Academic year: 2022-2023
ODD SEMESTER

Course: Certificate Course in Sales & Marketing
Subject Code: 22015M

AIMS: To emphasize Better performance in Sales and Marketing

OBJECTIVES: The objective of the Sales and Marketing course is to gain an understanding to make good decisions to market goods and services in a manner to be able to sell as per targets and a never ending demand for it is created in the marketplace

OUTCOMES:

1. To communicate positively the purpose & objectives of the store to all store team members
2. To explain the importance of effective team communication
3. To understand the concept of team dynamics

UNIT I

Meaning of marketing Management - Functions of Marketing Management - Difference between Marketing Management and Sales Management - Advertising management - Need Importance - Advertising Strategy - Advertisement Copy - Media Planning - Effectiveness of Advertisement

UNIT II

Marketing manager's responsibility - marketing planning - need, importance and process of planning - Marketing control and marketing audit - types and methods of conducting marketing audit - marketing risks - methods of dealing with marketing risks

UNIT III

Sales Management - meaning and scope - functions of sales management - sales policy - selling process - responsibilities of sales manager - AIDA Formula- Need for sales force - recruitment and selection of sales force - training of salesman - qualities of a good salesman

UNIT IV

Sales office functions - interviews - receiving of orders - handling mails - filing - Record keeping - sales bulletin - Sales promotion - Dealer & Consumer sales promotion tools

UNIT V

Sales Planning - Budgeting & Evaluation - Distribution functions - distribution policy components of physical distribution

TEXT BOOKS RECOMMENDED:

1. Dr N.Rajan Nair - Marketing
2. R.S.N. Pillai and Bagavathi - Modern marketing - S Chand
3. Salesmanship and Advertising - Davar
4. Salesmanship - RSN Pillai and Bagavathi
5. Salesmanship and Publicity - JSK Patel.

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Academic year: 2022-2023
ODD SEMESTER

Course: Certificate Course in Investment Management
Subject Code: 22611M

AIMS: To emphasis Better performance in Sales and Marketing.

OBJECTIVES:

- provide an overview of historical trends and innovations in financial instruments and trading processes
- provide an overview of various financial instruments
- provide insight into the use of finance theory in investment management
- provide an overview of historical trends and innovations in financial instruments and trading processes
- provide an overview of various financial instruments
- provide insight into the use of finance theory in investment management

OUTCOMES:

- compare key characteristics of given financial instruments • briefly recall important historical trends in the innovation of markets, trading and financial instruments
- name key facts related to the historical return and risk of bond and equity markets
- relate key facts of the managed fund industry
- define market microstructure and evaluate its importance to investors
- explain the fundamental drivers of diversification as an investment strategy for investors

UNIT I

Investment Management – Nature and scope - Objectives – Process – Investment Media Security and Non-security forms of investment - gilt edged securities – Sources of investment information.

UNIT II

New Issues Market – Methods of issuing – Parties involved in the new issue market – Secondary market – Stock Exchanges – NSE and BSE – Trading mechanism – online trading – SEBI and Investors protection.

UNIT III

Security Analysis – Approaches – Fundamental Analysis – Technical Analysis – Dow Theory – Random Walk Theory – Efficient Market Hypothesis.

UNIT IV

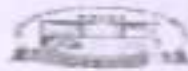
Portfolio Analysis – Traditional and Modern approach – Rationale of Diversification of Investments – Markovitz theory – Sharpe Index Model - Capital Asset Pricing Model.

UNIT V

Investment companies in India – Types Mutual Fund Operations in India – UTI – SEBI and RBI Guidelines for Mutual Funds.

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Academic year: 2022-2023
Course: certificate course in Intelligence for Excellence

Subject Code: 22613E

AIM: To enhance better performance in Intelligence for Excellence

OBJECTIVES:

- The objective is to provide students with a conceptual framework of Event Management, Event Services, Conducting Event and Managing Public Relations.
- To make the students aware about the different events.

OUTCOMES:

- To learn the concepts related to various events.
- Awareness on the process of conducting events.
- Planning and Budgeting of the events.

Intelligence for Excellence

Unit I

Self Intelligence: Intelligence: Definition and Meaning - Intelligence cycle- Self Intelligence: Personality - Strategic thinking - Lateral Thinking- Emotional Intelligence: Self awareness - Motivation - Self regulation- Social awareness - Empathy - Decision making: meaning-methods-types and steps in making effective decision making

Unit II

Multiple Intelligences: Meaning and types of Multiple intelligences- Successful Intelligence: Meaning and types of Successful Intelligence-Creative Intelligence- Practical Intelligence - Analytical Intelligence.

Unit III

Interpersonal Intelligence: Definition- Meaning and development of interpersonal intelligence - Interpersonal intelligence and career advancement: Negotiation: Definition and meaning - Principles involved in negotiation - methods of negotiation: Conflict: Definition and meaning - sources of conflicts - types of conflicts - conflict management; Change: Definition and meaning - Types of change - Handling of change - Balancing work and Life

Unit IV

Social Intelligence: Meaning and Development of Social Intelligence- Situation- Presence - Authenticity - Clarity-Empathy -Spiritual Intelligence: Meaning-Competencies and skills of spiritual intelligence

Unit V

Environmental Intelligence: Understanding and caring of Natural Resources- Food- Land-Forest-Mineral- Water and Energy- Pollution: Types: Air Pollution, Water Pollution, Noise Pollution, Thermal and Radiation; Specific Absorption Rate (SAR) values; Issues affecting environment: Population growth - Deforestation- Globalization - Sustainable development: meaning, process, concrete action plans for sustainability

TEXT BOOK:

1. Karl Albrecht(2006), " Social intelligence: The new science of Success "; John Wiley & Sons.
2. Robert J Sternberg(2000), " Successful Intelligence "; Magna Publishing Co Ltd.

REFERENCE BOOK:

1. Daniel Goleman(1995), " Emotional Intelligence "; Bantam Books.
2. Dorothy A Sisk and Dr Paul Torrence(2001), " Spiritual Intelligence"; Creative Education Foundation.

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WISDOM BETTER KNOWLEDGE

Academic year: 2022-2023
Course- Certificate Course in Internet of Things
Subject Code: 2261IT

AIMS: To enhance better performance in internet things

COURSE OBJECTIVES

- To help students understand the intricacies of Internet things
- To familiarize them with financial concepts and economic issues.
- To train students in the techniques of business reporting.

OUTCOMES:

- Students will be able to develop an appropriate portfolio for a given investor and market conditions.
- Students will be able to use adjusted financial statements to produce a sound valuation of a company.

Unit I:

IoT Concepts

Introduction and meaning - definition - Fundamentals - importance - objectives - need - How IoT is used - Emergence of IoT - advantages and disadvantages of IoT, Technologies that led to emergence of IoT.

Unit II:

Security, Privacy and Challenges in Internet of Things

Design Challenges - Development Challenges - Security Challenges - Privacy challenges - Other challenges - Trust management.

Unit III: Emergence of IoT and New Applications

Emergence of IoT - Home - Healthcare - Agriculture - Military - Politics - Construction - other Areas - Relevance of IoT for the future: IoT in everyday life - Internet of Everything - IoT and Individual Privacy.

Unit IV:

Smart city using IoT Integration

Smart city - emergence - dimensions - adoption for automation - design strategies - factors - IoT for smart cities (case study Smart city Barcelona).

Unit V:

IoT in Indian scenario

Emergence of IoT in India - IoT and Aadhar - IoT for health services - IoT for financial inclusion - IoT for rural empowerment.

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SCHOOL OF ARTS AND SCIENCE
DEPARTMENT OF BIOTECHNOLOGY
Minutes of Board of Studies Meeting

The Board of Studies meeting for the Department of Biotechnology is held on 05.04.2022 at 12.30 p.m. in, PRIST Deemed to be University, Thanjavur under the chairmanship of Dr. P. Arjun

The following members were present:

1. Dr. P. Arjun, Associate Professor (Chairperson, BOS)
2. Dr. I. Chinnappa / Dean (Special Invitee)
3. Dr. P. Manonmani, Professor (Member, BOS)
4. Dr. Arjun Pandian, Associate Professor, (Member, BOS)
5. Dr. C. Anushia, Associate Professor (Member, BOS)
6. Dr. A. Shajahan, Assistant Professor (Member, BOS)
7. Dr. G. Venkatkumar, Assistant Professor (Member, BOS)
8. Dr. R. V. Shalini, Assistant Professor (Member, BOS)
9. Dr. J. Sebastianraj, Associate Professor, Department of Biotechnology, Jamal Mohamed College, Tiruchirappalli, Tamil Nadu (External Member, BOS)
10. Dr. P. Arulselvam, Managing Director, Scigen Research and Innovation PVT., LTD., Vallam, Thanjavur, Tamil Nadu (External Member, BOS)
11. Mr. P. Sri Ramji, M. Sc., Special Invitee Alumna, Tower Technician, ATC, Trichy
12. Ms. B. Vincy, M. Sc Biotechnology, PRIST Deemed to be University, Thanjavur

The Chairman of the Board of Studies for UG and PG in Biotechnology welcomed the members. Members analyzed the feedback from various stakeholders and the follow up actions taken. Feedback from alumni that self-learning can be given to students will be taken into consideration when the curriculum is due for change.

The chairman briefed about the programmes and the curriculum. The committee carefully reviewed the curriculum and suggested as below.


The Meeting concluded with thanks from Board of Studies Chairman.
Head of the Department
Department of Biotechnology
School of Arts & Science
Prist Deemed to be University, Thanjavur.


Dean of Arts & Science
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Thanjavur - 613 403, Tamilnadu.



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Department of Biotechnology

Composition of Board of Studies 2022-2023

S.No.	Designation	Name	Qualification	Designation & Affiliation	Mail id
1	Chairperson/HoD	Dr. P. Arjun	M.Sc., Ph.D	Associate Professor, Department of Biotechnology, PRIST Deemed to be University, Vallam, Thanjavur.	arjunpandian@prist.ac.in
2	External Expert-Academic	Dr. J. Sebastianij	M.Sc., M. Phil., Ph.D	Associate Professor, Department of Biotechnology, Jamal Mohamed College, Tiruchirappalli, Tamil Nadu	sebastianraj@gmail.com
3	External Expert- Industry	Dr. P. Arulselvam	M.Sc., Ph.D	Managing Director, Scigen Research and Innovation PVT., LTD., Vallam, Thanjavur, Tamil Nadu.	arulbie@gmail.com
4	Professor	Dr. P. Manonmani	M.Sc., Ph.D	Professor, Department of Biotechnology, PRIST Deemed to be University, Vallam, Thanjavur.	manonmani@prist.ac.in
5	Associate Professor	Dr. C. Anushia	M.Sc., Ph.D	Associate Professor, Department of Biotechnology, PRIST Deemed to be University, Vallam, Thanjavur.	anushia@prist.ac.in
6	Assistant Professor	Dr. A. Shujahan	M.Sc., Ph.D	Assistant Professor, Department of Biotechnology, PRIST Deemed to be University, Vallam, Thanjavur.	shajahan@prist.ac.in
7	Assistant Professor	Dr. G. Venkatarunur	M.Sc., Ph.D	Assistant Professor, PRIST Deemed to be University, Vallam, Thanjavur.	venkatarunur@prist.ac.in
8	Assistant Professor	Dr. R.V. Shalini	M.Sc., Ph.D	Assistant Professor, PRIST Deemed to be University, Vallam, Thanjavur.	shalini@prist.ac.in
9	Assistant Professor	Dr. J. Ilamathi	M.Sc., Ph.D	Assistant Professor, PRIST Deemed to be University, Vallam, Thanjavur.	ilamathi@prist.ac.in
10	Special Invitee-Dean	Dr. L. Chinnappa	M.Sc., M. Phil., Ph.D	Dean, School of Arts and Science, PRIST Deemed to be University, Vallam, Thanjavur.	deanarts@prist.ac.in
11	Special Invitee-Alumnus/Alumna	Mr. P. Sri Ramji	M.Sc.,	Tower Technician, ATC, Trichy	ramji@prist.ac.in
12	Special Invitee -Current student - UG or PG	Ms. B. Vincy	M.Sc.,	Student	vincy@prist.ac.in

P. Arjun

Head of the Department
Department of Biotechnology
School of Arts & Science
PRIST Deemed to be University, Thanjavur.

Vincy

Dean of Arts & Science
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Thanjavur - 613 403, Tamil Nadu

Signature of the Chairman & Members

1. Dr. Arjun Pandian	P. Arjun
2. Dr. L. Chinnappa/ Denn	L. Chinnappa
3. Dr. P. Manonmani	P. Manonmani
4. Dr. C. Anushia	C. Anushia
5. Dr. A. Shajahan	A. Shajahan
6. Dr. G. Venkat Kumar	G. Venkat Kumar
7. Dr. R. V. Shalini	R. V. Shalini
8. Dr. J. Ilamathi	J. Ilamathi
9. Dr. J. Sebastinraj	J. Sebastinraj
10. Dr. P. Arulselvam	P. Arulselvam
11. Mr. P. Sri Ramji	P. Sri Ramji
12. Ms. B. Viney	B. Viney

Department of Biotechnology
Minutes of the Board of Studies

The Board of Studies meeting was held on 04.05.2022. The Chairman DR. ARJUN PANDIAN welcomed the members of the Board of studies and outlined the changes to be made in the following for the board approval.

Item 1. To consider changes in the Curriculum and Syllabi of Bsc Biotechnology, course and approval.

Item 2. To suggest the panel of names for appointment of examiners.

Item 3. Other academic activities in the department.

As per the suggestions and recommendations given by the Stakeholders on the above items discussed, the existing/revised Scheme of Curriculum/Scheme of Examination syllabi and Panel of Examiners is to be followed is annexed herewith for the implementation from the commencement of the Academic year 2020-2021. The Regulations and Syllabus for B.Sc, Biotechnology, M.Sc Biotechnology Courses were discussed in the BOS.

The members after careful scrutiny of the changes to be made unanimously accorded approval for the proposed changes/modifications. They also resolved to authorize the Chairman of Board of Studies to place the changes/modifications now approved by the BOS before the Standing Committee on Academic affairs and Academic Council.

Agendum 1: Confirmation of the previous Meeting Minutes

Discussion: Minutes of the previous meeting were confirmed and accepted.

Resolution: The coordinator read the minutes of earlier meeting and the minutes were reviewed and passed by the members.

Agendum 2: Action taken on the previous Meeting Minutes

Discussion: The details of the action taken were presented to the members

Resolution: The members expressed satisfaction over the action taken

Agendum 3: To scrutinize the stakeholder feedback on UG, PG curriculum

Discussion: 1. More courses covering the entrepreneurship should be offered
2. advanced topics to be introduced Fundamental of Biological system paper in BSc syllabus
3. More advanced papers should be added in BSc programme

Resolution: The board unanimously resolved to make necessary changes as requested by the stakeholders

Agendum 4: To consider the inclusion of audit course in the curriculum

Discussion:

Resolution: The members of the board resolved to approve the continuation of audit course in the curriculum

Agendum 5: To consider the introduction of employment oriented add on courses

Discussion: The existing syllabus gives enough opportunity for employability and there was no urgent need to introduce new add on courses. Also, it was pointed out that, the syllabus should be revised compulsorily if the university decides to offer 4 year BSc programme according to New Education Policy 2022

Resolution: Resolved to introduce some more employment oriented add on courses in the next BOS meeting

Agendum 6: To recommend the panel of examiners for BSc, MSc programme Bsc.

Discussion: Members suggested the names of the experts who would serve as a panel of examiners for different programs.

Resolution: The BOS approved a tentative list of subject experts for paper setting, moderation and examiners (attached as annexure), if required few more experts may be included with the permission of the concerned authorities.

Agendum 7:

Review of curriculum & syllabus in Bsc biochemistry-regulation-2022

Discussion

- To discuss the modifications in the syllabi for First- Bsc Microbiology allied Biochemistry Syllabus.
- As such, the curriculum is revisited and certain sweeping changes have been made - by introducing new courses and improvising the syllabi of many courses. The honorable members Board of Studies has expressed their appreciations for the changes made commenting that they address the current demands of the Industry-Profession.

Resolution:

Resolved to Improvements in Course Contents of the following paper

Course Title	Category	Introduced in
22117AEC14- Fundamentals of Biotechnology	Core Theory	I semester
22117AEC15L- Fundamentals of Biotechnology Lab-I	Core Practical	I semester

The following new courses are introduced in the curriculum BSC Biotechnology:

Course Title	Category	Introduced in
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The following new courses are introduced in the curriculum B.Sc., and M.Sc., Biotechnology regulation 2022


S.No	Programme Name	Year Of Introduction	Course Code	Course Name
1	B.Sc.,BIOTECHNOLOGY	2022	22117AEC13	Fundamentals of Biotechnology
2	B.Sc.,BIOTECHNOLOGY	2022	22116AEC14	Microbiology - I
3	B.Sc.,BIOTECHNOLOGY	2022	22117AEC15L	Fundamentals of Biotechnology Lab
4	B.Sc.,BIOTECHNOLOGY	2022	22116AEC16L	Microbiology Lab-I
5	B.Sc.,BIOTECHNOLOGY	2022	22116AEC24	Microbiology-II
6	B.Sc.,BIOTECHNOLOGY	2022	22116AEC26L	Microbiology Lab-II
7	B.Sc.,BIOTECHNOLOGY	2022	22115AEC34	Biochemistry-I
8	B.Sc.,BIOTECHNOLOGY	2022	22115AEC36L	Biochemistry Lab-I
9	B.Sc.,BIOTECHNOLOGY	2022	20115AEC44	Biochemistry-II
10	B.Sc.,BIOTECHNOLOGY	2022	20115AEC46L	Biochemistry Lab-II
11	B.Sc.,BIOTECHNOLOGY	2022	22117DSC54C	The Science of Stem Cells
12	B.Sc.,BIOTECHNOLOGY	2022	22117DSC54D	Patenting in Biotechnology
13	B.Sc.,BIOTECHNOLOGY	2022	22117DSC54E	Renewable Energy
14	B.Sc.,BIOTECHNOLOGY	2022	22117DSC54F	Molecular Docking
15	B.Sc.,BIOTECHNOLOGY	2022	22117DSC54G	Medicinal science
16	B.Sc.,BIOTECHNOLOGY	2022	22117DSC54H	Clinical Engineering
17	B.Sc.,BIOTECHNOLOGY	2022	22117DSC54I	Clinical Research
18	B.Sc.,BIOTECHNOLOGY	2022	22117DSC63C	Tools in Biostatistics
19	B.Sc.,BIOTECHNOLOGY	2022	22117DSC63D	Experimental Biotechnology
20	B.Sc.,BIOTECHNOLOGY	2022	22117DSC63E	Genetics and Society
21	B.Sc.,BIOTECHNOLOGY	2022	22272E25D	System Biology and Biotechnology
22	B.Sc.,BIOTECHNOLOGY	2022	22117DSC63F	Cell Culture

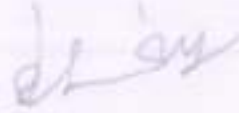
				Technique
1	B.M.Sc., BIOTECHNOLOGY	2022	2221705C21	Cell & Molecular Biology
2	B.M.Sc., BIOTECHNOLOGY	2022	2221705C15C	Forensic Identification
3	B.M.Sc., BIOTECHNOLOGY	2022	2221705C15D	Co-operative Education
4	B.M.Sc., BIOTECHNOLOGY	2022	2221705C15E	Computer Security and Computer Forensic
5	B.M.Sc., BIOTECHNOLOGY	2022	2221705C15F	Power System Simulation Laboratory
6	B.M.Sc., BIOTECHNOLOGY	2022	2221705C25C	Chemical Biotechnology
7	B.M.Sc., BIOTECHNOLOGY	2022	2221705C25D	Food Industry Roles and Responsibilities
8	B.M.Sc., BIOTECHNOLOGY	2022	2221705C25E	Artificial Intelligence
9	B.M.Sc., BIOTECHNOLOGY	2022	2221705C25F	Mathematics for Life Sciences
10	B.M.Sc., BIOTECHNOLOGY	2022	2221705C34F	Ecology
11	B.M.Sc., BIOTECHNOLOGY	2022	2221705C34G	Biochemical Pathways
12	B.M.Sc., BIOTECHNOLOGY	2022	2221705C34H	Animal Health
13	B.M.Sc., BIOTECHNOLOGY	2022	2221705C34F	Translational Biology and Molecular Medicine
14	B.M.Sc., BIOTECHNOLOGY	2022	2221705C44C	Biotherapeutics
15	B.M.Sc., BIOTECHNOLOGY	2022	2221705C44D	Live Stock Production & Management
16	B.M.Sc., BIOTECHNOLOGY	2022	2221705C44E	Veterinary Medicine

22117DSC63B- Pharmaceutical Biotechnology	Core Theory	VI semester
<p>Dr. K. Arul selvan proposed to included problem based questions for post graduate students</p> <p>Members of the Board updated the panel of examiners and submitted the same to the Academic Counsel for its approval.</p>		

<p>Agendum 8: Submission of project proposals for Faculty Development Programs, Major, Minor Research projects and conference/ seminar/ workshop</p> <p>Discussion: The external members recommended that faculty members and students should also apply for these types for projects to enhance research output of the department.</p> <p>Resolution: Resolved to insist faculty-members to submit proposals for Major-Minor research projects to different funding Agencies during academic year.</p>
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Other Academic Activities: The students should complete a SWAYAM-MOOC before the completion of the 6th semester and the course completed certificate should be submitted to the HoD.

Signature: 
 Chair HoD.
 Dept: Bio Technology
 Name: DR. ARJUN PANDIAN
 Date: 04.05.2022

Signature: 
 Dean:
 School: Arts and Science
 Name: DR. C. CHINNAPPA
 Name: Dr. C. Chinnappa, Ph.D., M.Tech, Ph.D.
 Date: 4.05.2022
 PRIST Deemed to be University
 Thanjavur - 613 405, Tamilnadu.

Mandatory Attachments:

1. Minutes of the previous BoS meeting minutes and report on the follow-up action taken.
2. BoS Meeting 'Notification' sent to all members, including online meeting link.
3. Online Screenshots and geo-tagged photos in the venue.
4. Attendance sheet print of online attendees.
5. Detailed syllabi with PEOs, POs, COs, etc. (in Annexures), if new Programme(s) introduction /Curriculum revision is discussed.

Note: The 'minutes' of the BoS meeting along with the attachments as listed above must be mailed to the Registrar by the HoD within three days after the meeting, copying Dean concerned, Dean - Academic Affairs and the VC's office.

Annexure II - Revised Value added courses

1. Certificate course in MLT
2. Certificate course in Spirulina Cultivation
3. Diploma course in Fermentation Technology
4. Certificate Course in Aquaculture Technology
5. Certificate course in 3D BioPrinting
6. Certificate course in Renewable energy



HOD

Head of the Department
Department of Biotechnology
School of Arts & Science
Prist Deemed to be University, Thanjavur



DEAN

Dean of Arts & Science
PRIST Deemed to be University
Thanjavur - 613 002, Tamil Nadu



SCHOOL OF ARTS AND SCIENCE

DEPARTMENT OF BIOTECHNOLOGY

B.Sc., BIOTECHNOLOGY REGULATION -2022

COURSE STRUCTURE

SEMESTER-I					
Course Code	Course Title	L	T	P	C
THEORY					
22110AEC11/ 22111AEC11/ 22132AEC11/ 22135AEC11	Language-I(Tamil-I/ Advanced English-I/ Hindi-I/ French-I)	4	0	0	2
22111AEC12	English-I	4	0	0	2
22117AEC13	Fundamentals of Biotechnology	6	1	0	5
22116AEC14	Microbiology -I	6	1	0	4
PRACTICAL					
22117AEC15L	Fundamentals of Biotechnology Lab	0	0	3	2
22116AEC16L	Microbiology Lab-I	0	0	3	2
	Total	20	2	6	17
AUDIT COURSE					
221ACL5ICN	Indian Constitution	0	0	0	2
221ACLSUHV	Universal Human Values	0	0	0	2
SEMESTER-II					
Course Code	Course Title	L	T	P	C
THEORY					
22110AEC21/ 22111AEC21/ 22132AEC21/ 22135AEC21	Language-II(Tamil-II/ Advanced English-II/ Hindi-II/ French-II)	4	0	0	2
22111AEC22	English-II	4	0	0	2
22117AEC23	Cell Biology and Genetics	6	1	0	5
22116AEC24	Microbiology-II	6	1	0	4
PRACTICAL					
22117AEC25L	Cell Biology and Genetics Lab	0	0	3	2
22116AEC26L	Microbiology Lab-II	0	0	3	2
RESEARCH SKILL BASED COURSE					
22117RLC27	Research LED Seminar	-	-	-	1
	Total	20	2	6	18
221ACLSCOS	Communication Skills	-	-	-	2
221ACSSBBE	Basic Behavioral Etiquette	-	-	-	2

SEMESTER-III						
Course Code	Course Title	L	T	P	C	
THEORY						
22110AEC31/ 22111AEC31/ 22132AEC31/ 22135AEC31	Language-III(Tamil-III/ Advanced English-III/ Hindi-III/ French-III)	4	0	0	2	
22111AEC32	English-III	4	0	0	2	
22117AEC33	Immunology	4	1	0	4	
22115AEC34	Biochemistry-I	4	1	0	5	
PRACTICAL						
22117AEC35L	Immunology Lab	0	0	3	2	
22115AEC36L	Biochemistry Lab-I	0	0	3	2	
RESEARCH SKILL. BASED COURSE						
22117RMC37	Research Methodology	2	0	0	2	
	Total	18	2	6	19	
AUDIT COURSE						
221ACLSOAN	Office Automation	-	-	-	2	
SEMESTER-IV						
Course Code	Course Title	L	T	P	C	
THEORY						
22110AEC41/ 22111AEC41/ 22132AEC41/ 22135AEC41	Language-IV(Tamil-IV/ Advanced English-IV/ Hindi-IV/ French-IV)	4	0	0	2	
22111AEC42	English-IV	4	0	0	2	
22117AEC43	Animal Physiology	4	1	0	4	
22117AEC44	Molecular Biology	5	1	0	5	
221ENSTU45	Environmental studies	2	0	0	2	
PRACTICAL						
22117AEC46L	Animal Physiology Lab	0	0	3	2	
22117AEC47L	Molecular Biology Lab	0	0	3	2	
	Total	19	2	6	17	
AUDIT COURSE						
221ACLSLMS	Leadership and Management Skills	-	-	-	2	
221ACSSAQA	General Aptitude and Quantitative Ability	-	-	-	2	
SEMESTER-V						
Course Code	Course Title	L	T	P	C	
THEORY						
22117AEC51	Food and Agricultural Biotechnology	4	1	0	4	
22117AEC52	Cell and Tissue Culture	4	1	0	3	
22117AEC53	Industrial Biotechnology	4	1	0	4	
22117DSC54_	Discipline Specific Elective-I	4	1	0	3	

PRACTICAL					
22117AEC55L	Food and Agricultural Biotechnology, Tissue Culture Lab	0	0	3	2
22117AEC56L	Industrial Biotechnology Lab	0	0	3	2
RESEARCHSKILLBASEDCOURSE					
22117BRC57	Participation in Bounded Research	-	-	-	
	Total	16	4	6	19
AUDIT COURSE					
221ACLSPSL	Professional Skills	0	0	0	2
SEMESTER-VI					
Course Code	Course Title	L	T	P	C
THEORY					
22117AEC61	Plant and animal Biotechnology	4	1	0	4
22117SEC62	Applied Biotechnology	4	1	0	5
22117DSC63	Discipline Specific Elective - II	4	1	0	3
221-DEC(2DIGIT COURSE Name)	Open Elective	4	0	0	2
PRACTICAL					
22117SEC64L	Plant and Animal Biotechnology Lab	0	0	3	2
22117AEC65L	Applied Biotechnology Lab	0	0	3	2
22117PRW66	Project Work	-	-	-	4
22117PROPEE	Programme Exit Examination	-	-	-	1
	Total	16	3	6	23
AUDITCOURSE					
221ACSSIST	Interview Skills Training and Mock Test	-	-	-	2
221ACLSCET	Community Engagement	-	-	-	1
Total Credits for the Programme					115
Total Credits-Audit Courses					19

Head of the Department
Department of Biotechnology
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Discipline Specific Electives

Semester	Discipline Specific Elective Courses-I
V	a) 22117DSC54A – Bioinformatics and Biostatistics b) 22117DSC54B – rDNA Technology c) 22117DSC54C – The Science of Stem Cell d) 22117DSC54D – Patenting in Biotechnology e) 22117DSC54E – Renewable Energy f) 22117DSC54F – Molecular Docking g) 22117DSC54G – Medicinal science h) 22117DSC54H – Clinical Engineering i) 22117DSC54I – Clinical Research
	Discipline Specific Elective Courses-II
VI	a) 22117DSC63A – Environmental Biotechnology b) 22117DSC63B – Pharmaceutical Biotechnology c) 22117DSC63C – Tools in Biostatistics d) 22117DSC63D – Experimental Biotechnology e) 22117DSC63E – Genetics and Society f) 22117DSC63F – System Biology and Biotechnology g) 22117DSC63G – Cell Culture Technique

Open Electives

Semester	Open Elective Courses
VI	a) 221TNOEC-Tamil Ilakkiya Varalara b) 221ENOEC-Journalism c) 221MAOEC-Development of Mathematical skill d) 221PHOEC-Instrumentation e) 221CEOEC-Food and Adulteration f) 221CSOEC – E-Learning g) 221CAOEC-Web Technology h) 221CMOEC-Banking service

Credit Distribution

Sem	AEC	SEC	DSC	OEC	Research	Others	Total
I	17	-	-	-	-	-	17
II	17	-	-	-	1	-	18
III	17	-	-	-	2	-	19
IV	17	-	-	-	-	2	19
V	15	-	9	-	1	-	25
VI	6	7	7	2	4	1	27
Total	89	7	15	2	8	3	125

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 Department of Biotechnology
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Dr. V. S. Srinivasan

Dean of Arts & Science
 Priet Deemed to be University
 Thanjavur - 613 403, Tamil Nadu



SCHOOL ARTS AND SCIENCE

DEPARTMENT OF BIOTECHNOLOGY

M.Sc., BIOTECHNOLOGY- REGULATION 2022

COURSE STRUCTURE

Course Code	Course Title	L	T	P	C
SEMESTER I					
22217SEC11	General Microbiology	6	1	0	5
22217SEC12	Molecular Genetics	6	1	0	5
22217SEC13	Biochemistry	6	1	0	4
22217SEC14L	Microbiology & Molecular Genetics – Lab	0	0	4	2
22217DSC15	Discipline specific elective I	5	0	0	4
22217RLS16	Research Led Seminar	-	-	-	1
	Total	23	3	4	21
SEMESTER II					
22217SEC21	Cell & Molecular Biology	5	1	0	5
22217SEC22	Biophysics & Bioinformatics	5	1	0	5
22217SEC23	Industrial Biotechnology	5	0	0	4
22217SEC24L	Molecular Biology & Industrial Biotechnology Lab	0	0	4	2
22217DSC25	Discipline specific elective II	5	0	0	4
22217RMC26	Research Methodology	3	0	0	2
22217BRC27	Participation in Bounded Research	-	-	-	2
	Total	23	2	4	24
SEMESTER III					
22217SEC31	Genomics	6	1	0	6
22217SEC32	Proteomics	6	1	0	6
22217SEC33L	Genomics & Proteomics - Lab	0	0	5	3
22217DSC34	Discipline specific elective III	5	0	0	4
222 OEC	Open Elective	4	0	0	3
22217SRC35	Design/socio technical research	-	-	-	2
	Total	21	2	5	24
SEMESTER IV					
22217SEC41	Food Technology	6	1	0	6
22217SEC42	Bio instrumentation	6	1	0	6
22217SEC43L	Food technology and Bio instrumentation lab	0	0	5	3
22217DSC44	Discipline specific elective IV	5	0	0	4
22217PRW45	Project work	-	-	-	6
22217PEE	Programme Exit Examination	-	-	-	2
	Total	17	2	5	27
	Total Credits for the Programme				96

Discipline specific Electives

Semester	Discipline specific Elective Courses-I
I	a) 22217DSC15A- Immunology b) 22217DSC15B- Biosafety and biodiversity c) 22217DSC15C- Forensic Identification d) 22217DSC15D- Co-operative Education e) 22217DSC15E- Computer Security and Computer Forensic f) 22217DSC15F- Power System Simulation Laboratory
	Discipline specific Elective Courses-II
II	a) 22217 DSC25A- Endocrinology b) 22217 DSC25B- Bioethics and IPR c) 22217DSC25C- Chemical Biotechnology d) 22217DSC25D- Food Industry Roles and Responsibilities e) 22217DSC25E- Artificial Intelligence f) 22217DSC25F- Mathematics for Life Sciences
	Discipline specific Elective Courses-III
III	a) 22217 DSC34A- Nanobiotechnology b) 22217 DSC34B- Environmental biotechnology c) 22217DSC34C- Ecology d) 22217DSC34D- Biochemical Pathway e) 22217DSC34E- Animal Health f) 22217DSC34F- Translational Biology and Molecular Medicine
	Discipline specific Elective Courses-IV
IV	a) 22217 DSC44A- Gene therapy utilization pharmacology b) 22217 DSC44B- Plant conservation & disaster management c) 22217DSC44C- Biotherapeutics d) 22217DSC44D- Live Stock Production & Management e) 22217DSC44E- Veterinary Medicine

Open Electives

Semester	Open Elective Courses
III	a) 222ENOEC- Writing for the media b) 222MAOEC- Applicable Mathematics Techniques c) 222PHOEC- Bio-Medical Instrumentation d) 222CHOEC- Green Chemistry e) 222CSOEC - M-Marketing f) 222CMOEC- Financial Services

Credit Distribution:

Sem	SEC	DSC	OEC	RSB Courses	Others	Total
I	16	6	-	1	-	23
II	16	6	-	4	-	26
III	15	6	3	2	-	26
IV	15	5	-	6	2	28
Total	62	23	3	13	2	103


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 Department of Biotechnology
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THE SCIENCE OF STEM CELL

Course Code	Course Title	L	T	P	C
22117DSC54C	THE SCIENCE OF STEM CELL	4	1	0	3

Course Objective: The objective of this paper is to familiarize the students with stem cell technology and its applications for betterment of the society. The course is designed to give a broad view of mammalian stem cells, reviewing where they are found in the body, the different types and how they are cultured. The topics will cover the basic biology of these stem cells as well as bioengineering and application of these stem cells to potential treatments of human diseases.

Module I: Introduction to stem cells

Definition, properties, proliferation, culture of stem cells, medical applications of stem cells, ethical and legal issues in use of stem cells.

Module II: Types of stem cells.

Stem Cell biology and therapy, types embryonic stem cell, Adult stem cell, Stem Cell Biology and Therapy, Embryonic Stem Cells, culture and the potential benefits of stem cell technology

Module III: Therapeutic applications of stem cells

Gene Therapy: Introduction, History and evolution of Gene therapy, optimal disease targets, Failures and successes with gene therapy and future prospects, Genetic Perspectives for Gene Therapy, Gene Delivery methods: Viral vectors and Non-viral Vectors

Module IV: Ethical Issues associated with stem cell-based regenerative medicine field Regulatory and Ethical Considerations of stem cell and Gene Therapy, Assessing Human Stem Cell Safety, Use of Genetically Modified Stem Cells in Experimental Gene Therapies.

Text & References:

- Stem Cell Biology, Daniel Marshak, Richard L. Gardener and David Gottlieb, Cold Spring Harbour Laboratory Press
- Stem Cell and Gene-Based Therapy: Frontiers in Regenerative Medicine, Alexander nBattler, Jonathan Leo, Springer,

References:

- Stem Cell Biology and Gene Therapy. Quesenberry PJ, Stein GS, eds, (£65.00.) Wiley, 1998.
- Progress in gene therapy, Volume 2, Pioneering stem cell/gene therapy trials, Roger Bertolotti, Keiya

PATENTING IN BIOTECHNOLOGY

Course Code	Course Title	L	T	P	C
22117DSC54D	PATENTING IN BIOTECHNOLOGY	4	1	0	3

MODULE 1:

Basic Concepts of Patenting

MODULE 2:

Creating a Patent Landscape

MODULE 3:

How to Patent Biotechnology Inventions?

MODULE 4:

Patenting Small Chemicals and Compounds

MODULE 5:

How IPR is Helping in Growth of the organization

Reference books:

- Alexandra George (2006) Globalisation and Intellectual Property, Ashgate publishing company
- Colin Ratledge and Bjorn Kristiansen Basic Biotechnology, Cambridge University Press- 2nd Ed,2001
- David Pressman (2016) Patent It Yourself 18th edition, Nolo Publishers
- Maarten Bode, (2008) Taking traditional knowledge to the market, Orient Longman Publisher
- Poornima M Charanthmath, "Entrepreneurship Development – small Business Enterprises", Pearson Education – 2005
- Prabudha Ganguly, (2001) Intellectual Property rights- unleashing the knowledge economy, Tata McGraw Hill Publishing Company Ltd.
- Sudeep Chaudhuri (2005), the WTO and India's Pharmaceutical industry, Oxford University Press.
- Vandana Shiva (2002), Protect or Plunder? Understanding Intellectual Property Rights, Zed Books.

RENEWABLE ENERGY

Course Code	Course Title	L	T	P	C
22117DSC54E	RENEWABLE ENERGY	4	1	0	3

Unit I: ENERGY

Solar Radiation Flat Plate and Concentrating Collectors, Solar Direct Thermal Applications, Solar Thermal Power Generation, Fundamentals of Solar Photo Voltaic Conversion, Solar Cells, Solar PV Power Generation, Solar PV Applications. Wind Energy Estimation, Types of Wind Energy Systems

Unit II: Fuel Technology

Principles of combustion, Solid, Liquid and Gaseous fuels, Coal as source of energy and chemicals, Coal preparation, Carbonization, Gasification and Liquefaction of coal and lignite

Unit III: Thermo-chemical conversions:

Direct Combustion, Technology of Biomass gasification, Pyrolysis and Liquefaction, Bio-Chemical Conversion: anaerobic digestion, alcohol production from biomass, Chemical conversion process: hydrolysis and hydrogenation

Unit IV: Biomass Gasifiers:

History, Principle, Design of Biomass Gasifiers, updraft gasifier, down draft gasifier, zero carbon biomass gasification plants

Unit V: Bio-Energy Systems with Efficient Applications:

Traditional Stoves, Energy Efficient Cooking and Space heating Stoves, Metal Stoves Improved Gasifier Stoves,

Text Books:

1. Renewable energy resources: Tiwari and ghosal, Narosa publication.
2. Non conventional Energy Sources, Khanna Publication

Reference Books:

1. Renewable Energy Sources: Twidell & Weir, CRC Press.
2. Solar Energy/ S.P. Sukhatme, Tata McGraw-Hill.
3. Non Conventional Energy Systems; K M. Mittal, A H Wheeler Publishing Co Ltd.
4. Renewable Energy Technologies; Ramesh & Kumar, Narosa publication.
5. Biomass Energy, Oxford & IBH Publication Co.

MOLECULAR DOCKING

Course Code	Course Title	L	T	P	C
22117DSC54F	MOLECULAR DOCKING	4	1	0	3

COURSE OBJECTIVE

- To learn various software and tools for computer-aided drug designing.
- To make students understand the essential features of the interdisciplinary field of science
-

UNIT I: Drug Discovery

Historic development of drug discovery, Modern drug discovery, Molecular modelling-drug targets discovery-target identification, principles of drug ability, Role of Bioinformatics in drug design

UNIT II: Molecular Mechanics

Basic Chemistry Review & Drug Discovery - Bio-molecular Structure & their Molecular Interactions and Recognition - Introduction to Methods in 3-D Structure Determination

UNIT III: Drug – Receptor interaction

Molecular basis of drug action: Drug Receptor Interaction: Basic ligand concept, agonist, antagonist, partial agonist, inverse agonist, Drug receptor concepts.

UNIT IV: Drug design

Prediction of binding site and virtual screening, Drug design -Structure-based drug design, Ligand based drug design, De novo ligand design, Molecular docking-search algorithm, scoring functions, ADMET properties.

UNIT V: Molecular Docking

Methods and Tools in Computer-aided molecular design, Molecular Docking- searching Methods – Scoring function-Protein ligand interaction- Docking using AUTODOCK- Pitfalls in docking

REFERENCES

1. D. Baxivanis and Foulette - Bioinformatics: A Practical Guide to the Analysis of Genes and Proteins, Wiley Indian Edition, 2001.
2. T K Attwood, D J parry-Smith, Introduction to Bioinformatics, Pearson Education, 1st Edition, 11th Reprint 2005.
3. A. R. Leach - Molecular Modeling Principles and Application, 2nd edition, Longman, Publications, 1996.

MEDICINAL SCIENCE

Course Code	Course Title	L	T	P	C
22117DSC54G	MEDICINAL SCIENCE	4	1	0	3

UNIT 1

Organ function tests—liver, kidney, thyroid Protein synthesis. Vitamins and minerals. Restriction fragment length. polymorphism (RFLP). Polymerase chain reaction (PCR). Radio-immunoassays (RIA).

UNIT 2

Inflammation and repair, disturbances of growth and cancer, Pathogenesis and histopathology of rheumatic and ischaemic heart disease and diabetes mellitus.

UNIT 3

Diseases caused by and laboratory diagnosis of — Meningococcus, Saimonella, Shigella, Herpes, Dengue, Polio, HIV/AIDS, Malaria, E. Histolytica, Giardia, Candida, Cryptococcus, Aspergillus.

UNIT 4

Mechanism of action and side effects of the following drugs: Antipyretics and analgesics, Antibiotics, Antimalaria, Antikala-azar, Antidiabetics

UNIT 5

Principles, methods approach and measurements of Epidemiology., Nutrition, nutritional diseases/diorders and Nutrition Programmes. Health information Collection, Analysis and Presentation.

REFERENCES

1. Ganong; Guyton and A.K. Jain book
2. Essentials of Medical Pharmacology K D Tripathi
3. Essentials of Forensic medicine and Toxicology Dr. K S Narayan Reddy
4. General Medicine textbook of medicine S N Chugh

CLINICAL ENGINEERING

Course Code	Course Title	L	T	P	C
22117DSC54H	CLINICAL ENGINEERING	4	1	0	3

COURSE OBJECTIVES:

- This course will provide a basic understanding of the clinical engineering profession, qualifications, roles, activities, and expectations.
- This course will enhance students to practice medical equipment and analyze challenges with their healthcare technology.
- This course will expose students to explore the Health Technology Management systems with medical devices and supportive services with advanced application.

UNIT I INTRODUCTION

Clinical engineering: Definition, Evolution, Role, Responsibilities, Functional status, History of clinical engineering and Technology in Health Care System, Enhancing patient safety

UNIT II MEDICAL TECHNOLOGY MANAGEMENT PRACTICES

Strategic Medical Technology Planning, Scope, Clinical necessity operational support, strategic planning process – Technology assessment: Technology audit, Budget strategies, Prerequisite for medical technology assessment – Management Practice for Medical Equipment - Device evaluation, Risk reduction, Asset management, ESHTA.

UNIT III ESSENTIAL HEALTH CARE TECHNOLOGY PACKAGE (EHTP)

Introduction – Health care technology management – Package development Methodology, Logical framework, Implementation, Information promotion and dissemination – EHTP Justification – EHTP matrix – EHTP advantages – Impact Analysis.

UNIT IV CLINICAL ENGINEERING PROGRAM INDICATOR

Clinical engineering: program services, Program database – Clinical Engineering Program management, Program indicator, Managing clinical engineering performance using program indicators – Indicator management process.

UNIT V ADVANCED TECHNOLOGY FOR PATIENT SAFETY

Factors Contributing to Medical Errors; Health Care Reimbursement, Health Care Failure Mode and Effect Analysis (HFMEA), Patient Safety Best Practices Model: Bar coding, Computerized Physician Order Entry (CPOE), and Clinical data repositories – Process analysis

TEXTBOOKS:

1. Ernesto Iadanza, Joseph Dyro, "Clinical Engineering Handbook", Elsevier Academic Press, 2014
2. Robert Miniati, "Clinical Engineering from Devices to Systems", Academic Press, 23-Dec- 2015 - Technology & Engineering

CLINICAL RESEARCH

Course Code	Course Title	L	T	P	C
22117DSC54I	CLINICAL RESEARCH	4	1	0	3

UNIT 1 Introduction to Clinical Research

Introduction to Clinical Research, Terminologies in Clinical Research, Advantages of CR in India

UNIT 2 Good Clinical Practice (GCP)-ICH E6

History Development of International Regulations in Clinical Research, Good Clinical Practices, Ethics committee, Investigator Responsibilities

UNIT 3 Pharmacovigilance

Medical Management of Adverse Events, Handling Death, Unblinding of Drug, Clinical Safety and Pharmacovigilance, E2A- Clinical Safety and Data Management

UNIT 4 Drug Development Process

Overview of Drug Development, Clinical trial phases, BA/BE Studies

UNIT 5 Clinical Data Management

CFR Part 11, CRF_Design_2, Introduction to CDM, Data Entry Methods, Query Management, Source data validation

Text & References:

- Drug Discovery and Development , 2nd Edition by Raymond G Hill
- Drugs: From Discovery to Approval by Rick Ng

TOOLS IN BIOSTATISTICS

Course Code	Course Title	L	T	P	C
22117DSC63C	TOOLS IN BIOSTATISTICS	4	1	0	3

UNIT 1:

Elementary concepts in Statistics: Concepts of statistical population and sample from a population; qualitative and quantitative data; nominal, ordinal, ratio, interval data; cross-sectional and time-series data

UNIT 2:

Using R Software's: Difference of mean & proportion, Chi-Square test for independence of attributes and Contingency table, t-test, Paired t-test, Test for correlation in sampling from normal population

UNIT 3:

Statistical techniques: Correlation: Pearson product moment correlation, Spearman rank correlation, Partial correlation, Simple linear regression

UNIT 4:

Introduction to Regression: **Multiple Regressions:** Multiple linear regression and correlation - Model building and selection - Interpreting regression coefficients and confidence intervals

UNIT 5:

Decision Trees: Introduction to SPSS Decision Trees - Application of SPSS Decision Trees - Overview of decision tree-based methods (CRT Decision Trees CRT Regression Trees Quant Analysis)

REFERENCES

- ❖ Dutta, N. K. (2004). Fundamentals of Biostatistics, Kanishka Publishers.
- ❖ Gurumani N. (2005). An Introduction to Biostatistics, MJP Publishers.
- ❖ Daniel, W. W. (2007). Biostatistics- A Foundation for Analysis in the Health Sciences, Wiley.
- ❖ Rohatgi, V.K.& Saleh, A.K.Md. (2001). An Introduction to Probability and Statistics, John Wiley & Sons.
- ❖ Rossi R.J. (2010). Applied Biostatistics for Health Sciences, Wiley.

GENETICS AND SOCIETY

Course Code	Course Title	L	T	P	C
22117DSC63E	GENETICS AND SOCIETY	4	1	0	3

Unit- 1: Genetics and Society

Theory of natural selection Application to organic evolution and its social impact. Inherited traits and ethnic groups

Unit- 2:

Human Genome Project and Its Impact

Unit- 3: Testing, Screening and Prevention of Genetic Disease

Carrier detection and presymptomatic diagnosis. Prenatal diagnosis of genetic disease – invasive and noninvasive Preimplantation genetic diagnosis

Unit- 4: Ethical Issues

Ethics Principles – informed consent, informed choice, autonomy confidentiality. Ethical considerations – prenatal diagnosis, population screening, family screening, embryo research, gene therapy.

Unit- 5: Genetic Counseling:

Definition Establishing the diagnosis Calculating and presenting the risk Discussing the options, communication and support outcomes in genetic counseling.

References:

1. Emery's– Element of Medical Genetics – Ian. D. Young, Robert. F. Mueller. GeneticsFairbanks, Ralph.
2. Genetic Counseling – Diane, L. Baker, Jane. L. Schuette, Wendy. R. Uhlmann.

SYSTEM BIOLOGY AND BIOTECHNOLOGY

Course Code	Course Title	L	T	P	C
22117DSC63F	SYSTEM BIOLOGY AND BIOTECHNOLOGY	4	1	0	3

UNIT 1:

Introduction to Mathematical Modelling, Introduction to Static Networks, Network Biology and Applications

UNIT 2:

Reconstruction of Biological Networks, Dynamic Modelling of Biological Systems: Introduction, Solving ODEs & Parameter Estimation

UNIT 3:

Evolutionary Algorithms, Guest Lectures on Modelling in Drug Development, Constraint-based approaches to Modelling Metabolic Networks

UNIT 4:

Perturbations to Metabolic Networks, Elementary Modes, Applications of Constraint-based Modelling, Constraint-based Modelling Recap, 13C Metabolic Flux Analysis

UNIT 5:

Modelling Regulation, Host-pathogen interactions, Robustness of Biological Systems, Robustness and Evolvability, Introduction to Synthetic Biology, Perspectives & Challenges

Books and References:

1. Voit E (2012) *A First Course in Systems Biology*. Garland Science, 1/e. ISBN 0815344678
2. Klipp E (2009) *Systems biology: a textbook*. Wiley-VCH, 1/e. ISBN 9783527318742
3. Newman MEJ (2011) *Networks: an introduction*. Oxford Univ. Press, ISBN 9780199206650

CELL CULTURE TECHNIQUES

Course Code	Course Title	L	T	P	C
22117DSC63G	CELL CULTURE TECHNIQUES	4	1	0	3

UNIT 1:

Introduction & biology of cultured cells, Equipments, aseptic techniques, safety protocols

UNIT 2:

Culture vessels & media development, Serum-free medium development & sterilization

UNIT 3:

Primary culture, secondary culture, cloning & selection

UNIT 4:

Cell separation, characterization, differentiation & transformation, Contamination, cryo-preservation & cyto-toxicity

UNIT 5:

Organo-typic culture & specialized cell culture technique

Books and references

- Culture of Animal Cells by R. Ian Freshney
- Cell culture technology: Recent advances and future prospects (Euroscicon Meeting Reports Book 1) by Bruserud, Øystein and Astrid Englezou
- Vertebrate Cell Culture II and Enzyme Technology: Volume 39 (Advances in Biochemical Engineering/ Biotechnology) by A.F. Blöckmann and G. Carrea
- Animal Cell Culture and Technology (The Basics) (Garland Science)) by Michael Butler
- The Immortal Life of Henrietta Lacks by Rebecca Skloot

FORENSIC IDENTIFICATION

Course Code	Course Title	L	T	P	C
22217DSC15C	FORENSIC IDENTIFICATION	4	1	0	3

Unit 1

Forensic Science Unit Introduction, Need, Scope, Concepts and Significance of Forensic Science, History and Development of Forensic Science, Laws and Basic principles of Forensic Science, Branches of forensic science, Organizational set-up of a Forensic Science Laboratory.

Unit 2

Tools and techniques in Forensic Science Basic principles of microscopy, spectroscopy, chromatography, Electrophoresis, Enzyme Linked Immunosorbent Assay (ELISA), Radio Immuno Assay (RIA). Measuring and optical instruments. Research methodologies.

Unit 3

Fingerprints and Palm prints History and development of Dermatoglyphics, formation of ridges, pattern types, pattern area. Classification of fingerprints- Henry's system of classification, single-digit classification, Extension of Henry's classification, filing, searching and fingerprint bureau. Automated Fingerprint Identification System (AFIS). Modern methodologies in fingerprinting.

Unit 4

Foot/ Footwear/Tyre impressions Importance, Gait pattern, Casting of footprints in different medium, electrostatic lifting of latent footprints, Taking of control samples. Collection, tracing, lifting, casting of impressions, enhancement of footwear impressions, analysis and comparison of foot impressions, moulds, identification characteristics.

Unit 5

Lip prints, Ear prints and their significance Nature, location, collection and evaluation of lip prints, Forensic Significance, photography, location, collection and evaluation, taking of control samples of footprints, lip prints and Ear prints for comparison.

REFERENCES:

1. Bridges, B.C; Criminal Investigation, Practical Fingerprinting, Thumb Impression, Handwriting expert Testimony, Opinion Evidence., Univ. Book Agency, Allahabad, 2000
2. Mehta, M.K; Identification of Thumb impression & cross examination of Fingerprints, N.M. Tripathi Pub. Bombay, 1980.
3. Chatterjee, S.K; Speculation in Fingerprint Identification, Jantralekha printing Works, Kolkata, 1981.
4. Cowger James F; Friction Ridge Skin- Comparison & Identification of Fingerprints, CRC Press, NY, 1993

CO-OPERATIVE EDUCATION

Course Code	Course Title	L	T	P	C
22217DSC15D	CO-OPERATIVE EDUCATION	4	1	0	3

Course Objectives:

- Students will increase their discipline-related knowledge
- Students will develop interpersonal and professional skills that allow for successful workforce transition
- Students will develop improved analysis, problem solving and decision-making skills
- Students will learn organizational structure, behavior and function

Unit 1: Evolution of Co-operation

Concept – Features – Benefits of Cooperation. Co-operative Principles: Meaning – Evolution of Cooperative Principles – Rochdale Principles – Reformulation of Cooperative Principles by ICA operative Identity Statement 1995: Definition, Values and Principles. – Need and Importance – Arrangements for Co-operative Education and Training in India at Different Levels – ICA- Sectoral Organization.

Unit 2: Co-operative Movement in India

Genesis of Co-operative Movement in India – Development during Pre-Independence and Post Independence Era; Strategies for Co-operative Development; Co- operative Extension, Co operative Education and Training.

Unit 3:

Various forms of Business Organizations such as Sole Trader partnership firm, joint stock Companies and co-operative societies, - Difference between private firms and co operative Societies

Unit 4: Non-Agricultural Credit Co-operatives

Constitution and Functions of Co-operative Urban Banks, Employees Co-operative Credit Societies, Co-operative Housing Societies and Industrial Co-operative Banks- NABARD and RBI.

Unit 5: Provision Relating to Employees of Cooperatives

Common Cadre-Recruitment Bureau-Selection, Placement– Offences and Penalties to Employees –Provision Relating to Appeal, Revision-Review- Cooperative Tribunals.

REFERENCES

1. Dr. B.S.Mathur, Co-operation in India – Sahitya Bhawan, 1999 and 2010.
2. A. John Winfred and V.Kulandaishwamy, Co-operative Thought, Rainbow Publications, 1987.
3. Government of Tamil Nadu, Tamil Nadu Cooperative Society's Act of 1983 and 1988.

COMPUTER SECURITY AND COMPUTER FORENSIC

Course Code	Course Title	L	T	P	C
22217DSC15E	COMPUTER SECURITY AND COMPUTER FORENSIC	4	1	0	3

Course Objective:

- Understand the threats in networks and security concepts.
- Understand security services for email.
- Awareness of firewall and its applications.
- To correctly define and cite appropriate instances for the application of computer forensics. Correctly
- Collect and analyze computer forensic evidence Identify the essential and up-to-date concepts, algorithms, protocols, tools, and methodology of Computer Forensics

Course Content:

Module-I:

Ethical hacking, Attack Vectors, Clarification of Terms, Traditional Problems associated with Computer Crimes, Realms of Cyber world, unauthorized access, computer intrusions, white-collar crimes, viruses and malicious code, virus attacks, pornography, software piracy, mail bombs, exploitation, stalking and obscenity in internet, Cyber psychology.

Module-II: Introduction to Digital forensics, Forensic software and handling, forensic hardware and handling, analysis and advanced tools, forensic technology and practices, Biometrics: face, iris and fingerprint recognition, Audio-video evidence collection, Preservation and Forensic Analysis.

Module-III:

Definition and types of cybercrimes, electronic evidence and handling, electronic, introduction to internet crimes, hacking and cracking, credit card and ATM frauds, web technology, cryptography, emerging digital crimes and modules.

Module-IV:

Basics of Computer Computer organisation, components of computer- input and output devices, CPU, Memory hierarchy, types of memory, storage devices, system softwares, application softwares, basics of computer languages.

Module-V:

Computer Forensics Definition and Cardinal Rules, Data Acquisition and Authentication Process, Windows Systems-FAT12, FAT16, FAT32 and NTFS, UNIX file Systems, mac file systems, computer artifacts, Internet Artifacts, OS Artifacts and their forensic applications

Text & References:

1. C. Altheide & H. Carvey Digital Forensics with Open Source Tools, Syngress, 2011. ISBN: 9781597495868.
2. Online Course management System: <https://esu.desire2learn.com/>

PATHOLOGY AND EXPERIMENTAL MEDICINE

Course Code	Course Title	L	T	P	C
22217DSC15F	PATHOLOGY AND EXPERIMENTAL MEDICINE	4	1	0	3

COURSE OBJECTIVES:

- To possess an in-depth understanding of the fundamentals and principles of various laboratory procedures done in Pathology including blood bank
- To be able to perform routine and special laboratory investigations in haematology and cytology and histopathology laboratory
- To possess a full working knowledge about the functioning and performance all the automated instruments of Haematology, Histopathology, Cytology and Blood Banking
- To be able to function as effective educators and conduct independent research work in the field of Medical Laboratory Technology

UNIT 1

General aspects of blood cell formation, Sites of haematopoiesis, Development of blood cells, Morphology and Regulation of haematopoiesis, Red blood cells - Basic aspects of anemia, definition, pathophysiology, classification and clinical features

UNIT 2

Basic Structure of mammalian cell, Cell Physiology, Cell cycle and cell division, Chromosome structure, human chromosome complement and methods of demonstration of sex chromatin, Benign Pathological processes affecting the cell

UNIT 3

Staining techniques in cytology along with relevant special stains, Use of cytospin centrifuge, Methods of cell block preparation, Biomedical waste management in cytology

UNIT 4

Role of cytologic techniques in diagnosis of cancer, Pathology and Cytology of Respiratory tract, urinary tract with a knowledge of distinguishing between normal and abnormal smears, Identifying malignancies, Setting up of the FNAC laboratory service, Organization and quality assurance in Cytology- Internal Quality control and external quality assessment programmes

UNIT 5

Evaluation of diagnostic procedure – Sensitivity, Specificity, Predictive values, Likelihood ratio and ROC curve, Testing of hypothesis – concept of hypothesis and statistical significance, Parametric and non-parametric tests.

REFERENCES:

1. Bain BJ, Bates I, Laffan MA, Lewis SM. Dacie and Lewis Practical Hematology. Philadelphia: Elsevier Churchill Livingstone.
2. McPherson RA, Pincus MR. Henry's Clinical Diagnosis and Management by Laboratory Methods, Philadelphia: Elsevier Saunders.
3. Koss LG, Melamed MR. Koss's Diagnostic Cytology, and its Histopathologic Bases. Philadelphia: Lippincott Williams and Wilkins.
4. Hoda RS, Hoda SA. Fundamentals of Pap Test Cytology. Humana.
5. Mahajan BK. Methods in Biostatistics, Jaypee.

CHEMICAL BIOTECHNOLOGY

Course Code	Course Title	L	T	P	C
22217DSC25C	CHEMICAL BIOTECHNOLOGY	4	1	0	3

UNIT 1: Introduction and fundamentals of chemical engineering

Chemical Engineering in day to life with examples, origin and growth of chemical engineering, chemical engineering job titles/options, unit operations and unit processes concepts, molarity, molality, normality, ppm, density and specific gravity, composition relationships, ideal gases and gas mixtures, real gases, vapour pressure, vapour liquid equilibrium, humidity and saturation.

UNIT 2: Introduction to Biotechnology

Biotechnology: History, scope, significance and Ethics, Types of Biotechnology: Microbial, agricultural, animal, plant, aquatic, food, medical; Industrial Organisms: Prokaryotes, Eukaryotes; Metabolic processes: Anabolism and Catabolism

UNIT 3: Bioproducts and Biosystems Engineering

Biomass: Baker's Yeast, Algae; Bioproducts: Aminoacids, Organic acids, Antibiotics, Microbial Polysaccharides and Lipids, Bioplastics, Biofertilizers, Enzymes, Biosensors, Vaccines, Monoclonal antibodies; Biofuels: Bioethanol, biogas; Bioremediation for petroleum spill, wastewater treatment.

UNIT 4: Biochemical Conversion and Refinery concepts

Biochemical (anaerobic digestion and fermentation) conversion of waste. Biogas characterization, yields, and optimization. Scopes of energy efficiency improvement in power sectors. Energy integration, Gas cleaning. Possible integrated refinery options, techno-economic evaluation, life-cycle assessment.

UNIT 5: Life Cycle Assessment and Clean Technology options

Environmental audits-waste audits, life cycle assessment industrial symbiosis, Clean technology options, clean technology and clean up technology and clean synthesis. Materials re-use, waste reduction at source, economics of pollution.

REFERENCES:

1. W.J. Thieman, M. A. Palladino, Introduction to Biotechnology, 4th Edn., Pearson Education Ltd., 2021.
2. S.C. Bhatia, Textbook of Biotechnology, Atlantic Publishers, 2005.
3. R. Mareddy, Environmental Impact Assessment: Theory and Practice, Butterworth-Heinemann 2017.
4. J. Glasson, R. Therivel, Introduction to Environmental Impact Assessment, Taylor & Francis, Routledge 2019.

CHEMICAL BIOTECHNOLOGY

Course Code	Course Title	L	T	P	C
22217DSC25D	FOOD INDUSTRY ROLES AND RESPONSIBILITIES	4	1	0	3

Module 1 Introduction to Food Industry Roles and Responsibilities

Module 2 Food Safety and Quality Control

Module 3 Food Production and Manufacturing Processes

Module 4 Regulatory Compliance in the Food Industry

Module 5 Food Industry Marketing and Sales

Module 6 Career Opportunities in the Food Industry

ARTIFICIAL INTELLIGENCE

Course Code	Course Title	L	T	P	C
22217DSC25E	ARTIFICIAL INTELLIGENCE	4	1	0	3

Course Objective:

To develop semantic-based and context-aware systems to acquire, organize process, share and use the knowledge embedded in multimedia content. Research will aim to maximize automation of the complete knowledge lifecycle and achieve semantic interoperability between Web resources and services. The field of Robotics is a multi disciplinary as robots are amazingly complex system comprising mechanical, electrical, electronic H/W and S/W and issues germane to all these.

MODULE-I

AI problems, foundation of AI and history of AI intelligent agents: Agents and Environments, the concept of rationality, the nature of environments, structure of agents, problem solving agents, problem formulation.

MODULE-II

Searching- Searching for solutions, uniformed search strategies – Breadth first search, depth first Search. Search with partial information (Heuristic search) Hill climbing, A* ,AO* Algorithms

MODULE-III

Knowledge representation issues, predicate logic- logic programming, semantic nets- frames and inheritance, constraint propagation, representing knowledge using rules, rules based deduction systems.

MODULE-IV

First order logic, Inference in first order logic, propositional vs. first order inference, unification & lifts forward chaining, Backward chaining, Resolution

MODULE-V

Expert systems:- Introduction, basic concepts, structure of expert systems, the human element in expert systems how expert systems works, problem areas addressed by expert systems, expert systems success factors, types-of expert systems, expert systems and the internet interacts web

Reference Books:-

1. S. Russel and P. Norvig, "Artificial Intelligence – A Modern Approach", SecondEdition, Pearson Education
2. David Poole, Alan Mackworth, Randy Goebel, "Computational Intelligence : a logical approach", Oxford University Press.
3. G. Luger, "Artificial Intelligence: Structures and Strategies for complex problemsolving", Fourth Edition, Pearson Education.
4. J. Nilsson, "Artificial Intelligence: A new Synthesis", Elsevier Publishers.

MATHEMATICS FOR LIFE SCIENCES

Course Code	Course Title	L	T	P	C
22217DSC25F	MATHEMATICS FOR LIFE SCIENCES	4	1	0	3

UNIT 1

Introduction: Mathematics as a language, Need of learning mathematics, Applications of mathematics in Biology

UNIT 2

Graphs and functions – I: Linear function, Quadratic function, Exponential function

UNIT 3

Graphs and functions – II: Periodic functions, Combination of simple functions, Examples from Biology

UNIT 4

Differentiation and its application in Biology – I: Product rule in differentiation, Derivatives of Sine and Cosine functions, Plotting derivatives, Differential calculus to understand actin polymerization

UNIT 5

Differentiation and its application in Biology – IV: Force and energy, DNA unzipping, Plotting mathematical function

References:

- Mathematics for Biological Scientists, M. Aitken, B. Broadhursts, S. Haldky, Garland Science (2009)
- Introduction to Mathematics for Life Scientists, E. Batschelet, Springer Verlag, 3rd edition (2003)
- Calculus for Life Sciences, R. De Sapiro, W. H. Freeman and Co. (1976)
- Physical Biology of the Cell, R Phillips, J Kondev, J Theriot, Garland Science (2009)
- Random Walks in Biology, H. C. Berg, Princeton university press (1993)

ECOLOGY

Course Code	Course Title	L	T	P	C
22217DSC34C	ECOLOGY	4	1	0	3

COURSE OBJECTIVE:

To introduce the basics of Ecology and Environmental Sciences to students coming from different background.

UNIT-I Introduction to Ecology & environmental sciences; Principles and Scope of Ecology Structure and Functions of Ecosystems- Abiotic and Biotic components, Flow of energy and cycling of materials; water, carbon, nitrogen and phosphorus, Trophic pyramids and food webs; Ecosystems Types and Diversity, Alterations of ecosystem function: acid rain, nuclear winter, global warming and ozone hole, an overview of IPCC.

UNIT-II Aquatic and terrestrial communities; rare communities; deep earth, deep sea floor, volcanoes. Primary productivity; basic concepts, Ecological succession inland, water; concepts, Invasive species and control

UNIT-III Biodiversity: Definition, importance, Magnitude and global accumulation of biodiversity; diversification through geological time scale; Levels of biodiversity. Species diversity

UNIT-IV Population estimation methods- Life tables, fecundity and survivorship schedules pre and post breeding census, field exercise in plant demography, density estimations: field and computer simulation.

Unit-V Biogeography - Distribution of communities and island biogeography; examples.

Text books:

1. Smith, TM and Smith RL 2015. Elements of Ecology, Pearson Education, India.
2. Cain, ML, Bowman, WD and Hacker SD 2011. Ecology, 2nd Edition, Sinauer Associates Inc.
3. Odum, E. P. (2004). Fundamentals of Ecology, Oxford and IBH Publishing Co. Pvt. Ltd.

Reference books:

1. Singh, J.S., S.P & Gupta, S.R. 2006. Ecology, Environment and Resource conservation. Anamaya Publ, New Delhi, 688 pp.
2. Miller, G.T. 2004. Environmental Science. Thomson, California. 538 pgs.
3. Jase Fitzgerald 2017. Biodiversity: An Introduction. Larsen and Keller Education, ISBN: 978-16354904284.

BIOCHEMICAL PATHWAY

Course Code	Course Title	L	T	P	C
22217DSC34D	BIOCHEMICAL PATHWAY	4	1	0	3

UNIT 1

Pathways of carbohydrate biosynthesis - gluconeogenesis, pentose phosphate pathway, glyoxylate pathway.

UNIT 2

Biosynthesis of amino acids, amino acids as biosynthetic precursors.

UNIT 3

Fatty acids and lipid biosynthesis, regulation and their metabolic disorders.

UNIT 4

Biosynthesis of purine and pyrimidine ribonucleotides, formation of deoxyribonucleotides and their regulation.

UNIT 5

Metabolic pathway engineering, vitamin A engineering in cereals, microarray analysis, role of bioinformatics in functional genomics.

REFERENCES:

- Lehninger: Principles of Biochemistry (2013) 6th ed., Nelson, D.L. and Cox, M.M., W.H. Freeman and Company (New York), ISBN: 13: 978-1-4641-0962-1 / ISBN: 10:1-4292-3414-8.
- Textbook of Biochemistry with Clinical Correlations (2011) 7th ed., Devlin, T.M., John Wiley & Sons, Inc. (New York), ISBN: 978-0-470-28173-4.
- Biochemistry (2012) 7th ed., Berg, J.M., Tymoczko, J.L. and Stryer L., W.H. Freeman and Company (New York), ISBN:10:1-4292-2936-5, ISBN:13:978-1-4292-2936-4
- Fundamental of Biochemistry, Voet and Voet- provide necessary details on latest edition Edited by Prof. Hiren K Das (JNU).

ANIMAL HEALTH

Course Code	Course Title	L	T	P	C
22217DSC34E	ANIMAL HEALTH	4	1	0	3

COURSE OBJECTIVES:

To provide the candidate with knowledge, understanding and application of animal health, welfare, food hygiene and feed hygiene legislation.

UNIT 1

Introduction: Signs of health & diseases, General causes of diseases, Disease transmission, diagnosis & treatment, Biosecurity: disease prevention

UNIT 2

Immune response (Immune system: Immune organs & cells), Immune response (mechanisms of innate & acquired Immunity), Immune response (Vaccines & Immunity)

UNIT 3

Diseases of digestive system (mouth, choke, lactic acidosis, colic), Diseases of digestive sys. (Bloat, ruminal drinkers, hardware dis.), Diseases of digestive sys. (scours, colibacillosis, obstruction), Diseases of respiratory system

UNIT 4

Nutritional & metabolic diseases, Neonatal diseases & fluid therapy, Urinary tract disorders (general signs, infections, calculi), Reproductive disorders (abortion, dystocia, mastitis)

UNIT 5

Infectious diseases (FMD, erysipelas, PRRS), Infectious diseases (TB, Johne's disease, strangles), Infectious diseases (tetanus, botulism, lyme disease)

REFERENCES

- Introduction to Veterinary Science, Lawhead & Baker, 2004.
- Animal Health, 3rd ed, Jackson, Greer, Baker, 2000.
- Principles of Veterinary Medicine, by Hoopes and Thwaites.
- The Merck Veterinary Manual 9th edition, 2005.

TRANSLATIONAL BIOLOGY AND MOLECULAR MEDICINE

Course Code	Course Title	L	T	P	C
22217DSC34F	TRANSLATIONAL BIOLOGY AND MOLECULAR MEDICINE	4	1	0	3

UNIT 1

Medical Team Selection, Introduction to Molecular Medicine, Scientific Collaboration in Molecular, Medicine- the key players Goal: Personalized Medicine

UNIT 2

Breast Cancer- from Genes to Personalized Medicine

UNIT 3

The CRISPR Revolution- Genes, inheritance, and Genome Editing

UNIT 4

Aging-Related Chronic Diseases from Bench to Bedside

UNIT 5

Immunotherapeutics for Autoimmunity and Cancer, Molecular Medicine and Forensic Science

MOLECULAR MEDICINE AND FORENSIC SCIENCE

Course Code	Course Title	L	T	P	C
22217DSC44C	MOLECULAR MEDICINE AND FORENSIC SCIENCE	4	1	0	3

UNIT 1

Molecular docking with deep learning, convolution neural network and its potential in virtual screening and binding affinity prediction, machine learning algorithms as scoring functions and rank binding poses. Application of deep learning to predicting protein structure

UNIT 2

Machine learning techniques in drug discovery and development, Machine learning applications in cancer prognosis and prediction, Emphasis on papers illustrating techniques for data-driven machine learning analysis of big data in Digital medicine.

UNIT 3: BASICS OF FORENSIC SCIENCE

Introduction Global History and Scope, Need and Development Principles, emphasizing on Specific contribution of Scientists in the field of Forensic Science

UNIT 4 FORENSIC PSYCHOLOGY

Forensic Psychology – Introduction, Scope and Significance, Role of forensic Psychologist, Psychology and law- Laws related to psychology, fitness to stand trial, legal perspective of insanity, Psychology of evidence – eyewitness testimony, confession evidence. Criminal profiling, Ethical issues in Psychology.

UNIT 5: BIOMETRICS

Biometric evidences such as finger impressions, retina, iris patterns, voice, face recognition. 3D face recognition, automatic forensic dental identification, hand vascular pattern. Multibiometric system, Recent techniques and developments, biometric databases.

REFERENCES:

1. Introduction to Machine Learning, By Ethem Alpayd in, 4th Edition, MIT press, 2020
2. Artificial Intelligence in Drug Discovery, Editor: Nathan Brown, Copyright year m2021; Print ISBN 978-1-78801-547-9
3. Deep Learning for the Life Sciences, by Bharath Ramsundar, Peter Eastman
4. Patrick Walters, Vijay Pande, Released April 2019, Publisher(s): O'Reilly Media, Inc., ISBN: 9781492039839
5. Morgan C. T. King R. A. Weisz J. R. & Schopler J., Introduction to psychology (7th ed.), McGraw-Hill.
6. Veeraraghavan, V. Handbook of Forensic Psychology 2nd ed. Selective &
7. Scientific Books: India
8. C. Champod, C. Lennard, P. Margot an M. Stoilovic, Fingerprints and other Ridge Skin Impressions, CRC Press, Boca Raton (2004).

LIVE STOCK PRODUCTION & MANAGEMENT

Course Code	Course Title	L	T	P	C
22217DSC44D	LIVE STOCK PRODUCTION & MANAGEMENT	4	1	0	3

UNIT 1

Introduction-Development of Daily Industry in India and World-Present status and future prospects of livestock development in India.

UNIT 2

Integrated fish farming: principles, Poultry-cum-fish culture, Duck-cum-fish culture, Pig-cum-fish culture, Paddy-cum-fish culture, Mushroom-cum-fish culture, Vermicomposting-cum-fish culture, Fish-cum-horticulture, Sewage-fed fish culture: Fish-cum-sericulture, Aquatic Plant-cum-fish culture, livestock management in relation to fish culture.

UNIT 3

Introduction and scope of swine farming in the country. Demography of swine population. Breeds and their role in economy. Management of different categories of swine for optimal production: breeding and pregnant sows; sows at farrowing and after farrowing: pig-MS, growing stock, lactating sows, feed lot stock.

UNIT 4

Biodiversity management: Concept of biological diversity. Conservation in India and abroad. Wildlife conservation programmes. The wildlife (protection) Act-1972, Biological diversity Act- 2002, Basic concept of Zoo Management

UNIT 5

Demography of cattle and buffalo population. Breeds and breed descriptors of important breeds. Important traits of cattle and buffaloes. General management and feeding practices of calves, heifers, pregnant, lactating and dry animals in bulls and working animals. Draught ability of cattle and buffaloes. Raising of buffalo mates for meat production.

REFERENCES:

1. Akano IE. 1992. DNA Technology. IAP Academic Press.
2. Micklos DA, Fryer GA & Crotty DA. 2003. DNA Science. Cold Spring Harbour.
3. Setlow JK. 2006. Genetic Engineering – Principles and Methods. Springer.
4. Lasley JF. 1987. Genetics of Livestock Improvement. 3rd Ed. IBH.
5. Nicholas FW. 1987. Veterinary Genetics. Clarendon Press.

VETERINARY MEDICINE

Course Code	Course Title	L	T	P	C
22217DSC44E	VETERINARY MEDICINE	4	1	0	3

UNIT 1:

Elementary Anatomy and Physiology of Animals, Introduction to anatomy and physiology of musculoskeletal, digestive, cardiovascular, respiratory, nervous excretory, male and female reproductive and endocrine systems and mammary glands of domestic animals; Body cavities

UNIT 2 Elementary Pharmacology

Introduction of Pharmacology, Nature and sources of drugs; Routes of drug administration; Dosage forms; Pharmaceutical processes; Handling of Hazardous substances; Chemical sterilization of equipments and premises; Antiseptics and disinfectants; Weights and measures; Pharmacy calculations; Classification of important drugs; Important Indigenous drugs.

UNIT 3 Elementary Parasitology

Economic importance of parasitic diseases of livestock, Introduction to endo-and ecto- parasites; Prevention control and treatment of diseases caused by protozoa, trematodes, cestodes, nematodes and arthropods in livestock; Parasites of zoonotic importance.

UNIT 4 Basic Preventive Veterinary Medicine

Definition, incidence, etiology, epidemiology, pathogenesis, transmission, clinical findings, diagnosis, prevention and control of Hemorrhagic Septicaemia, Brucellosis, Tuberculosis, Listeriosis, Actinobacillosis, Foot and Mouth disease, Rabies, Johne's disease, Strangles, Glanders, Classical swine fever, Abortions, Enterotoxaemia etc. Toxicities e.g. nitrate, BHC, DDT.

UNIT 5 Wounds Management and Veterinary Care

Wound: causes, classification, drainage; Wound dressings and wound protection; Cyst; Haematoma; Hernia Abscess; Clinical use of antiseptics, fly repellents, anti-maggot etc.; First aid in sick animals including fracture cases.



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DEPARTMENT OF BIOTECHNOLOGY

Certificate course on
MEDICAL LABORATORY TECHNICIAN
SYLLABUS

SUBJECT CODE: 22517MT

Total: 45 hours

Course objectives:

- To provide students with comprehensive knowledge of various laboratory techniques, including microbiology, biochemistry, clinical pathology, serology, and hematology.
- Students learn how to conduct diagnostic tests, interpret test results, and maintain laboratory equipment and supplies.

Course Outcomes:

- Perform routine clinical laboratory procedures within acceptable quality control parameters in Hematology, Chemistry, Immunohematology, and Microbiology under the general supervision of a Clinical Laboratory Scientist or Pathologist.
- Demonstrate technical skills, social behavior, and professional awareness incumbent upon a laboratory technician.
- Operate and maintain laboratory equipment, utilizing appropriate quality control and safety procedures.

UNIT 1 (9 hours)

Anatomical terms & Anatomical Positions, Different parts of the human body, Tissue with Function & Classification, Genito- Urinary System - Male & Female Reproductive Organic System, Urinary bladder, Kidney and Ureter, Uterus & Urethra

UNIT 2 (9 hours)

Morphology and Staining of Bacteria, Bacteriological Examination of Pus, Abscess and wounds, Isolation and Inoculation according Techniques, Biochemical Test

UNIT 3 (9 hours)

Introduction of Haematology, Collection of Blood, Estimation of Haemoglobin, Anticoagulation, MCV, MCH & MCHC & its Importance, Total Platelet Count, Urine Analysis, Semen Analysis

UNIT 4 (9 hours)

ABO & Rh Blood Group System, Blood Transfusion and its Reactions, Administration of Blood Bank

UNIT 5 (9 hours)

Microscope-Principal, Operation, care and use, Sterilization: General Principal and Classification, First Aid and Safety Measures, Collection preservation and Storage of different body fluids

REFERENCE

1. Godkar P.B, Textbook of MLT, 3rd edition, Bhalani Publications.
2. Mukherjee L. K, Medical Laboratory Technology, Vol.1-3, 3rd edition, Tata McGraw Hill
3. Wintrobe's Clinical Haematology, 14th edition, Lippincott Williams & Wilkins
4. De Gruchy's Clinical Haematology in Medical Practice, Sixth edition, Wiley Publications
5. Dacei J.A & Lewis S.M. Practical Haematology, The English Language Book Society, 8th ed., ELBS
6. Mark K. Fung, Brenda J. Grossman, Christopher D. Hillyer, Connie M Westhoff, Technical Manual, 18th ed., AABB

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DEPARTMENT OF BIOTECHNOLOGY

Certificate course on
SPIRULINA CULTIVATION
SYLLABUS

SUBJECT CODE: 22517SC

Total: 45 hrs

Course objectives:

- To introduce fundamental concepts and methods of spirulina cultivation
- To train the students in comprehensive spirulina production and post-production
- To make the students become an entrepreneur

Course Outcomes:

- Will prepare students to understand the spirulina cultivation techniques
- It will also help students to learn the application of spirulina
- Will prepare students to understand the problems of farmers and them to tackle them with recent Biotechnological advances.

UNIT 1

(9 hours)

Introduction to SCP production – historical use and rediscovery of Spirulina, importance, morphology, taxonomy and habitat of Spirulina

UNIT 2

(9 hours)

Biochemical composition - amino acids, unsaturated fatty acids and lipids, minerals, vitamins, pigments, carotenoids and phycobiliproteins. Chelating of toxic minerals.

UNIT 3

(9 hours)

Cultivation and production of spirulina - Natural production – Nutritional media, small scale commercial production – commercial and mass cultivation (tank construction, culture medium, strain selection, scaling up of the process)

UNIT 4

(9 hours)

Importance of light and pH in Spirulina cultivation – Harvesting and processing drying and packing

UNIT 5

(9 hours)

Products, uses and benefits -Spirulina and its use by humans-Immune system enhancement, nutritional supplements, Food source, Food safety aspects related to human consumption of spirulina, Spirulina and agriculture - nutritional supplement, a colourant

REFERENCES:

1. Avigad Vonshak, Spirulina platensis (Arthrospira) Physiology, cell-biology and biotechnology, Taylor & Francis Ltd. 2. Selvendran D. 2015.
2. Large Scale Algal Biomass (Spirulina) Production in India. In: D. Das (Ed.) Algal Biorefinery: An Integrated Approach, Springer.
3. Habib M.A.B., Parvin M., Huntington T.C. and Hasan M.R. 2008. A review on culture, production and use of Spirulina as food for humans and feeds for domestic animals and fish. FAO Fishers and Aquaculture Circular No. 1034, FAO, Rome, Italy

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DEPARTMENT OF BIOTECHNOLOGY

Diploma course on
FERMENTATION TECHNOLOGY
SYLLABUS

SUBJECT CODE: 22517FT

Total: 90 hours

Course objectives:

- To study the design and construction of fermentor and parameters to be monitored and controlled in fermentation process
- To study the principle of sterilization necessary for fermentation
- To study the cell growth and product formation
- To evaluate the kinetics and mechanism of microbial growth

Course outcomes:

- This subject puts emphasis on the basic engineering principles of Fermentation Technology.
- It also highlights the application of fermentation in biotechnological industry.

UNIT I: Introduction to fermentation

(18 hours)

Introduction to fermentation; History and development of fermentation industry; General requirements of fermentation processes; Isolation, preservation and improvement of industrially important micro-organisms.

UNIT II: Preparation of microorganisms (microbial cells) for fermentation.

(18 hours)

Development of inoculate for industrial fermentations; Kinetics of microbial growth and death; Air and media sterilization

UNIT III: Basic design of fermentor

(18 hours)

Fermentor; Basic design and construction of fermentor and ancillaries; Different types of fermentations

UNIT IV: Types of fermentation process

(18 hours)

An overview of aerobic and anaerobic fermentation processes and their application in the biotechnology industry solid-substrate fermentation and its applications.

UNIT V: Measurement of Parameters

(18 hours)

Measurement and control of bioprocess parameters Analysis of batch, fed-batch and continuous bioreactions; Bioreactor configuration - batch, continuous stirred-tank, tubular, plug flow, packed bed, air lift, fluidized bed

REFERENCES:

1. Murray Moo -Young, Comprehensive Biotechnology, Vol. I & III-latest ed.
2. Microbes & Fermentation, A. Lel and Kotlers Richard J. Mickey, Oriffin Publication
3. Industrial Fermentations- Leland, N. Y. Chemical Publishers.
4. Prescott and Dunn's- Industrial Microbiology, 4 th, ed.

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DEPARTMENT OF BIOTECHNOLOGY

Certificate course on
AQUACULTURE TECHNOLOGY
SYLLABUS

SUBJECT CODE: 22517AT

Total: 45 hours

Course objectives:

- To meet the academic to provide knowledge for sustainable aquaculture
- To expose learners to frontier and thrust areas of Aquaculture
- To provide the learners an experience in research for Aquaculture production

Course outcomes:

- Identify and understand different types of fishes and fin fish anatomy
- Understand the Aquatic environment and Aquatic ecosystem
- Understand the Classification of Fishes and Distribution
- Understand the Food and Feeding Habits.

UNIT 1

(9 hours)

Definition of ecology, organism and environment; features of organism - environment relations; living and non - living environments; the ecosystem or habitat

UNIT 2

(9 hours)

Basic structure of the skin in fishes; epidermal derivatives - microridges and integumentary glands; dermal derivatives - cosmoid scales, ganoid scales, placoid scales, elasmoid, cycloid and ctenoid scales; fish age and scales; integumentary pigments; mouth and jaws; gill slits; fins - median fins and paired fins, origin of paired fins; coloration

UNIT 3

(9 hours)

Types of food - basic food, secondary food, incidental food, obligatory food; feeding habits - detritivores, scavengers, herbivores, omnivores, carnivores, surface feeders, column feeders, bottom feeders; monophagic, stenophagic and euryphagic fishes; seasonal changes in food availability and food preferences

UNIT 4

(9 hours)

Reproduction - ovary and testes, structure, development of primary and secondary sexual & Sexual dimorphism in fishes. Endocrine organs in fishes - Pituitary gland, thyroid gland, adrenal gland, Urohypophysis, pancreatic islets and pineal organs.

UNIT 5

(9 hours)

Microbial infections of Bacteria, Viruses, fungi and algae- pathogenicity and virulence-source of infection- morphological, physiological and sociological diagnosis-microbiological water quality management- application of drugs, chemicals and antibiotics.

REFERENCES:

1. Jhingran, V.G. 1991. Fish and Fisheries of India. Hindustan Publ. Corporation (India).
2. Lagler, K. F., J. E. Bardach and R. R. Miller. 1977. Ichthyology. John Wiley.
3. Moyl, P. B. 1995. Fishes: An Introduction to Ichthyology. 3/Ed. Narendra Publishing House, New Delhi.
4. Talwar, P. K. and V. G. Jhingran. 1991. Inland Fishes of India and Adjacent Countries. Vol. I & II. Oxford and IBM Publishing Co.,
5. Halver, J. E. 1972. Fish Nutrition. Academic Press, New York. 2. Senz, S. De Silva and Trevor A. Anderson. Fish Nutrition in Aquaculture. Chapman & Hall London. 1998, p. 319. New Delhi.

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DEPARTMENT OF BIOTECHNOLOGY

Certificate course on
3D BIOPRINTING
SYLLABUS

SUBJECT CODE: 225173BP

Total: 45 hours

Course objectives:

This course is of interest for students with a bio/medical, material chemistry or engineering background interested in the application of 3D printing and other 3D fabrication techniques in the field of medicine.

- It will provide insight in the opportunities of additive manufacturing technologies, micro/nano devices and 3D printing in biomedical applications.
- It will provide the basics of 3D printing and additive manufacturing and devices used for biofabrication, and the introduction to 3D design.
- It will also provide insight in the specific challenges encountered when translating 3D printing to biofabrication, such as the development of specific bioinks and the required control over processing conditions

Course outcomes:

On completion of the course the student will be able to:

1. Use software tools for 3D printing
2. Prepare 3D printed modules
3. Construct products using LOM and FDM technologies

UNIT 1

(9 hours)

Opportunities & Challenges of 3D bioprinting & biofabrication in medical applications, Core Principles and Physical Foundations underlying 3D Bioprinting, Basic process of 3D bioprinting (problem, design, material selection, and object fabrication)

UNIT 2

(9 hours)

Biofabrication and 3D-Bioprinting Technologies and Tools, Medical imaging and imaging processing, Biomodeling, Blueprints (Digital models of tissues and organs), Technology platform and emerging trends in bioprinting, Validating assays applied to printed products

UNIT 3

(9 hours)

Introduction to Bioinks, Important material requirement for Bioink development, Crosslinking of Hydrogels for Bioprinting, Single-Material and Multimaterial Bioink Systems

UNIT 4

(9 hours)

Design approaches in Bioprinting, Design of Cornea Tissue-Specific Bioink and 3D Bioprinting of Cornea, Bioprinting of Heart, Bioprinting of Kidney

UNIT 5

(9 hours)

Medical Modeling for Organ Printing, Ethical Issues related to Organ Printing

REFERENCES

1. Chua C.K., Leong K.F. and LIM C.S. Rapid prototyping: Principles and Applications, World Scientific publications, 3rd Ed., 2010.
2. D.T. Pham and S.S. Dimov, "Rapid Manufacturing", Springer, 2001.
3. Terry Wohlers, "Wohlers Report 2000", Wohlers Associates, 2000.
4. Paul F. Jacobs, "Rapid Prototyping and Manufacturing", ASME Press, 1996 5. Ian Gibson, Davin Rosen, Brent Stucker "Additive Manufacturing Technologies, Springer, 2nd Ed, 2014.

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DEPARTMENT OF BIOTECHNOLOGY

CERTIFICATE COURSE SYLLABUS

ACADEMIC YEAR 2022-2023

RENEWABLE ENERGY

Subject code: 22517REY

Course Outcome

1. To Understand the Need, importance and scope of non-conventional and alternate energy resources.
2. To understand role significance of solar energy, Wind Energy.
3. To get the utilization of Biogas plants and geothermal energy
4. To understand the concept of energy Conservation and applications.

Unit I: ENERGY SYSTEM

Solar Radiation Flat Plate and Concentrating Collectors, Solar Direct Thermal Applications, Solar Thermal Power Generation, Fundamentals of Solar Photo Voltaic Conversion, Solar Cells, Solar PV Power Generation, Solar PV Applications, Wind Energy Estimation, Types of Wind Energy Systems, Performance, Site Selection, Details of Wind Turbine Generator. Ocean Thermal Energy Conversion (OTEC), Principle of operation, development of OTEC plants, Tidal and wave energy. Potential and conversion techniques, mini-hydel power plants. Geothermal Energy: Resources, types of wells, methods of harnessing the energy, scope in India.

Unit II: Fuel Technology

Principles of combustion, Solid, Liquid and Gaseous fuels, Coal as source of energy and chemicals, Coal preparation, Carbonization, Gasification and Liquefaction of coal and lignite, Petroleum and its derived products, Inter conversion of fuels, Natural gases and derivatives, Sources and Potential, combustion equipment for solid, Liquid and gaseous fuels, Nuclear fuel and technology.

Unit III: Thermo-chemical conversions: Direct Combustion, Technology of Biomass gasification, Pyrolysis and Liquefaction, Bio- Chemical Conversion: anaerobic digestion, alcohol production from biomass, Chemical conversion process: hydrolysis and hydrogenation,

Unit IV: Biomass Gasifiers: History, Principle, Design of Biomass Gasifiers, updraft gasifier, down draft gasifier, zero carbon biomass gasification plants, Gasification of plastic-rich waste, applications for cooking, electricity generation, Gasifier Engines, Operation of spark ignition and compression ignition engine with wood gas, methanol, ethanol and biogas, Biomass integrated gasification/combined cycles systems.

Unit V: Bio-Energy Systems with Efficient Applications: Traditional Stoves, Energy Efficient Cooking and Space heating Stoves, Metal Stoves Improved Gasifier Stoves, Pollution due to smoke emissions, Biogas Systems: Technology of Bio-gas production,

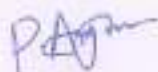
Biogas Plants , Digester types, Digester design, Dung, Vegetable Waste, Night Soil and Municipal Waste based Bio-gas plants. Application of Bio gas slurry in agriculture.

Text Books:

1. Renewable energy resources: Tiwari and ghosal, Narosa publication.
2. Non conventional Energy Sources, Khanna Publication

Reference Books:

1. Renewable Energy Sources: Twidell & Weir, CRC Press.
2. Solar Energy/ S.P. Sukhatme, Tata McGraw-Hill.
3. Non Conventional Energy Systems: K.M. Mittal, A H Wheeler Publishing Co Ltd.
4. Renewable Energy Technologies: Ramesh & Kumar, Narosa publication.
5. Biomass Energy, Oxford & IBH Publication Co.


HOD

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SCHOOL OF ARTS AND SCIENCE
DEPARTMENT OF MATHEMATICS
BOARD OF STUDIES COMMITTEE MEETING CIRCULAR

Date: 29.04.2022

There will be a Board of Studies Meeting on 05.05.2022 at 2.30 p.m in Dean Office, PRIST University, Thanjavur. All the staff members are requested to attend the meeting.

Agenda:

Curriculum

Feedback

Others

Dr. Arumugam

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A handwritten signature in black ink, appearing to be 'Dr. Arumugam', written over the printed name of the Dean.

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Ponnaiyah Ramajayam Institute of Science and Technology
PRIST Deemed to be University
School of Arts and Science
Department of Mathematics
Minutes of the meeting of the Board of Studies (BoS)*

Date : 5th May 2022
Venue : Dean Office, PRIST Block
Time : 2:30 PM

Members present:

Chair: Dr.S,Subramanian M.Sc., M.Phil., Ph.D.,
Professor in Mathematics,
School of Arts and Science
PRIST Deemed to be University, Thanjavur.

External Members

S.No.	Name/Degree/Designation	Institute/Organization/ Full address	Online/ Physical	Signature (scan, if online)
1	Dr.S.Ramasubramanian M.Sc., M.Phil., Ph.D. Assistant Professor	UCE, BIT Campus, Anna University, Trichy-24.	Physical	
2	Dr.A.Mohan M.Sc., M.Phil., Ph.D. Assistant Professor	Urumu Dhanalakshmi College of Arts and Science, Kattur, Trichy.	Physical	



Internal Members

S.No.	Name/Degree/Designation	Department	Online/ Physical	Signature (scan, if online)
1	Dr. S.Subramanian M.Sc., M.Phil., Ph.D HOD/Professor	Mathematics	Physical	
2	Dr. R. Balakumar M.Sc., M.Phil., Ph.D. Associate Professor	Mathematics	Physical	
3	Dr.D.R.Kirubaharan	Mathematics	Physical	


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	M.Sc., M.Phil., Ph.D Assistant Professor			
4	Dr. K.Selvaraj M.Sc., M.Phil., Ph.D. Assistant Professor	Mathematics	Physical	
5.	Dr.A.Usha M.Sc., M.Phil., Ph.D. Assistant Professor	Mathematics	Physical	

Invited Participants

S.No.	Name/Degree/Designation	Department/Class Institute/Organization/Address	Online/ Physical	Signature (scan, if online)
1	Dr.L.Chinnappa, MSc MTech PhD Dean School of Arts and Science	Department of Physics, PRIST Deemed to be University, Vallam, Thanjavur	Physical	

Students Representative

1. Ms. A.Agastia, I M.Sc., Mathematics (2021 Batch)

Alumina Representative

1. Ms. R.Radhiga Devi , Alumini, B.Sc Mathematics (2018 Batch)



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D. Dignassan

J. M.

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2022-2023
B.Sc & M.Sc
MATHEMATICS

MINUTES OF THE 15th BOARD OF STUDIES MEETING

Faculty: BoS

Board: Mathematics

Name of the Body	Board of Studies
Department	Mathematics
Meeting No.	15
Date and Time	05.05.2022 & 2.30p.m
Venue	Dean Office, PRIST Block
Members Attended	The details are given in the Annexure-I

**Item
No.**

AGENDA

- 1 Confirmation of the previous meeting minutes
- 2 Action taken on the previous meeting minutes
- 3 To scrutinize the stakeholder feedback on UG, PG and M.Phil curriculum
- 4 To recommend the panel of examiners for UG, PG Mathematics
- 5 Discussion on UG syllabi for Part III-Core Courses in all semester for 2022-23 Batch and onwards
- 6 Discussion on PG syllabi for core courses in all semester for 2022-23 Batch and onwards

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MINUTES OF THE 15th BOARD OF STUDIES MEETING


Faculty: BoS

Board: Mathematics

The Chairman of BoS welcomed all the Panel members for the meeting. The items listed in the agenda were taken for discussion.

The following are the minutes of the meeting.

ITEM	AGENDA
Item-01	Confirmation of the previous meeting minutes
Discussion	Minutes of the previous meeting were confirmed and accepted
Resolution	The Coordinator read the minutes of the early meeting and the minutes were reviewed and passed by the members
Item-02	Action taken on the previous meeting minutes
Discussion	The details of the action taken were presented by the members
Resolution	The members expressed satisfaction over the action taken report.
Item-03	To scrutinize the stakeholder feedback on UG, PG and M.Phil curriculum
Discussion	More courses should be offered entrepreneurship should be covered
Resolution	The Board unanimously solved to make necessary change as requests by the stake holders.
Item-04	To recommend the panel of examiners for UG, PG Mathematics
Discussion	
Resolution	The members of the board resolved to approve the continuous of the audit course


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in the curriculum

Item-05 Discussion on UG syllabi for Part III-Core Courses in all semester for 2022-23 Batch and onwards

Discussion In UG Syllabus, the panel members Dr.A.Mohan & Dr S.Ramasubramanian are suggested to revise the contents of some unit of some the papers and include new papers

The following list of papers CHANGE in contents

Sem. No	Sub. Code	Title of the Paper	Revised Units	Revision in %
I	22112AEC14	TRIGONOMETRY,ANALYTICAL GEOMETRY 3D AND CALCULUS	U-5	100%
II	22112SEC24	SEQUENCE AND SERIES	U-4	100%
III	22112AEC33	NUMBER THEORY	U-4 & 5	100%
IV	22112SEC43	OPERATIONS RESEARCH	U-4	100%
V	22112AEC51	MODERN ALGEBRA	U-5	100%
VI	22112AEC63	DISCRETE MATHEMATICS	U-3	100%

List of REPLACED PAPERS

S. No	Old Sub. Code	Old Title of the Paper	New Sub. Code	New Title of the Paper
IV	20112AEC44	ASTRONOMY	22112AEC44	IMAGE PROCESSING
VI	20112DSC64B	MATHEMATICAL MODELLING	22112DSC64B	QUANTITATIVE APTITUDE



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List of NEW Discipline Specific Electives Courses

Sl. No	Program Code	Program Name	Sub. Code	Sub. Name	Sem
1	22UGMATGE	B.Sc	22112DSC55A	Abstract Harmonic Analysis	V
2	22UGMATGE	B.Sc	22112DSC55B	Regression Analysis	V
3	22UGMATGE	B.Sc	22112DSC55C	Linear Algebra and Series	V
4	22UGMATGE	B.Sc	22112DSC55D	Mathematical Logic	V
5	22UGMATGE	B.Sc	22112DSC55E	Space Science	V
6	22UGMATGE	B.Sc	22112DSC64A	Multivariable Calculus	VI
7	22UGMATGE	B.Sc	22112DSC64B	Astronomy & Space Science	VI
8	22UGMATGE	B.Sc	22112DSC64C	Operator Theory	VI
9	22UGMATGE	B.Sc	22112DSC64D	Ergodic Theory	VI
10	22UGMATGE	B.Sc	22112DSC64E	Algebraic Geometry	VI

List of Value Added CERTIFICATE Courses

Sl. No	Program Code	Program Name	Sub. Code	Sub. Name	Sem
1	22UGMATGE	B.Sc	22512VARP	R- Programming	
2	22UGMATGE	B.Sc	22512VAS	Statistica	
3	22UGMATGE	B.Sc	22512VAM	Mathematica	


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List of Value Added DIPLOMA Courses

Sl. No	Program Code	Program Name	Subj Code	Subj Name	Sem
I	22UGMATGE	B.Sc	22512MRE	Mathematics for recruitment exam	
II	22UGMATGE	B.Sc	22512MRE	Quantitative Aptitude	

Resolution The Board approved the syllabi.

Item-06 Discussion on PG syllabi for core courses in all semester for 2022-23 Batch and onwards.

Discussion The following list of papers CHANGE in contents

Sem. No	Sub. Code	Title of the Paper	Revised Units	Revision in %
I	22212DSC15A	CLASICAL DYNAMICS	ALL UNITS	50%
I	22212DSC15B	FLUID DYNAMICS	ALL UNITS	50%
II	22212DSC25A	MATHEMATICAL PROBABILITY	ALL UNITS	50%
II	22212DSC25B	MATHEMATICAL MODELING	ALL UNITS	50%
III	22212DSC34A	CRYPTOGRAPHY	ALL UNITS	50%
III	22212DSC34B	ALGEBRIC CODING THOERY	ALL UNITS	50%
IV	22212DSC44A	COMBINATORIAL MATHEMATICS	ALL UNITS	50%
IV	22212DSC44B	DESIGN AND ANALYSIS OF ALGORITHM	ALL UNITS	50%



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List of NEW Discipline Specific Electives Courses

Sl No	Program Code	Program Name	Sub Code	Sub Name	Sem
1	22PGMATGE	M.Sc	22212DSC15A	Probability & Statistics	I
2	22PGMATGE	M.Sc	22212DSC15B	Bio-Mathematics	I
3	22PGMATGE	M.Sc	22212DSC15C	Portfolio Optimization	I
4	22PGMATGE	M.Sc	22212DSC15D	Object Oriented Programming Problem in C++	I
5	22PGMATGE	M.Sc	22212DSC15E	Finite Elements Method	I
6	22PGMATGE	M.Sc	22212DSC15F	Mathematical Finance	I
7	22PGMATGE	M.Sc	22212DSC25A	Econometrics	I
8	22PGMATGE	M.Sc	22212DSC25B	Cryptograph and Network Security	I
9	22PGMATGE	M.Sc	22212DSC25C	Information Security	I
10	22PGMATGE	M.Sc	22212DSC25D	Application of Algebra	II
11	22PGMATGE	M.Sc	22212DSC25E	Computer Graphics	II
12	22PGMATGE	M.Sc	22212DSC25F	Operating System	II
13	22PGMATGE	M.Sc	22212DSC34A	Actuarial Mathematics	II
14	22PGMATGE	M.Sc	22212DSC34B	Applied Statistical Methods	II
15	22PGMATGE	M.Sc	22212DSC34C	Actuarial Models	II
16	22PGMATGE	M.Sc	22212DSC34D	Financial Economics	II
17	22PGMATGE	M.Sc	22212DSC34E	Mathematical Cryptography	II
18	22PGMATGE	M.Sc	22212DSC34F	Time Scale	II
19	22PGMATGE	M.Sc	22212DSC44A	Mathematical Modelling	III
20	22PGMATGE	M.Sc	22212DSC44B	Mathematical Ecology	III
21	22PGMATGE	M.Sc	22212DSC44C	Artificial Intelligence	III

Dr. Divyashree

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Dr. A. S. Srinivasan

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21	22PGMATGE	M.Sc	22212DSC44C	Artificial Intelligence	V
22	22UPMATGE	M.Sc	22212DSC44D	Design of Algorithms	V
23	22PGMATGE	M.Sc	22212DSC44E	General Insurance	V
24	22PGMATGE	M.Sc	22212DSC44F	Game Theory	V

Resolution The Board approved the syllabi.

Dr. Jignesh

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SCHOOL OF ARTS AND SCIENCE

DEPARTMENT OF MATHEMATICS
B.Sc., MATHEMATICS - REGULATION 2022

COURSE STRUCTURE

SEMESTER - I

Course Code	Course Title	L	T	P	C
THEORY					
22110AEC11/ 22111AEC11/ 22132AEC11/ 22135AEC11	Tamil - I/Advanced English-I/Hindi-I/ French - I	4	0	0	2
22111AEC12	English-I	4	0	0	2
22112AEC13	Differential Calculus and Vector Calculus	5	0	0	3
22112AEC14	Trigonometry, Analytical Geometry 3D and Calculus	5	0	0	3
22120AEC15	Programming in C	6	0	0	5
PRACTICAL					
22120AEC16L	Programming in C Lab	0	0	3	2
Total		24	0	3	17
AUDIT COURSE					
221ACLSICN	Indian Constitution	-	-	-	2
221ACLSUHV	Universal Human Values	-	-	-	2

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SEMESTER – II

Course Code	Course Title	L	T	P	C
THEORY					
22110AEC21/ 22111AEC21/ 22132AEC21/ 22135AEC21	Tamil – II/ Advanced English-II/Hindi-II/ French – II	4	0	0	2
22111AEC22	English-II	4	0	0	2
22112AEC23	Integrals & Differential Equations	5	0	0	3
22112SEC24	Sequence and series	5	0	0	3
22120AEC25	Web Programming	5	1	0	5
PRACTICAL					
22120AEC26L	Web Programming Lab	0	0	3	2
RESEARCH SKILL BASED COURSE					
22112RLC27	Research Led Seminar	-	-	-	1
	Total	23	1	3	18
AUDIT COURSES					
221ACLSCOS	Communication Skills	-	-	-	2
221ACSSBBE	Basic Behavioral Etiquette	-	-	-	2

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SEMESTER – III

Course Code	Course Title	L	T	P	C
THEORY					
22110AEC31/ 22132AEC31/ 22111AEC31/ 22135AEC31	Tamil – III/Hindi-III/Advanced English-III/ French – III	4	0	0	2
22111AEC32	English-III	4	0	0	2
22112AEC33	Number Theory	4	0	0	3
22112AEC34	Numerical Analysis	4	0	0	3
22118AEC35	Mathematical Statistics-I	5	1	0	5
PRACTICAL					
22118AEC36L	Mathematical Statistics-I Lab	0	0	3	2
RESEARCH SKILL BASED COURSE					
22112RMC37	Research Methodology	2	0	0	2
Total		23	1	3	19
AUDIT COURSE					
201ACLSOAN	Office Automation	-	-	-	2

SEMESTER – IV

Course Code	Course Title	L	T	P	C
THEORY					
22110AEC41/ 22111AEC41/ 22132AEC41/ 22135AEC41	Tamil-IV/Advanced English-IV /Hindi-IV/ French – IV	4	0	0	2

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22111AEC42	English-IV	4	0	0	2
22112SEC43	Operations Research	4	0	0	3
22112AEC44	Image Processing	4	0	0	3
221ENSTU45	Environmental Studies	2	0	0	2
22118AEC46	Mathematical Statistics-II	5	1	0	5
PRACTICAL					
22118AEC47L	Mathematical Statistics- II Lab	0	0	3	2
	Total	23	1	3	19
AUDIT COURSE					
221ACLSLMS	Leadership and Management Skills	-	-	-	2
221ACSSAQA	General Aptitude and Quantitative Ability				2

SEMESTER – V

Course Code	Course Title	L	T	P	C
THEORY					
22112AEC51	Modern Algebra	5	0	0	4
22112AEC52	Real Analysis	5	1	0	4
22112SEC53	Statics	5	1	0	4
22112SEC54	Programming in C++	5	0	0	3
22112DSC55_	Discipline Specific Elective -I	5	0	0	3
RESEARCH SKILL BASED COURSE					
22112BRC56	Participation in Bounded Research	-	-	-	1
	Total	25	2	0	19
AUDIT COURSE					
221ACLSPSL	Professional Skills	-	-	-	2



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SEMESTER – VI


Course Code	Course Title	L	T	P	C
THEORY					
22112AEC61	Complex Analysis	5	0	0	4
22112SEC62	Dynamics	5	1	0	4
22112AEC63	Discrete Mathematics	5	0	0	4
22112DSC64_	Discipline Specific Elective –II	5	0	0	4
221__OEC(2 Digit Course Name)	Open Elective	4	0	0	2
PRACTICAL					
22112PRW65	Project Work	-	-	-	4
22112PROEE	Program Exit Examination	-	-	-	1
	Total	24	1	0	23
AUDIT COURSE					
221ACSSIST	Interview Skills Training and Mock Test	-	-	-	2
221ACLSCET	Community Engagement	-	-	-	1
Total Credits -Programme					115
Total Credits - Audit Courses					19

Discipline Specific Electives

Sl. No	Program Code	Program Name	Sub. Code	Sub. Name	Sem
1	22UGMATGE	B.Sc	22112DSC55A	Abstract Harmonic Analysis	V
2	22UGMATGE	B.Sc	22112DSC55B	Regression Analysis	V
3	22UGMATGE	B.Sc	22112DSC55C	Linear Algebra and Series	V
4	22UGMATGE	B.Sc	22112DSC55D	Mathematical Logic	V



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5	22UGMATGE	B.Sc	22112DSC55E	Space Science	V
6	22UGMATGE	B.Sc	22112DSC64A	Multivariable Calculus	VI
7	22UGMATGE	B.Sc	22112DSC64B	Astronomy & Space Science	VI
8	22UGMATGE	B.Sc	22112DSC64C	Operator Theory	VI
9	22UGMATGE	B.Sc	22112DSC64D	Ergodic Theory	VI
10	22UGMATGE	B.Sc	22112DSC64E	Algebraic Geometry	VI

Value Added Courses

Certificate Course	Title of the Value Added Courses
1	Mathematica
2	Quantitative Aptitude
3	Machine Learning
4	Lie groups and Lie Algebra
5	Machine learning and Artificial Intelligence


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VALUE ADDED COURSES



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Course Code	Course Title	L	T	P	C
22512VAM	Mathematica	4	0	0	2

Duration: 45 Hours

Course Objectives:

Learn the applications of mathematics in real life problems. Understand the suitable methods to adopt the problem using several mathematical concepts.

Unit I:

Solving higher degree equations. Solving system of equations by matrix method and find the eigen values and eigen vectors of a matrix of order 4 by 4 or higher order

Unit II:

Solving system of non-linear equations. Finding the differentiation of different functions of second and third derivatives.

Unit III:

Finding the Integration of different functions with limits. Evaluation of double integrals and triple integrals.

Unit IV:

Solving ordinary differential equations with initial condition. Solving systems of ordinary differential equations.

Unit V:

Creating and plotting 2-D and 3-D graphs. Solving Linear programming problems. Self-study portion.

Text Books:

T.B-1 : Eugene Doe, Mathematica, Schaum's Outline Series, Mc Graw Hill Publisher, New York. (2000)

T.B-2 : Pragathi Gautam and Swapnil Verma, Practical Mathematica, Aze Books Publisher (2019).

Books for Reference:

1. Ananta Kumar Bora. Mathematica: A Research Book of Mathematics, Scholarlink Publishers (2017)

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Course Code	Course Title	L	T	P	C
22512QA	Quantitative Aptitude	4	0	0	2

Objectives:

Learn the applications of mathematics in real life problems. Understand the suitable methods to adopt the problem using several mathematical concepts.

Unit 1: Problems on Arithmetic Aptitude, Average, Clock

Unit-2: Problems on Calander, Compound Interest

Unit-3: Problems on HCF & LCM, Number System

Unit 4: Problems on Percentage, Permutation and Combinations

Unit 5: Problems on Ages, Boats, Train

Reference: Quantitative Aptitude by R.S. Aggarwall

Course Outcomes:

1. To learn a new programming language, beginner in the field of data science.
2. To kindle the problem solving ability of the students in statistics.

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Course Code	Course Title	L	T	P	C
22512QA	Quantitative Aptitude	4	0	0	2

Objectives:

Learn the applications of mathematics in real life problems. Understand the suitable methods to adopt the problem using several mathematical concepts.

Unit 1: Problems on Arithmetic Aptitude, Average, Clock

Unit-2: Problems on Calender, Compound Interest

Unit-3: Problems on HCF & LCM, Number System

Unit 4: Problems on Percentage, Permutation and Combinations

Unit 5: Problems on Ages, Boats, Train

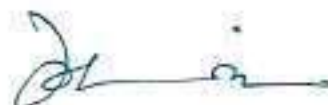
Reference: Quantitative Aptitude by R.S. Aggarwall

Course Outcomes:

1. To learn a new programming language, beginner in the field of data science.
2. To kindle the problem solving ability of the students in statistics.



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Course Code	20512ML	TITLE OF THE COURSE	L	T	P	C
Value Added		MACHINE LEARNING	4	1	-	4
Pre-requisite		Knowledge in basic algebra	Syllabus Version		2021-22	

Course Objectives

The main objectives of this course are to:

- ❖ To Learn about Machine Intelligence and Machine Learning applications To implement and apply machine learning algorithms to real-world applications.
- ❖ To identify and apply the appropriate machine learning technique to classification, pattern recognition, optimization and decision problems.
- ❖ To understand how to perform evaluation of learning algorithms and model selection.
- ❖ To understand about the basic theory of problem solving paradigms and search strategies in artificial intelligence
- ❖ To make the students familiar with knowledge representation, planning, learning, natural language processing and robotics

Expected Course Outcomes

On completion of the course students will be expected to:

1	Have a good understanding of the fundamental issues and challenges of machine learning: data, model selection, model complexity, etc	K2
2	Have an understanding of the strengths and weaknesses of many popular machine learning approaches	K4
3	Appreciate the underlying mathematical relationships within and across Machine Learning algorithms and the paradigms of supervised and unsupervised learning	K3
4	Be able to design and implement various machine learning algorithms in a range of real-world applications	K3
5	Understand the computation intelligence	K6

K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 - Evaluate; K6 – Create

Unit:1	Introduction to ML
Unit:2	Fundamentals of ML
Unit:3	Selected Algorithms
Unit:4	Neural Network Learning
Unit:5	Key Concepts from ML

Books for Study

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1	Marc Peter Deisenroth, A. Aldo Faisal, Cheng Soon Ong, Mathematics for Machine Learning, Cambridge University Press (23 April 2020)
2	Tom M. Mitchell- Machine Learning - McGraw Hill Education, International Edition

Dr. Sugumar

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Course Code	22512LGLA	TITLE OF THE COURSE	L	T	P	C
Value Added		LIE GROUPS & LIE ALGEBRAS	4	1	-	4
Pre-requisite		Knowledge in basic algebra	Syllabus Version		2021-22	

Course Objectives

The main objectives of this course are to:

1. In physics, Lie groups appear as symmetry groups of physical systems, and their Lie algebras (tangent vectors near the identity) may be thought of as infinitesimal symmetry motions.
2. Lie algebras and their representations are used extensively in physics, notably in quantum mechanics and particle physics.

Expected Course Outcomes

On the successful completion of the course, student will be able to:

1	Understand the basics of R Language	K2
2	Apply the logical skills for performing statistical analysis	K4
3	Use appropriate plots, charts and diagrams for all kinds of data	K3
4	Perform parametric methods	K3
5	Write and execute the code for multivariate analysis	K6

K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 - Evaluate; K6 – Create

Unit:1

Matrix-Lie Groups

Unit:2

The Matrix Exponential

Unit:3

Lie Algebras

Unit:4

Basic Representation Theory

Unit:5

Semi-simple Lie Algebras

Books for Study

- 1 Brain Hall, Lie Groups, Lie Algebras and Representations: An Elementary Introduction (Second Edition), Springer, USA, 2015.

Reference Books

- 1 V. S. Varadarajan, Lie groups, Lie algebras and their representations, Springer 1984.
- 2 A. W. Knap, Representation theory of semi-simple Lie groups. An overview based on examples, Princeton university press 2002.
- 3 S. Kumaresan S, A course in differential geometry and Lie groups, Texts and Readings in Mathematics, 22. Hindustan Book Agency, New Delhi, 2002.

Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]

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Course Code	22512MLAI	TITLE OF THE COURSE	L	T	P	C
Value Added		MACHINE LEARNING AND ARTIFICIAL INTELLIGENCE	4	1	-	4
Pre-requisite		Knowledge in basic algebra	Syllabus Version		2022-23	

Course Objectives

The main objectives of this course are to:

- ❖ To Learn about Machine Intelligence and Machine Learning applications To implement and apply machine learning algorithms to real-world applications.
- ❖ To identify and apply the appropriate machine learning technique to classification, pattern recognition, optimization and decision problems.
- ❖ To understand how to perform evaluation of learning algorithms and model selection.
- ❖ To understand about the basic theory of problem solving paradigms and search strategies in artificial intelligence
- ❖ To make the students familiar with knowledge representation, planning, learning, natural language processing and robotics

Expected Course Outcomes

On completion of the course students will be expected to:

1	Have a good understanding of the fundamental issues and challenges of machine learning: data, model selection, model complexity, etc	K2
2	Have an understanding of the strengths and weaknesses of many popular machine learning approaches	K4
3	Appreciate the underlying mathematical relationships within and across Machine Learning algorithms and the paradigms of supervised and unsupervised learning	K3
4	Be able to design and implement various machine learning algorithms in a range of real-world applications	K3
5	Understand the computation intelligence	K6

K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 - Evaluate; K6 - Create

Unit:1	INTRODUCTION
	Learning Problems - Perspectives and Issues - Concept Learning - Version Spaces and Candidate Eliminations - Inductive bias - Decision Tree learning
Unit:2	NEURAL NETWORKS AND GENETIC ALGORITHMS
	Neural Network Representation - Problems - Perceptrons - Multilayer Networks and Back Propagation Algorithms - Advanced Topics - Genetic Algorithms- Hypothesis Space Search -
Unit:3	BAYESIAN AND COMPUTATIONAL LEARNING
	Bayes Theorem - Concept Learning - Maximum Likelihood - Minimum Description Length Principle - Bayes Optimal Classifier

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Unit:4	INTRODUCTION
	Introduction - Intelligent Agents- Problem Solving - by Searching - Informed Search Strategies- Optimization Problems - Adversarial Search-Knowledge and Reasoning - Logical Agents - First-Order Logic - Inference in First-Order Logic - Knowledge Representation
Unit:5	PLANNING
	Planning – Planning and Acting in the Real World - Uncertain knowledge and reasoning - Uncertainty - Probabilistic Reasoning - Probabilistic Reasoning over Time - Making Simple Decisions - Making Complex Decisions
Books for Study	
1	Tom M. Mitchell,—Machine Learning, McGraw-Hill Education (India) Private Limited, 2013.
2	Stuart Russell, Peter Norvig, "Artificial Intelligence: A Modern Approach," Third Edition, Prentice Hall of India, New Delhi, 2010.
Reference Books	
1	EthemAlpaydin,—Introduction to Machine Learning (Adaptive Computation and Machine Learning), The MIT Press 2004.
2	Stephen Marsland,—Machine Learning: An Algorithmic Perspective, CRC Press,2009.
3	Michael Affenzeller, Stephan Winkler, Stefan Wagner, Andreas Beham, —Genetic Algorithms and Genetic Programming II ,CRC Press Taylor and Francis Group
Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]	
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Value Added Courses

Diploma Course	Title of the Value Added Courses
1	Mathematics for recruitment exam
2	R-programming
3	Statistica



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Course Code	Course Title	L	T	P	C
22512VAMRE	Mathematics for recruitment Exam	4	0	0	2

Objectives:

Learn the applications of mathematics in real life problems. Understand the suitable methods to adopt the problem using several mathematical concepts.

Unit 1: Problems on Divisibility, remainders, Number Properties

Unit-2: Problems on Polynomials equations, Percentage, Permutation and Combinations

Unit-3: Problems on HCF & LCM, Number System

Unit 4: Problems on Percentage, Permutation and Combinations

Unit 5: Problems on Times, speed, distance

Reference: Quantitative Aptitude by R.S. Aggarwall

Course Outcomes:

1. To learn a new programming language, beginner in the field of data science.
2. To kindle the problem solving ability of the students in statistics.

A. Arivudanathan

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Course Code	Course Title	L	T	P	C
22512VARP	R Programming	4	0	0	2

Objectives:

Learn the applications of mathematics in real life problems. Understand the suitable methods to adopt the problem using several mathematical concepts.

Unit I: Simple Programs using Mathematical constant ,Programs using complex functions

Unit II: Numerical solutions of nonlinear equations and systems , Solving system of linear equations using Jacobi method

Unit III: Program using Trigonometric and Hyperbolic Expressions 6. Finding Eigen values and Eigen vectors

Unit IV: Plotting Points in the Plane and Space ,Analyze data using Central Tendency and Measures of dispersion and distributions

Unit V: Find the Laplace integral transforms for different functions. Obtain the solution of the initial value problem Books for

Reference:

1. Programming with R by S.R. Mani Sekhar, T.V. Suresh Kumar, Madhavi Kasa, Sunil Kumar S. Manvi, Cengage Learning India Pvt. Ltd, 2017
2. R for Statistics by Pierre-Andre Cornillon, Arnaud Guyader, Francois Husson, Nicolas Jegou, Julie Josse, Maela Kloareg, Eric Matzner-Lober, Laurent Rouvière, Chapman and Hall, 2012
3. Statistics with R Programming by Dr. Sandip Rakshit, McGraw Hill Education (India) Pvt. Ltd, 2018

Course Outcomes:

1. To learn a new programming language, beginner in the field of data science.
2. To kindle the problem solving ability of the students in statistics.

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Course Code	Course Title	L	T	P	C
22512VAS	STATISTICA	4	0	0	2
Unit-1	Statistical Methods: Definition and scope of Statistics, concepts of statistical population and sample. Data: quantitative and qualitative, attributes, variables, scales of measurement nominal, ordinal, interval and ratio.				
Unit-2	Measures of Central Tendency: mathematical and positional. Measures of Dispersion: range, quartile deviation, mean deviation, standard deviation, coefficient of variation,				
Unit-3	correlation. Simple linear regression, principle of least squares and fitting of polynomials and exponential curves				
Unit-4	Index Numbers: Definition, construction of index numbers and problems thereof for weighted and unweighted index numbers including Laspeyre's, Paasche's, Edgeworth- Marshall and Fisher's Ideal Index numbers. Errors in Index numbers.				
Unit-5	Chain index numbers, conversion of fixed based to chain based index numbers and vice-versa. Consumer price index numbers. Uses and limitations of index numbers.				
Reference	Goon A.M., Gupta M.K. and Dasgupta B. (2002): Fundamentals of Statistics, Vol. I & II, 8th Edn. The World Press, Kolkata. 2. Gupta, S. C. and Kapoor, V.K. (2008): Fundamentals Of Mathematical Statistics, 4 thEdition (Reprint), Sultan Chand & Sons				

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Open Electives

Semester	Open Elective Courses
VI	a) 221TNOEC-Tamil IlakkiyaVaralaru b) 221ENOECE-Journalism c) 221PHOEC-Instrumentation d) 221CEOEC-Food and Adulteration e) 221MBOEC- Wildlife Conservation f) 221CSOEC – E-Learning g) 221CAOEC-Web Technology h) 221CMOEC-Banking service

Credit Distribution

Sem	AEC	SEC	DSC	OEC	Research	Others	Total
I	17	-	-	-	-	-	17
II	13	4	-	-	1	-	18
III	17	-	-	-	2	-	19
IV	14	3	-	-	-	2	19
V	8	7	3	-	1	-	19
VI	8	4	4	2	4	1	23
Total	77	18	7	2	8	3	115

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15th
80%

NEW Course

Faculty: BAS

Board: Mathematics

Semester: VI

Course Code	2221205C55A Abstract Harmonic Analysis
I	Groups and Homogenous spaces, linear Lie groups, Computation of Haar measures on some known examples, Convolution Various function spaces.
II	Harmonic Analysis over Torus and Euclidean spaces. Generalities about locally compact abelian groups, which includes Fourier Inversion Formula, Bochner's theorem.
III	Basic Representation Theory, Induced representations, Positive Definite functions, Schur's lemma, Naimark Theorem
IV	Peter-Weyl Theory of compact groups- Examples: Unitary groups, Orthogonal groups.
V	Abstract Theory of Gelfand Pairs, Spherical Fourier Transforms, Plancherel-Godement Theorem, Inverse Spherical Fourier Transforms, Compact Gelfand Pair.
Text Books:	1. G. B. Folland, "A Course in Abstract Harmonic Analysis", CRC Press, 2000
Reference:	1. H. Helson, "Harmonic Analysis", Texts and Readings in Mathematics, Hindustan Book Agency, 2010. 2. Y. Katznelson, "An Introduction to Harmonic Analysis", Cambridge University Press, 2004.

Percentage of Syllabus Revised: 100%

Course Focuses on:

✓	Skill Development	✓	Entrepreneurial Development
✓	Employability		Innovations
	Intellectual Property Rights		Gender Sensitization
	Social Awareness/ Environment		Constitutional Values/Ethics Rights/Human

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15th
BOS

NEW Course

Faculty: BAS

Board: Mathematics

Semester: VI

Course Code	22112DSC55B Regression Analysis
I	Introduction to simple linear regression, least square estimation and hypothesis testing of model parameters, prediction, interval estimation in simple linear regression
II	Coefficient of determination, estimation by maximum likelihood, multiple linear regression, matrix representation of the regression model
III	estimation and testing of model parameters and prediction, model adequacy checking-residual analysis, PRESS statistics, outlier detection, lack of fit test
IV	serial correlation and Durbin-Watson test, transformation and weighting to correct model inadequacies-variance-stabilizing transformation, generalized and weighted least squares, diagnostics for influential observations
V	Cook's D test, multicollinearity-sources and effects, diagnosis and treatment for multicollinearity, ridge regression and LASSO, bootstrap estimation, dummy variable model, variable selection and model building
Text Books:	1. Douglas C. Montgomery, Elizabeth A. Peck, G. Geoffrey Vining, "Introduction to Linear Regression Analysis", 5th Edition, Wiley, 2012.
Reference:	1. N. R. Draper and H. Smith (1998), Applied Regression Analysis, 3rd Edition, New York: Wiley. 2. Michael H. Kutner, Chris J. Nachtsheim, and John Neter, "Applied Linear Statistical Models", McGraw-Hill/Irwin; 5th edition, 2004.

Percentage of Syllabus Revised: 100%

Course Focuses on:

	Skill Development		✓ Entrepreneurial Development
✓	Employability		Innovations
	Intellectual Property Rights		Gender Sensitization
	Social Awareness/ Environment	✓	Constitutional Values/Ethics Rights/Human

S. S. Srinivasan

H.O.D.

DEPARTMENT OF MATHEMATICS
PRIST DEEMED TO BE UNIVERSITY
THANJAVUR - 613 403

S. S. Srinivasan
Dean

School of Arts & Science
Ponnalyah Ramalingam Institute of
Science & Technology (PRIST)
Deemed to be University
Thanjavur - 613 403.

	<h1>PRIST</h1> <p>DEEMED TO BE UNIVERSITY NAAC ACCREDITED THANJAVUR – 613 403 - TAMILNADU</p>	<p>15th BOS</p>
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NEW Course

Faculty: BAS

Board: Mathematics

Semester: V

Course Code	22112DSC55C		
Title	LINEAR ALGEBRA AND SERIES		
UNIT	Contents		
I	Rational and Jordan canonical forms, Inner product spaces,		
II	Unitary and Normal operators, Forms on inner product spaces		
III	Spectral theorems, Bilinear forms, Matrix decomposition theorems.		
IV	Courant- Fischer minimax and related theorems, Nonnegative matrices		
V	Perron-Frobenius theory, Generalized inverse, Matrix Norm, Perturbation of eigenvalues.		
Text Books:	Reference Books 1. K. Hoffman, R. Kunze, "Linear Algebra", Prentice-Hall of India, 2012.		
Reference:	1. S. Roman, "Advanced Linear Algebra", Graduate Texts in Mathematics 135, Springer, 2008. 2. R. A. Horn, C. R. Johnson, "Matrix Analysis", Cambridge University Press, 2010		
Percentage of Syllabus Revised: 100%			
Course Focuses on:			
✓	Skill Development	✓	Entrepreneurial Development
✓	Employability		Innovations
	Intellectual Property Rights		Gender Sensitization
	Social Awareness/ Environment		Constitutional Values/Ethics Rights/Human

J. J. J. J.

H.O.D.

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J. J. J. J.

Dean

School of Arts & Science
Ponnalyah Reddy Nayam Institute of
Science & Technology (PRIST)
Chennai

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NEW Course

Faculty: BAS

Board: Mathematics

Semester: V

Course Code	22112DSC55D
Title	Mathematical Logic
UNIT	Contents
I	Introduction, propositions, truth table, negation, conjunction and disjunction. Implications, biconditional propositions, converse, contra positive and inverse propositions and precedence of logical operators.
II	General Notions : Formal language, object and meta language, general definition of a Formal Theory/Formal Logic
III	Propositional Logic : Formal theory for propositional calculus, derivation, proof, theorem, deduction theorem, conjunctive and disjunctive normal forms, semantics, truth tables, tautology, adequate set of connectives, applications to switching circuits, logical consequence, consistency, maximal consistency, Leindenbaum lemma, soundness and completeness theorems, algebraic semantics
IV	Predicate Logic : First order language, symbolizing ordinary sentences into first order formulae, free and bound variables, Interpretation and satisfiability, models, logical validity, formal theory for predicate calculus,
V	theorems and derivations, deduction theorem, equivalence theorem, replacement theorem, choice rule, Prenex normal form, soundness theorem, completeness theorem, compactness theorem, First Order Theory with equality, examples of First Order Theories (groups, rings, fields etc.).
Text Books:	Mendelson; Introduction to mathematical logic; Chapman & Hall; London(1997) Angelo Margaris; First order mathematical logic; Dover publications, Inc, New York (1990).
Reference:	S.C.Kleene; Introduction to Metamathematics; Amsterdam; Elsevier (1952). J.H.Gallier; Logic for Computer Science; John.Wiley & Sons (1987). H.B.Enderton; A mathematical introduction to logic; Academic Press; New York (1972)

Percentage of Syllabus Revised: 100%

Course Focuses on:

✓	Skill Development	✓	Entrepreneurial Development
✓	Employability		Innovations
	Intellectual Property Rights		Gender Sensitization
	Social Awareness/ Environment		Constitutional Values/Ethics Rights/Human

S. S. Srinivasan

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NEW Course

Faculty: BAS

Board: Mathematics

Semester: VI

Course Code	22112DSC55E SPACE SCIENCE	
I	History of Astronomy and Apparent Luminosity of Stars: Ptolemy's astronomical work, Copernican heliocentrism and Tychoonian system, Luminosity (Apparent and Absolute) of stars, Magnitude scale, Luminosity measurement: 1) Visual Method 2) Photographic method and 3) Photoelectric method..	
II	Stellar Evolution (HR diagram): Life cycle; Stellar Processes (Nuclear) and spectral classification of Stars O, B, A, F, G, K, M.	
III	The Sun and Planets Origin of the solar system, Internal structure and surface features of sun, Sun spots and Magnetic field on the sun and Solar activity.	
IV	Moon Phases, Tidal forces and Tidal locking	
V	Asteroids, Meteors, Comets and Galaxies: Asteroids: Discovery and designation, Origin, Nature and Orbits of Asteroids. Meteors : Meteor showers and sporadic meteors. Comets : Periodic comets, Brightness variation in Comets. Gas production rates, dust and ion tails.	
Text Books:	1. Astronomy structure of the Universe. A.E. Roy and D. Clarke, Adam Hilger Pub. 2. Source Book of Space Sciences, Samuel Galsstone; D.VanNostrand Co. Inc 3. Textbook of Astronomy and Astrophysics with elements of cosmology, V.B. Bhatia, NarosaPub.	
Reference:	Introduction to Astrophysics - Baldyanath Basu 6. Astrophysics: Stars and Galaxies- K.D.Abhyankar: Tata McGraw Hill Publication(Chap. " Astrophysics: A modern Perspective" - K. S. Krishnaswami New Age International. K. S. Krishnaswami, "Understanding cosmic Panorama" New Age International. 9. Frontiers in Astronomy by Jastrow	
Percentage of Syllabus Revised: 100%		
Course Focuses on:		
✓	Skill Development	✓ Entrepreneurial Development
✓	Employability	Innovations
	Intellectual Property Rights	Gender Sensitization
	Social Awareness/ Environment	Constitutional Values/Ethics Rights/Human

Dr. Jaganathan

H.O.D.

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Thanjavur - 613 403



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15th
BOS

NEW Course

Faculty: BAS

Board: Mathematics

Semester: VI

Course Code	22112DSC64A	Multivariable Calculus
I	Introduction to multivariable calculus, Vectors and matrices, Visualizing scalar valued functions, vector-valued functions, Transformations, multi variable functions	
II	Partial derivatives, Gradient and directional derivatives, partial derivative and gradient, Differentiating parametric curves, chain rule, curvature.	
III	Tangent planes and local linearization, Quadratic approximations, optimizing multivariable functions, optimiziang multivariable functions. Applications of multivariable .	
IV	Line intergrals for scalar functions, vector fields, double integrals, Triple integrals, change of variables, polar , spherical and cylindrical coordinates. Applications of multivariable.	
V	Green's theorem, stokes and divergence theorem ., Application of multivariable.	
Text Books:	S.C.Kleene; Introduction to Metamathematics; Amsterdam; Elsevier (1952).	
Reference:	J.H.Gallier; Logic for Computer Science; John.Wiley & Sons (1987). H.B.Enderton; A mathematical introduction to logic; Academic Press; New York (1972)	

Percentage of Syllabus Revised: 100%

Course Focuses on:

	Skill Development	✓	Entrepreneurial Development
	Employability		Innovations
✓	Intellectual Property Rights		Gender Sensitization
✓	Social Awareness/ Environment	✓	Constitutional Values/Ethics
			Rights/Human

Dr. S. Srinivasan

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Dr. S. Srinivasan

Dean

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NEW Course

Faculty :BAS

Board: Mathematics

Semester: VI

Course Code	22112DSC64B Astronomy & Space Science		
I	Celestial Sphere, various Coordinate Systems, transformation formulae among various coordinate systems, formulae of spherical triangle : cosine formula, sine formula, four parts formula , analogous cosine formula, hour angle, sidereal day, sidereal time, equation of time. Exercises.		
II	Light and its properties, Optical , absorption, emission and continuous spectra, radio and Hubble Space Telescopes (HST), Photometry, Spectrometry, Spectrophotometry (definitions only), magnification, resolution, f/a ratio , refractors and reflectors. Exercises.		
III	Various magnitudes of stars: apparent, absolute, photovisual, photographic, bolometric etc. Distance measurements of stars: Parallax method, Statistical Palallax Method, Moving Cluster Method. Radial and proper motion. Exercises. • Morphological structure of Sun, solar cycles, sunspots, solar corona, solar wind, solar neutrino puzzle (Merely descriptive models). Solar system.		
IV	Interstellar matter, elastic collisions and kinetic equilibrium, Jeans Mass for gravitational collapse, radiative process (statement only).		
V	Morphological classification of galaxies, rotation curves and mass modelling, missing mass and dark matter, distance determination by various methods. Our Galaxy. Exercises		
Text Books:	Padmanabhan, Theoretical Astrophysics, vols. 1-3, Cambridge University Press, 2002. S. Weinberg, Gravitation and Cosmology, Wiley, 2001. J.V. Narlikar, Introduction to Cosmology, Cambridge University Press, 2002.		
Reference:	J.V. Narlikar, An Introduction to Relativity, Cambridge University Press, 2010. B.Basu, T.Chattopadhyay and S.N.Biswas, An Introduction to Astrophysics, Prentice Hall of India, 2010. Physical Processes in the Interstellar Medium, Lyman Spitzer, Jr. Wiley, 1998. Astrophysics for Physicists, Arnab Rai Choudhuri, Cambridge University Press, 2010.		
Percentage of Syllabus Revised: 100%			
Course Focuses on:			
	Skill Development	✓	Entrepreneurial Development
	Employability		Innovations

S. Srinivasan

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✓	Intellectual Property Rights		Gender Sensitization
✓	Social Awareness/ Environment	✓	Constitutional Values/Ethics Rights/Human



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NEW Course

Faculty: BAS

Board: Mathematics

Semester: VI

Course Code	22212DSC25C Operator Theory
I	Review of Hilbert space Theory , Bounded operators on Hilbert spaces, examples
II	Adjoint an operator, examples, Self-adjoint, normal, positive.
III	Unitary, isometries, partial isometries.
IV	Orthogonal projections with examples, invariant subspaces.
V	Numerical range and characterization of operators.
Text Books:	1.W. Arveson, "An invitation to C*-algebras", Graduate Texts in Mathematics, No. 39. Springer-Verlag, 1976
Reference:	<p>1.N. Dunford and J. T. Schwartz, "Linear operators. Part II: Spectral theory. Self adjoint operators in Hilbert space", Interscience Publishers John Wiley i& Sons 1963.</p> <p>2.R. V. Kadison and J. R. Ringrose, "Fundamentals of the theory of operator algebras. Vol. I. Elementary theory", Pure and Applied Mathematics, 100, Academic Press, Inc., 1983.</p>

Percentage of Syllabus Revised: 100%

Course Focuses on:			
✓	Skill Development	✓	Entrepreneurial Development
✓	Employability		Innovations
	Intellectual Property Rights		Gender Sensitization
	Social Awareness/ Environment		Constitutional Values/Ethics Rights/Human

S. Srinivasan

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NEW Course

Faculty: BAS

Board: Mathematics

Semester: VI

Course Code	22112DSC15D Ergodic Theory		
I	Measure preserving systems; examples: Hamiltonian dynamics and Liouville's theorem, Bernoulli shifts, Markov shifts, Rotations of the circle, Rotations of the torus, Automorphisms of the Torus, Gauss transformations		
II	Skew-product, Poincare Recurrence lemma: Induced transformation: Kakutani towers: Rokhlin's lemma. Recurrence in Topological Dynamics		
III	Birkhoff's Recurrence theorem, Ergodicity, Weak-mixing and strong-mixing and their characterizations, Ergodic Theorems of Birkhoff and Von Neumann. Consequences of the Ergodic theorem.		
IV	Invariant measures on compact systems, Unique ergodicity and equidistribution. Weyl's theorem, The Isomorphism problem; conjugacy, spectral equivalence, Transformations with discrete spectrum		
V	Halmos-von Neumann theorem, Entropy. The Kolmogorov-Sinai theorem. Calculation of Entropy. The Shannon Mc-Millan-Breiman Theorem, Flows. Birkhoff's ergodic Theorem and Wiener's ergodic theorem for flows. Flows built under a function.		
Text Books:	1. Peter Walters, "An introduction to ergodic theory", Graduate Texts in Mathematics, 79. Springer-Verlag, 1982. Patrick Billingsley,		
Reference:	"Ergodic theory and information", Robert E. Krieger Publishing Co., 1978. M. G. Nadkarni, "Basic ergodic theory", Texts and Readings in Mathematics		
Percentage of Syllabus Revised: 100%			
Course Focuses on:			
✓	Skill Development	✓	Entrepreneurial Development
✓	Employability		Innovations
	Intellectual Property Rights		Gender Sensitization
	Social Awareness/ Environment		Constitutional Values/Ethics Rights/Human

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NEW Course

Faculty: BAS

Board: Mathematics

Semester: VI

Course Code	22112DSC55E ALGEBRAIC GEOMETRY	
I	Classical linear algebra revisited with a geometric perspective: fundamental theorem, determinants, Jordan normal form	
II	Basic definitions and first examples from algebraic geometry: e.g., varieties, Zariski topology, regular and rational maps, incidence correspondences, Grassmannians, determinantal varieties, secant varieties.	
III	Examples of elementary questions in linear algebra that lead to deep and open questions in algebraic geometry	
IV	rational maps and function fields, nonsingularity, smooth varieties. The course will try to stress the nexus between Commutative Algebra and Algebraic Geometry	
V	Affine Varieties, Hilbert's Basis Theorem and the Hilbert Nullstellensatz, projective and quasi-projective varieties, morphisms,	
Text Books:	Landsberg, J. M. "Tensors: geometry and applications". Graduate Studies in Mathematics, 128. American Mathematical Society, Providence, RI, 2012. xx+439 pp. ISBN: 978-0-8218-6907-9	
Reference:	Shafarevich, Igor R. "Basic algebraic geometry. I. Varieties in projective space". Third edition. Translated from the 2007 third Russian edition. Springer, Heidelberg, 2013. xviii+310 pp. ISBN: 978-3-642-37955-0; 978-3-642-37956-7	
Percentage of Syllabus Revised: 100%		
Course Focuses on:		
✓	Skill Development	✓ Entrepreneurial Development
✓	Employability	Innovations
	Intellectual Property Rights	Gender Sensitization
	Social Awareness/ Environment	Constitutional Values/Ethics Rights/Human

Dr. J. Jeyaraj

H.O.D.

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Dr. J. Jeyaraj

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M.Sc., MATHEMATICS - CURRICULUM - REGULATION 2022

COURSE STRUCTURE

Course Code	Course Title	L	T	P	C
SEMESTER I					
22212AEC11	Algebra	5	1	0	4
22212AEC12	Real Analysis	5	1	0	4
22212AEC13	Ordinary Differential Equations	5	1	0	4
22220SEC14	C++ Programming	5	1	0	4
22212DSC15_	Discipline Specific Elective - I	5	0	0	4
22212RLC16	Research Led seminar	-	-	-	1
	Total	25	4	0	21
SEMESTER II					
22212AEC21	Complex Analysis	5	1	0	4
22212AEC22	Measure Theory and Integration	5	0	0	4
22212SEC23	Mathematical Methods	5	1	0	4
22212AEC24	Graph Theory	5	0	0	4
22212DSC25_	Discipline Specific Elective - II	5	0	0	4
22212RMC26	Research Methodology	3	0	0	2
22212BRC27	Participation in Bounded Research	-	-	-	2
	Total	28	2	0	24
SEMESTER III					
22212AEC31	Topology	5	1	0	5
22212SEC32	Stochastic Process	5	2	0	5
22212AEC33	Advanced Numerical Analysis	5	2	0	5
22212DSC34_	Discipline Specific Elective - III	5	0	0	4
222__OEC	Open Elective	4	0	0	3
22212SRC36	Participation in Scaffold Research (Societal Project)	-	-	-	2
	Total	24	5	0	24
SEMESTER IV					
22212AEC41	Functional Analysis	5	1	0	5
22212SEC42	Visual Programming	5	2	0	5
22212AEC43	Number Theory	5	1	0	5
22212DSC44_	Discipline Specific Elective - IV	5	0	0	4

S. Srinivasan

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22212PRW45	Project Work	0	0	0	6
22212PEE	Programme for Exit Examination	0	0	0	2
	Total	20	4	0	27
	Total Credits for the Programme				96

Discipline Specific Electives

Sl. No	Program Code	Program Name	Sub. Code	Sub. Name	Sem
1	22PGMATGE	M.Sc	22212DSC15A	Probability & Statistics	I
2	22PGMATGE	M.Sc	22212DSC15B	Bio-Mathematics	I
3	22PGMATGE	M.Sc	22212DSC15C	Portfolio Optimization	I
4	22PGMATGE	M.Sc	22212DSC15D	Object Oriented Programming Problem in C ++	I
5	22PGMATGE	M.Sc	22212DSC15E	Finite Elements Method	I
6	22PGMATGE	M.Sc	22212DSC15F	Mathematical Finance	I
7	22PGMATGE	M.Sc	22212DSC25A	Econometrics	II
8	22PGMATGE	M.Sc	22212DSC25B	Cryptograph and Network Security	II
9	22PGMATGE	M.Sc	22212DSC25C	Information Security	II
10	22PGMATGE	M.Sc	22212DSC25D	Application of Algebra	II
11	22PGMATGE	M.Sc	22212DSC25E	Computer Graphics	II
12	22PGMATGE	M.Sc	22212DSC25F	Operating System	II
13	22PGMATGE	M.Sc	22212DSC34A	Actuarial Mathematics	III
14	22PGMATGE	M.Sc	22212DSC34B	Applied Statistical Methods	III
15	22PGMATGE	M.Sc	22212DSC34C	Actuarial Models	III
16	22PGMATGE	M.Sc	22212DSC34D	Financial Economics	III
17	22PGMATGE	M.Sc	22212DSC34E	Mathematical Cryptography	III
18	22PGMATGE	M.Sc	22212DSC34F	Time Scale	III
19	22PGMATGE	M.Sc	22212DSC44A	Mathematical Modelling	IV


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20	22PGMATGE	M.Sc	22212DSC44B	Mathematical Ecology	IV
21	22PGMATGE	M.Sc	22212DSC44C	Artificial Intelligence	IV
22	22UPMATGE	M.Sc	22212DSC44D	Design of Algorithms	IV
23	22PGMATGE	M.Sc	22212DSC44E	General Insurance	IV
24	22PGMATGE	M.Sc	22212DSC44F	Game Theory	IV

Open Electives

Semester	Open Elective Courses
III	a) 22211OEC-Writing For the Media b) 22213OEC-Bio-medical Instrumentation c) 22214OEC-Green Chemistry d) 22215OEC-Herbal Medicines e) 22220OEC-M-Marketing f) 22261OEC- Financial Service

Credit Distribution:

Sem	AEC	SEC	DSC	OEC	Research	Others	Total
I	12	04	04	-	01	-	21
II	12	04	04	-	04	-	24
III	10	05	04	03	02	-	24
IV	10	05	04	-	06	02	27
Total	44	18	16	03	13	02	96

Date:

Dr. S. Subramanian

BOS Chairman



H.O.D.

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NEW DISCIPLINE SPECIFIC ELECTIVE COURSES

NEW Course Syllabus

Faculty: BoS

Board: Mathematics

Semester: IV

Course Code	Course Title	L	T	P	C
22212DSC15A	Probability and Statistics				
AIM	This course aims to provide an understanding of the basic concepts in probability, conditional probability and independent events. It will also focus on the random variable, mathematical expectation, and different types of distributions, sampling theory and estimation theory.				
Course Objectives	to design a statistical hypothesis about the real world problem and 2 conduct appropriate test for drawing valid inference about the population characteristics				
	It is inevitable to have the knowledge of hypothesis testing for any research work.				
	The course will provide an opportunity to learn R programming to substantial extent.				
	Apply the basic rules and theorems in probability including Bayes's theorem and the Central Limit Theorem				
Unit No.	Contents				
I	Sample space, probability axioms, real random variables (discrete and continuous), cumulative distribution function, probability mass/density functions, mathematical expectation, moments, moment generating function, characteristic function,				
II	Discrete distributions: uniform, binomial, Poisson, continuous distributions: uniform, normal, exponential.				
III	Joint cumulative distribution function and its properties, joint probability density functions, marginal and conditional distributions, expectation of function of two random variables, conditional expectations, independent random variables, bivariate normal distribution,.				
IV	correlation coefficient, rank correlation coefficient, covariance, linear regression for two variables				



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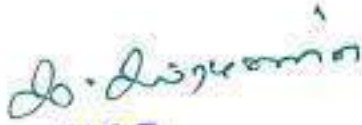
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V	Chebyshev's inequality, statement and interpretation of (weak) law of large numbers, Central Limit theorem for independent and identically distributed random variables with finite variance.
Text Book	1. Robert V. Hogg, Joseph W. McKean and Allen T. Craig, Introduction to Mathematical Statistics, Pearson Education, Asia, 2007
	2. Irwin Miller and Marylees Miller, John E. Freund, Mathematical Statistics with Applications, 7th Ed., Pearson Education, Asia, 2006.
Reference Book	1. Sheldon Ross, Introduction to Probability Models, 9th Ed., Academic Press, Indian Reprint, 2007.
	2. Alexander M. Mood, Franklin A. Graybill and Duane C. Boes, Introduction to the Theory of Statistics, 3rd Ed., Tata McGraw- Hill, Reprint 2007.
Percentage of Syllabus Revised: 100%	


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Course Code	Course Title	L	T	P	C
22212DSC15B	Bio-Mathematics				
AIM	Mathematical biology aims at the mathematical representation and modeling of biological processes, using techniques and tools of applied mathematics				
Course Objectives	To prepares students with a rigorous education in applied mathematics				
	To educates students in the fundamental principles of biology,				
	To trains students to work in a computational arena				
	To better understand how the parts interact and how perturbations in these complex systems may contribute to disease.				
Unit No.	Contents				
I	Mathematical Biology and the modeling process: an overview. Continuous models: Malthus model, logistic growth, Allee effect, Gompertz growth, Michaelis-Menten Kinetics, Holling type growth, Bacterial growth in a Chemostat,				
II	Harvesting a single natural population, Prey predator systems and Lotka Volterra equations, Populations in competitions, Epidemic Models (SI, SIR, SIRS, SIC).				
III	II Activator-Inhibitor system, Insect Outbreak Model: Spruce Budworm, Numerical solution of the models and its graphical representation. Qualitative analysis of continuous models: Steady state solutions, stability and linearization, multiple species communities and Routh-Hurwitz Criteria,				
IV	Phase plane methods and qualitative solutions, bifurcations and limit cycles with examples in the context of biological scenario. (2 questions) Spatial Models: One species model with diffusion, Two species model with diffusion, Conditions for diffusive instability, Spreading colonies of microorganisms, Blood flow in circulatory system, Travelling wave solutions, Spread of genes in a population.				
V	Discrete Models: Overview of difference equations, steady state solution and linear stability analysis, Introduction to Discrete Models, Linear Models, Growth models, Decay models, Drug Delivery Problem, Discrete Prey-Predator models, Density dependent growth models with harvesting, Host-Parasitoid systems (Nicholson-Bailey model), Numerical solution of the models 34 and its graphical representation. Case Studies: Optimal Exploitation models, Models in				

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	Genetics, Stage Structure Models, Age Structure Models
Text Book	1. L.E. Keshet, Mathematical Models in Biology, SIAM, 1988.
	2. J. D. Murray, Mathematical Biology, Springer, 1993
Reference Book	3.Y.C. Fung, Biomechanics, Springer-Verlag, 1990.
	4. F. Brauer, P.V.D. Driessche and J. Wu, Mathematical Epidemiology, Springer, 2008. 5. M. Kot, Elements of Mathematical Ecology, Cambridge University Press, 2001.
Percentage of Syllabus Revised: 100%	

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Course Code	Course Title	L	T	P	C
22212D5C15C	Portfolio optimization				
AIM	to maximize portfolio returns and minimize portfolio risk				
Course Objectives	The objective typically maximizes factors such as expected return, and minimizes costs like financial risk, resulting in a multi-objective optimization problem.				
	Factors being considered may range from tangible (such as assets, liabilities, earnings or other fundamentals)				
Unit No.	Contents				
I	Hydrostatics, Mass, Density, Specific gravity (relative density) Fluid-Pressure under Gravity : Solid, Fluid, Liquid, Gases, Perfect fluids, Viscous fluid, Experimental observation about fluid pressure under gravity, Liquid exerts pressure normally on a plane in contact (An Analytical treatment),				
II	Equality of pressure in all directions, Transmissibility of fluid pressure, In a fluid at rest under gravity the pressure is same at all points in the same horizontal plane, Find the pressure at a point of a liquid or establish pressure equation for a fluid at rest under gravity, Free surface and effective surface of a liquid, Common surface of two heavy homogenous liquids that don't mix is a horizontal plane.				
III	Thrust on Curved Surfaces: Thrust on curved surfaces, vertical surfaces, Horizontal thrust. Equilibrium of fluids under given field of forces and Pressure of Elastic rotating fluids.				
IV	Equilibrium of floating bodies. Archimedes' Principle, Force of Buoyancy, Centre of Buoyancy and Plane floatation, Body floats freely in one or more liquids, Body floating in a liquid under constraints.				
V	Condition of equilibrium of a body immersed in a liquid and supported by a string, Weighing a body in air, Weighing a body immersed in a liquid, The positions of equilibrium of a body floating in a homogenous liquid.				
Text Book	1. B. D. Sharma and M. R. Hassan, "Hydrostatics", Kedar Nath Ram Nath, Meerut, 2018.				
Reference Book	1. S.L.Loni, "An Introduction to Hydrostatics"				
Percentage of Syllabus Revised: 100%					

S. S. Srinivasan

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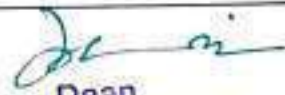
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Course Code	Course Title	L	T	P	C
22212DSC15D	Oriented Programming in C++				
AIM	aims to implement real-world entities like inheritance, hiding, polymorphism, etc. in programming				
Course Objectives	To bind together the data and the functions that operate on them so that no other part of the code can access this data except that function.				
Unit No.	Contents				
I	OOP Paradigm: Comparison of Programming paradigms, Characteristics of Object-Oriented Programming Languages, Object-based programming languages C++: Brief History of C++, Structure of a C++ program, Difference between C and C++ - cin, cout, new, delete operators, ANSI/ISO Standard C++, Comments, Working with Variables and const Qualifiers. Enumeration, Arrays and Pointer. (2 questions)				
II	Implementing oops concepts in C++ Objects, Classes, Encapsulation, Data Abstraction, Inheritance, Polymorphism, Dynamic Binding, Message Passing, Default Parameter Value, Using Reference variables with Functions. (2 questions)				
III	Abstract data types, Class Component, Object & Class, Constructors Default and Copy Constructor, Assignment operator deep and shallow coping, Access modifiers – private, public and protected. Implementing Class Functions within Class declaration or outside the Class declaration. instantiation of objects,				
IV	Scope resolution operator, Working with Friend Functions, Using Static Class members. Understanding Compile Time Polymorphism function overloading Rules of Operator Overloading (Unary and Binary) as member function/friend function,				
V	Implementation of operator overloading of Arithmetic Operators, Overloading Output/Input, Prefix/ Postfix Increment and decrement Operators, Overloading comparison operators, Assignment, subscript and function call Operator , concepts of namespaces.				
Text Book	1. A. R. Venugopal, Rajkumar, and T. Ravishanker, Mastering C++, TMH, 1997. 2. S. B. Lippman and J. Lajoie, C++ Primer, 3rd Ed., Addison Wesley, 2000.				
Reference Book	1. Bruce Eckel, Thinking in C++, 2nd Ed., President, Mindview Inc., Prentice Hall.				



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| | <p>2. D. Parasons, Object Oriented Programming with C++, BPB Publication.</p> <p>3. Bjarne Stroustrup , The C++ Programming Language, 3rd Ed., Addison Welsley</p> |
| <p>Percentage of Syllabus Revised: 100%</p> | |

D. Suganin

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Course Code	Course Title	L	T	P	C
22212DSC15E	Finite Element Methods				
AIM	for numerically solving differential equations arising in engineering and mathematical modelling.				
Course Objectives	Typical problem areas of interest include the traditional fields of structural analysis, heat transfer, fluid flow, mass transport, and electromagnetic potential.				
Unit No.	Contents				
I	Introduction to finite element methods, comparison with finite difference methods, Methods of weighted residuals, collocations, least squares				
II	Applications to solving simple problems of ordinary differential equations. Linear, quadratic and higher order elements in one dimensional and assembly, solution of assembled system.				
III	Simplex elements in two and three dimensions, quadratic triangular elements, rectangular elements, serendipity elements and isoperimetric elements and their assembly				
IV	Discretization with curved boundaries. Interpolation functions, numerical integration				
V	Solution of one dimensional heat and wave equation and solution of two dimensional Laplace equation under different Geometric conditions.				
Text Book	1. J.N. Reddy, Introduction to the Finite Element Methods, Tata McGraw-Hill, 2003. 2. K.J. Bathe, Finite Element Procedures, Prentice-Hall, 2001				
Reference Book	1. R.D. Cook, D.S. Malkus and M.E. Plesha, Concepts and Applications of Finite Element Analysis, John Wiley and Sons, 2002. 2. Thomas J.R. Hughes, The Finite Element Method: Linear Static and Dynamic Finite Element Analysis, Dover Publication, 2000.				
Percentage of Syllabus Revised: 100%					

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Course Code	Course Title	L	T	P	C
22212DSC15F	Mathematical Finance				
AIM	It helps researchers to analyze, quantify, and optimize financial decisions				
Course Objectives	By employing mathematical models, statistical analysis, and computational techniques, financial professionals can gain valuable insights into market behavior, risk management, asset pricing, and portfolio optimization				
Unit No.	Contents				
I	Basic principles: Comparison, arbitrage and risk aversion, Interest (simple and compound, discrete and continuous), time value of money,				
II	inflation, net present value, internal rate of return (calculation by bisection and Newton-Raphson methods), comparison of NPV and IRR. Bonds, bond prices and yields,				
III	Macaulay and modified duration, term structure of interest rates: spot and forward rates, explanations of term structure, running present value, floating-rate bonds, immunization, convexity, puttable and callable bonds.				
IV	Asset return, short selling, portfolio return, (brief introduction to expectation, variance, covariance and correlation), random returns, portfolio mean return and variance, diversification, portfolio diagram, feasible set, Markowitz model (review of Lagrange multipliers for 1 and 2 constraints),				
V	Two fund theorem, risk free assets, One fund theorem, capital market line, Sharpe index. Capital Asset Pricing Model (CAPM), betas of stocks and portfolios, security market line, use of CAPM in investment analysis and as a pricing formula, Jensen's index.				
Text Book	1. David G. Luenberger, Investment Science, Oxford University Press, Delhi, 1998.				
Reference Book	1. John C. Hull, Options, Futures and Other Derivatives, 6th Ed., Prentice-Hall India, Indian reprint, 2006. 2. Sheldon Ross, An Elementary Introduction to Mathematical Finance, 2nd Ed., Cambridge University Press, USA, 2003.				
Percentage of Syllabus Revised: 100%					

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Course Code	Course Title	L	T	P	C
22212DSC25A	Econometrics				
AIM	To convert qualitative statements (such as "the relationship between two or more variables is positive") into quantitative statements				
Course Objectives	"consumption expenditure increases by 95 cents for every one dollar increase in disposable income"				
Unit No.	Contents				
I	Statistical Concepts Normal distribution; chi-square, t and F-distributions; estimation of parameters; properties of estimators; testing of hypotheses; defining statistical hypotheses;				
II	distributions of test statistics; testing hypotheses related to population parameters; Type I and Type II errors; power of a test; tests for comparing parameters from two samples.				
III	Simple Linear Regression Model: Two Variable Case Estimation of model by method of ordinary least squares				
IV	Properties of estimators; goodness of fit; tests of hypotheses; scaling and units of measurement; confidence intervals; Gauss-Markov theorem; forecasting.				
V	Assumptions: Consequences, Detection and Remedies Multicollinearity; heteroscedasticity; serial correlation. (1 question) Specification Analysis Omission of a relevant variable; inclusion of irrelevant variable; tests of specification errors.				
Text Book	1. Jay L. Devore, Probability and Statistics for Engineers, Cengage Learning, 2010. 2. John E. Freund, Mathematical Statistics, Prentice Hall, 1992.				
Reference Book	1. Richard J. Larsen and Morris L. Marx, An Introduction to Mathematical Statistics and its Applications, Prentice Hall, 2011. 2. D. N. Gujarati and D.C. Porter, Essentials of Econometrics, McGraw Hill, 4th Ed., International Edition, 2009.				
Percentage of Syllabus Revised: 100%					



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Course Code	Course Title	L	T	P	C
22212DSC25B	Cryptography and Network Security				
AIM	To understand basics of Cryptography and Network Security				
Objectives	To be able to secure a message over insecure channel by various means.				
	To learn about how to maintain the Confidentiality, Integrity and Availability of a data.				
	To understand various protocols for network security to protect against the threats in the networks				
Unit No.	Contents				
I	Public Key Cryptography Principles & Applications, Algorithms: RSA, Message Authentication.				
II	: One way Hash Functions: Message Digest, MD5, SHA1. Public Key Infrastructure: Digital Signatures, Digital Certificates, Certificate Authorities				
III	Network Attacks: Buffer Overflow, IP Spoofing, TCP Session Hijacking, Sequence Guessing, Network Scanning: ICMP, TCP sweeps, Basic Port Scans; Denial of Service Attacks: SYN Flood, Teardrop attacks, land, Smurf Attacks. IP security Architecture: Overview,				
IV	Authentication header, Encapsulating Security Pay Load, combining Security Associations, Key Management. Virtual Private Network Technology: Tunneling using IPSEC				
V	Requirements, Secure Socket Layer, and Secure Electronic Transactions, Network Management Security: Overview of SNMP Architecture- SNMPV1, SNMPV3. Firewall Characteristics & Design Principles, Types of Firewalls: Packet Filtering Router, Application Level Gateway or Proxy, Content Filters, Bastion Host.				
Text Book	1. W. Stallings, Networks Security Essentials: Application & Standards, Pearson Education, 2000..				
Reference Book	1. TCP/IP Protocol Suite , Behrouz A. Forouzan, Data Communication and Networking, Tata McGraw Hill. 2.W. Stallings, Cryptography and Network Security, Principles and Practice, Pearson Education, 2000				
Percentage of Syllabus Revised: 100%					

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Course Code	Course Title	L	T	P	C
22212DSC25C	Information Security				
AIM	The main aim of Information Security are typically related to ensuring confidentiality, integrity, and availability of company information.				
Course Objectives	To study of protection of confidentiality, integrity, availability, authenticity, and non-repudiation of user data.				
Unit No.	Contents				
I	Overview of Security: Protection versus security; aspects of security–data integrity, data availability, privacy; security problems, user authentication, Orange Book.				
II	Security Threats: Program threats, worms, viruses, Trojan horse, trap door, stack and buffer over flow; system threats- intruders; communication threats- tapping and piracy.				
III	Cryptography: Substitution, transposition ciphers, symmetric-key algorithms- Data Encryption Standard, advanced encryption standards, public key encryption - RSA;				
IV	Diffie- Hellman key exchange, ECC cryptography, Message Authentication- MAC, hash functions.				
V	Digital signatures: Symmetric key signatures, public key signatures, message digests, public key infrastructures. (1 questions) Security Mechanisms: Intrusion detection, auditing and logging, tripwire, system-call monitoring.				
Text Book	1. W. Stallings, Cryptography and Network Security Principles and Practices, 4th Ed., PrenticeHall of India, 2006. 2. C. Pfleeger and S.L. Pfleeger, Security in Computing , 3rd Ed., Prentice-Hall of India, 2007. 3. D. Gollmann, Computer Security, John Wiley and Sons, NY, 2002.				
Reference Book	1. J. Piwprzyk, T. Hardjono and J. Seberry, Fundamentals of Computer Security, SpringerVerlag Berlin, 2003. 2. J.M. Kizza, Computer Network Security, Springer, 2007. 3. M. Merkow and J. Breithaupt, Information Security: Principles and Practices, Pearson Education, 2006.				
Percentage of Syllabus Revised: 100%					


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Course Code	Course Title	L	T	P	C
22212DSC25D	Applications of Algebra				
AIM	to simplify the process of articulating a mathematical relationship by efficiently utilising symbols to represent entities as a form of abbreviation				
Course Objectives	Translate data to algebraic expressions the prime factorization of expressions				
	Translate data to equations				
	Use commutative, associative and distributive laws to rewrite expression				
	Determine the prime factorization of expressions				
Unit No.	Contents				
I	Balanced incomplete block designs (BIBD): definitions and results, incidence matrix of a BIBD, construction of BIBD from difference sets, construction of BIBD using quadratic residues, difference set families, construction of BIBD from finite fields				
II	Coding Theory: introduction to error correcting codes, linear codes, generator and parity check matrices, minimum distance. (1 questions) Symmetry groups and color patterns: review of permutation groups, groups of symmetry and action of a group on a set; colouring and colouring patterns				
III	Special types of matrices: idempotent, nilpotent, involution, and projection triangular matrices, circulant matrices, Vandermonde matrices, Hadamard matrices, permutation and doubly stochastic matrices, Frobenius- König theorem, Birkhoff theorem. Positive				
IV	Semi-definite matrices: positive semi-definite matrices, square root of a positive semi-definite matrix, a pair of positive semi-definite matrices, and their simultaneous diagonalization. Symmetric matrices and quadratic forms: diagonalization of symmetric matrices, quadratic forms, constrained optimization, singular value decomposition, and applications to image processing and statistics. (2 questions)				
V	Applications of linear transformations: Fibonacci numbers, incidence models, and differential equations. Least squares methods: Approximate solutions of system of linear equations, approximate inverse of an $m \times n$ matrix, solving a matrix equation using its normal equation, finding functions that approximate data. Linear algorithms: LDU factorization, the row reduction algorithm and its inverse, backward and forward substitution, approximate inverse and				



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	projection algorithms.
Text Book	1. I. N. Herstein and D. J. Winter, Primer on Linear Algebra, Macmillan Publishing Company, New York, 1990. 2. S. R. Nagpaul and S. K. Jain, Topics in Applied Abstract Algebra, Thomson Brooks and Cole, Belmont, 2005.
Reference Book	1. Richard E. Klima, Neil Sigmon, Ernest Stitzinger, Applications of Abstract Algebra with Maple, CRC Press LLC, Boca Raton, 2000. 2. David C. Lay, Linear Algebra and its Applications. 3rd Ed., Pearson Education Asia, Indian Reprint, 2007.
Percentage of Syllabus Revised: 100%	



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Course Code	Course Title	L	T	P	C
22212DSC25E	Computer Graphics				
AIM	for displaying art and image data effectively and meaningfully to the consumer				
Course Objectives	The main objective of the course is to introduce students with fundamental concepts and theory of computer graphics.				
	It presents the important drawing algorithm, polygon fitting, clipping and 2D transformation curves and an introduction to 3D transformation				
Unit No.	Contents				
I	Development of computer Graphics: Raster Scan and Random Scan graphics storages, displays processors and character generators, colour display techniques, interactive input/output devices.				
II	Points, lines and curves: Scan conversion, line-drawing algorithms, circle and ellipse generation,				
III	Conic-section generation, polygon filling anti aliasing				
IV	Two-dimensional viewing: Coordinate systems				
V	Linear transformations, line and polygon clipping algorithms				
Text Book	1. D. Hearn and M.P. Baker, Computer Graphics, 2nd Ed., Prentice–Hall of India, 2004. 2. J.D. Foley, A van Dam, S.K. Feiner and J.F. Hughes, Computer Graphics: Principals and Practices, 2nd Ed., Addison-Wesley, MA, 1990.				
Reference Book	1. D.F. Rogers, Procedural Elements in Computer Graphics, 2nd Ed., McGraw Hill Book Company, 2001. 2. D.F. Rogers and A.J. Admas, Mathematical Elements in Computer Graphics, 2nd Ed., McGraw Hill Book Company, 1990.				
Percentage of Syllabus Revised: 100%					



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Course Code	Course Title	L	T	P	C
22212D5C25F	Operating System: Linux				
AIM	It maintains the privacy of the user. The performance of the Linux system is much higher than other operating systems.				
Course Objectives	To study Efficiency, Hardware, abstraction, Convenience System resource management.				
Unit No.	Contents				
I	Linux – The Operating System: Linux history, Linux features, Linux distributions, Linux's relationship to Unix,				
II	Overview of Linux architecture, Installation, Start up scripts, system processes (an overview), Linux Security.				
III	The Ext2 and Ext3 File systems: General Characteristics of, The Ext3 File system, file permissions. User Management:				
IV	Types of users, the powers of Root, managing users (adding and deleting): using the command line and GUI tools.				
V	Resource Management in Linux: file and directory management, system calls for files Process Management, Signals, IPC: Pipes, FIFOs, System V IPC, Message Queues, system calls for processes, Memory Management, library and system calls for memory.				
Text Book	1. Arnold Robbins, Linux Programming by Examples The Fundamentals, 2nd Ed., Pearson Education, 2008. 2. Cox K, Red Hat Linux Administrator's Guide, PHI, 2009. 3. R. Stevens, UNIX Network Programming, 3rd Ed., PHI, 2008.				
Reference Book	1. Sumitabha Das, Unix Concepts and Applications, 4th Ed., TMH, 2009. 2. Ellen Siever, Stephen Figgins, Robert Love, Arnold Robbins, Linux in a Nutshell, 6th Ed., O'Reilly Media, 2009. 3. Neil Matthew, Richard Stones, Alan Cox, Beginning Linux Programming, 3rd Ed., 2004.				
Percentage of Syllabus Revised: 100%					

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Course Code	Course Title	L	T	P	C
22212DSC34A	Acturial Mathematics				
AIM	The aim of the Actuarial Mathematics subject is to provide a grounding in financial mathematics and its simple applications				
Course Objectives	(i) Describe how to use a generalised cashflow model to describe financial transactions.				
	(ii) Describe how to take into account the time value of money using the concepts of compound interest and discounting.				
	(iii) Show how interest rates or discount rates may be expressed in terms of different time periods.				
	(iv) Demonstrate a knowledge and understanding of real and money interest rates.				
	(v) Calculate the present value and the accumulated value of a stream of equal or unequal payments using specified rates of interest and the net present value at a real rate of interest, assuming a constant rate of inflation				
Unit No.	Contents				
I	Cashflow models, The time value of money, Interest rates, Real and money interest rates, Discounting and accumulating, Level annuities.				
II	Equations of value, Loan schedules, Project appraisal				
III	Investments, Elementary compound interest problems,				
IV	Term structure of interest rates, Stochastic interest rate models				
V	Arbitrage and forward contracts, Deferred and increasing annuities,				
Text Book	An introduction to the mathematics of finance. McCutcheon, J. J.; Scott, W. F. Heinemann, 1986. 463 pages. ISBN: 9780434912285. (Chapters 1 to 7 and Chapter 10)				
Reference Book	1. Bowers, N. L.; Gerber, H. U.; Hickman, J. C. et al., In Actuarial mathematics, 2nd ed. Society of Actuaries, 1997. 753 pages. ISBN: 9780938959465. 2. Butcher, M. V., Mathematics of compound interest, Nesbitt, C. J. Ulrich's Books, 1971. 324 pages. ISBN: 9780960300013. 3. Ingersoll, J. E. Rowman & Littlefield, 1987, Theory of financial decision making. 474 pages. ISBN: 9780847673599.				
Percentage of Syllabus Revised: 100%					



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Course Code	Course Title	L	T	P	C
22212DSC34B	Applied Statistical Methods				
AIM	The aim of the Statistical Methods subject is to provide a further grounding in mathematical and statistical techniques of particular relevance to financial work.				
Course Objectives	(i) Explain the concepts of decision theory and apply them.				
	(ii) Calculate probabilities and moments of loss distributions both with and without limits and risk-sharing arrangements.				
	(iii) Construct risk models involving frequency and severity distributions and calculate the moment generating function and the moments for the risk models both with and without simple reinsurance arrangements.				
	(iv) Explain the concept of ruin for a risk model. Calculate the adjustment coefficient and state Lundberg's inequality. Describe the effect on the probability of ruin of changing parameter values and of simple reinsurance arrangements.				
	(v) Explain the fundamental concepts of Bayesian statistics and use these concepts to calculate Bayesian estimators				
Unit No.					
I	Decision theory, Bayesian statistics, Loss distributions, Reinsurance				
II	Credibility theory, Empirical Bayes credibility theory, Risk models - Collective Risk Model, Risk models - Individual Risk Model				
III	Ruin theory, Generalised linear models, Run-off triangles.				
IV	Time series - Auto Regressive models, Time series -				
V	ARCH, GARCH models, Monte Carlo simulation.				
Text Book	Loss models: from data to decisions. - Klugman, Stuart A; Panjer, Harry H; Willmot, Gordon E; Venter, Gary G. - John Wiley & Sons, 1998. 644 pages. ISBN: 0 471 23884 8. (Chapters 5 and 6, Chapters 9 to 11, Chapters 15, Chapters 20 and 21)				
Reference Book	1. Dobson, Annette J., An introduction to statistical modelling, - Chapman & Hall, 1983. 125 pages. ISBN: 0 412 24860 3. 2. Hossack, Ian B, Pollard, John H, Zehnwirth, Benjamin, Introductory statistics with applications in general insurance, - 2nd ed. - Cambridge University Press, 1999 - 282 pages. ISBN: 0 521 65534 X. 3. Daykin, Chris D; Pentikainen, Teivo; Pesonen, Martti, Practical risk theory for actuaries, Chapman & Hall, 1994. 545 pages. - ISBN: 0 412 42850 .				
Percentage of Syllabus Revised: 100%					

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Course Code	Course Title	L	T	P	C
22212DSC34C	Acturial Models				
AIM	The aim of the Models subject is to provide a grounding in stochastic processes and survival models and their application.				
Course Objectives	(i) Describe the principles of actuarial modelling.				
	(ii) Describe the general principles of stochastic processes, and their classification into different types.				
	(iii) Define and apply a Markov chain				
	(iv) Explain the concept of survival models.				
	(v) Describe estimation procedures for lifetime distributions				
Unit No.					
I	Principles of actuarial modeling, stochastic processes, Markov chains, The two-state Markov model.				
II	Time-homogeneous Markov jump processes, Time-inhomogeneous Markov jump processes				
III	Survival models, Estimating the lifetime distribution function, The Cox regression model				
IV	The Binomial and Poisson models, Exposed to risk.				
V	Graduation and statistical tests, Methods of graduation.				
Text Book	1)Kulkarni, Vidyadhar G, Modeling, analysis, design, and control of stochastic systems, Springer, 1999. 374 pages. – ISBN: 0 387 98725 8. (Chapters 1, 2, 4 and 5) 2)Elandt-Johnson, Regina C; Johnson, Norman L, Survival models and data analysis, John Wiley & Sons, 1999, 457 pages. – ISBN: 0 47134992 5. (Chapters 2 Sec 2.10, 3, 4 and 6)				
Reference Book	1. Macdonald A S, <i>An Actuarial Survey of Statistical Models for Decrement and Transition Data</i> , British Actuarial Journal 2 (1996). 2. Brzezniak, Zdzislaw; Zastawniak, Tomasz, Basic stochastic processes; A course through exercises – Springer, 1998. - 225 pages. – ISBN: 3 540 76175 6.				
Percentage of Syllabus Revised: 100%					



H.O.D.

DEPARTMENT OF MATHEMATICS
PRIST DEEMED TO BE UNIVERSITY
THANJAVUR - 613 403



Dean

School of Arts & Science
Ponnaiyah Ramalingam Institute of
Science & Technology (PRIST)
Deemed to be University
Valarur, Tamil Nadu

Course Code	Course Title	L	T	P	C
22212D5C34D	Financial Economics				
AIM	The aim of the Financial Economics subject is to develop the necessary skills to construct asset liability models and to value financial derivatives. These skills are also required to communicate with other financial professionals and to critically evaluate modern financial theories				
Course Objectives	(i) Describe and discuss the application of utility theory to economic and financial problems.				
	(ii) Discuss the advantages and disadvantages of different measures of investment risk.				
	(iii) Describe and discuss the assumptions of mean-variance portfolio theory and its principal results.				
	(iv) Describe and discuss the properties of single and multifactor models of asset returns.				
	(v) Describe asset pricing models, discussing the principal results and assumptions and limitations of such models.				
Unit No.					
I	Introduction – Efficient Market Hypothesis, Risk Assessment Introduction to financial economics, Efficient Market Hypothesis (EMH), Evidence for and against EMH, Utility theory, stochastic dominance and behavioral finance, Measures of investment risk, Portfolio theory, Models of asset returns				
II	Determination of Efficient Frontier using Statistical and Economic Pricing Models Asset pricing models, Brownian motion and martingales, stochastic calculus and Ito processes, stochastic models of security prices				
III	Introduction to Stochastic Models Introduction to the valuation of derivative securities, The Greeks, The binomial model, The Black-Scholes option pricing formula				
IV	Properties and Valuation of Derivatives The 5-Step method in discrete time, The 5-step method in continuous time, Term Structure of interest Rates,				
V	Credit Risk Models: JLT Model, Two State Model.				
Text Book	I. Elton, Edwin J, Martin J Gruber, Stephen J Brown, & William N Goetzmann, Modern portfolio theory and investment analysis (6th edition), John Wiley, 2003 (Chapters: 1, 4, 5,6, 13, 17, 20)				

Dr. Desquonnis

H.O.D.

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Dean

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Ponnalyah Ramalayam Institute of
Sciences & Technology (PRIST)

	2.Hull, John C, Options, Futures and other derivatives (5th edition), Prentice Hall, 2002. (Chapters: 1, 12, 13, 14, 18, 20, 23, 30)
Reference Book	1. Baxter, Martin & Andrew Rennie, Financial calculus; An introduction to derivative pricing, Cambridge University Press, 1996. 2. Panjer, Harry H (ed), Financial economics: with applications to investments, insurance and pensions, The Actuarial Foundation, 1998.
Percentage of Syllabus Revised: 100%	

S. Srinivasan

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J. Srinivasan

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School of Arts & Science
Ponnaiyah Ramalayan Institute of
Science & Technology (PRIST)
Deemed to be University
Vallam, Thanjavur - 613 403

Course Code	Course Title	L	T	P	C
22212DSC34E	Mathematical Cryptography				
AIM	To offer number theoretic preliminaries for widely used public-key cryptosystems. 2. To teach public-key cryptographic primitives and their role in communication.				
Course Objectives	1. Appreciate the role of mathematics in cryptography.				
	2. Understand how secure communications happen over insecure channels.				
	3. Appreciate how computational complexities form the basis of public-key cryptography.				
	4. Understand the importance of data secrecy, data integrity, and data authentication and the ways to achieve them				
	5. Understand key-agreement, public-key encryption and digital signatures				
Unit No.					
I	Simple substitution ciphers-Divisibility and GCD(without proofs) – Modular arithmetic- Prime numbers, unique factorization and finite fields-Powers and primitive roots in finite fields				
II	The birth of public key cryptography- Discrete Logarithm Problem-Diffie-Hellman key exchange- ElGamal public key cryptosystem-The Chinese remainder theorem.				
III	Euler's formula and roots modulo pq – RSA public key cryptosystem- Implementations and security issues-Primality testing-Pollard's $p-1$ factorization algorithm- Quadratic residues and Quadratic reciprocity- Probabilistic encryption				
IV	Elliptic Curves(Theorems without proofs)- Elliptic Curves over finite fields- Elliptic Curve Discrete Logarithm Problem-Elliptic Curve Cryptography and Lenstra's ECFM.				
V	Digital Signatures – An Over View and Definitions-RSA Digital Signatures				
Text Book	KEY TEXT BOOK: An Introduction to Mathematical Cryptography , Authors : Jeffrey Hoffstein, Jill Pipher and Joseph H. Silverman, ISBN : 978-1-4419-2674-6, Springer, 2010. Chapters: 1.1-1.5, 2.1-2.4, 2.8, 3.1-3.5 (excluding 3.4.1 & 3.4.2), 3.9-3.10, 5.1-5.4,5.6, 7.1-7.2.				
Reference Book	Neal Koblitz, A Course in Number Theory and Cryptography, Springer, 1994. Jonathan Katz and Yehuda Lindell, Introduction to Modern Cryptography, Second edition, CRC Press, 2015. Douglas R.Stinson, Cryptography Theory and Practice, CRC Press, Third edition, 2005				
Percentage of Syllabus Revised: 100%					

S. S. Srinivasan

H.O.D.

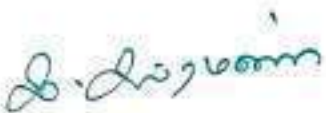
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THANJAVUR - 613 403

J. Srinivasan

Dean


School of Arts & Science
Ponnalyah Ramkrishnan Institute of
Science & Technology (PRIST)
Deemed to be University
Vallam, Thanjavur - 613 403.

Course Code	Course Title	L	T	P	C
22212DSC34F	Time Scale				
AIM	The objectives of the course are to know what Time Scales are, to study basic analysis on Time scales, and solve dynamic equations of various types including Self Adjoint equations and Riccati equations on time scales				
Course Objectives	After going through the course, a student should be able to perform calculus-based study on Time Scales and Solve Dynamic Equations based on Green's function.				
Unit No.					
I	Time scale calculus – First order linear equations on time scale				
II	Hilger's complex plane – Initial value problems				
III	Second order linear equations on time scale – hyperbolic and trigonometric functions – Euler –Cauchy equations- Laplace transforms				
IV	Self-Adjoint equations				
V	Riccati equation, Boundary value problems and Green's function–Eigenvalue problems				
Text Book	1.Martin Bohner and Allan Peterson, Dynamic Equations on Time Scales an introduction with applications, BIRKHAUSER BOSTON. BASEL. BERLIN, 2001, [Chapters: 1 to 4].				
Percentage of Syllabus Revised: 100%					


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 School of Arts & Science
 Ponnalyah Ramalayam Institute of
 Science & Technology (PRIST)
 Deemed to be University
 Vallam, Thanjavur - 613 403.

Course Code	Course Title	L	T	P	C
22212DSC44A	Game Theory				
AIM	Provide a foundation in the basic concepts of Game Theory Understand Nash's equilibrium Understand Cooperative v/s Non-Cooperative games				
Course Objectives	Clear of how to strategize in day to day situations				
	Take decisions which benefit as many as possible				
	Model all practical situations as a game and find its solution				
	When to form coalitions and not.				
Unit No.					
I	Games and Solutions, Game theory and the Theory of Competitive Equilibrium, Rational Behaviour, The Steady State and Deductive Interpretations, Bounded Rationality, Terminology and Notation				
II	Strategic Games, Nash Equilibrium, Existence of a Nash Equilibrium, Strictly Competitive Games, Bayesian Games: Strategic Games with Imperfect Information.				
III	Mixed, Correlated, and Evolutionary Equilibrium Mixed Strategy Nash Equilibrium, Interpretations of Mixed Strategy Nash Equilibrium, Correlated Equilibrium, Evolutionary Equilibrium				
IV	Rationalizability, Iterated Elimination of Dominated Actions Rationalizability, Iterated Elimination of Strictly Dominated Actions, Iterated Elimination of Weakly Dominated Actions				
V	Knowledge and Equilibrium A Model of Knowledge, Common Knowledge, Can People Agree to Disagree, Knowledge and Solution Concepts, The Electronic Mail Game				
Text Book	Martin J Osborne and Ariel Rubinstein, A Course in Game Theory, The MIT Press, Cambridge Massachusetts, London.				
Reference Book	N.N. Vorobev, Game Theory, Springer Verlag Publications, 1977				
Percentage of Syllabus Revised: 100%					


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 Science & Technology (PRIST)
 Dindurthi University
 Vellore, Tamil Nadu - 619 022

Course Code	Course Title	L	T	P	C
22212DSC44B	Mathematical Ecology				
AIM	To Introduce Mathematical Modelling of population dynamics under various conditions. To analyse mathematical models using the theory of Linear and Non-Linear Dynamical Systems				
Course Objectives	Apply theory of Non-Linear Dynamical Systems and theory of Bifurcations to analyse the dynamics of the model and determine the futuristic population of species in an ecosystem.				
	Comprehensively understand Predator-Prey models, their analysis and dynamics for a 2-dimensional system.				
Unit No.					
I	Single-species models Exponential, Logistic and Gompertz Growth, arvest Models: Bifurcation and Break Points				
II	Interacting populations A Classical Prey-Predator model, To cycle or not to cycle,				
III	Global Bifurcations in Prey-Predator Models,				
IV	Competition Models,.				
V	Mutualism Models.				
Text Book	Mark Kot, Elements of Mathematical Ecology, Cambridge University press, 2001. [Chapters: I. A: Sec 1, 2, I.B: 7, 8, 9, 12, 13]				
Reference Book	J. D. Murray, Mathematical Biology: An Introduction, 3rd edition, Springer, 2001.				
Percentage of Syllabus Revised: 100%					


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School of Arts & Science
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Science & Technology (PRIST)
Deemed to be University
Vellore, Tamil Nadu - 613 403.

Course Code	Course Title	L	T	P	C
22212D5C44C	Artificial Intelligence				
AIM	The course introduces to students the concepts and principles behind mapping Human Intelligence onto Artificial Systems. It is Primarily the study of agents different types of Intelligent agents, Search Techniques, Heuristics based, State Space Search for Problem Solving. It is followed by Inferencing, Logical Reasoning Approaches and Knowledge representation applicable to real world problems and situations				
Course Objectives	Understand the concepts of Artificial Intelligence State Space Search and Problem Solving				
	Work on Uninformed and Informed Search Techniques				
	Solve various types of real world problems and use theory in simulations.				
	Construct Logical Statements from Natural Language Sentences and create a Facts base and deduce new facts by the application of reasoning procedures				
	Apply techniques of Knowledge representation to solve real world problems				
Unit No.					
I	Introduction – what is AI? – Intelligent agents, environments – Solving problems by searching: problem solving agents –Example problems – Uninformed search strategies – Informed search and exploration: Informed search strategies –Heuristic functions– Local search algorithms – Optimization problems				
II	Logical Agents: Knowledge Based Agents – Logic – Propositional logic – Reasoning patterns – Propositional Inference – Agents based on propositional logic – First Order Logic :Representation–Using FOL–Knowledge Engineering–Inference in FOL : Unification And Lifting – Forward Chaining – Backward Chaining – Resolution – Examples				
III	Knowledge Representation: Ontological Engineering – Categories and objects – Actions situations and events – Mental events and mental objects – Reasoning Systems – Truth maintenance systems				
IV	Learning from Observations: Forms of learning – Inductive learning – Learning Decision trees - Knowledge in Learning				
V	– Knowledge in Learning – Explanation based learning – Learning using relevance information				
Text Book	1. Stuart J. Russel and Peter Norvig, Artificial Intelligence – A Modern Approach, Prentice Hall, Pearson Education, 2003. [Chapters & Sections : 1: 1.1 ; 2: 2.1 to 2.4 ; 3:3.1 to 3.6; 4: 4.1 to 4.3 ; 7: 7.1 to 7.7; 8 : 8.1 to 8.4; 9: 9.1 to 9.5 ; 10: 10.1 to 10.8; 18: 18.1 to 18.3 ; 19: 19.1 to 19.4]				
Reference Book	1. George F. Luger and William A. Stubblefield, Artificial Intelligence, Structures and Strategies for Complex Problem Solving, The Benjamin / Cummings Publishing Co, 1993. 2. Amit Konar, Artificial Intelligence and Soft Computing, CRC Press, 2000.				
Percentage of Syllabus Revised: 100%					


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 DEPARTMENT OF MATHEMATICS
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 THALAIYAR - 613 403


Dean
 School of Arts & Science
 Ponnaiyah Ramalingam Institute of
 Science & Technology (PRIST)
 Dindur - 627 010

Course Code	Course Title	L	T	P	C
22212DSC44D	Design of Algorithms				
AIM	The course takes a mathematical problem solving approach to writing algorithms. The course deals with designing algorithms through the process of induction and simultaneously prove its correctness. A variety of domains such as sequences, sets, graphs and geometric are discussed.				
Course Objectives	1. Student will be able to design and develop an algorithm using the induction processes.				
	2. Student can prove the correctness of an algorithm.				
	3. Student becomes a better problem solver.				
Unit No.					
I	Design of Algorithms by Induction				
II	Algorithms involving Sequences and Sets				
III	Graph Algorithms .				
IV	Geometric Algorithms				
V	Algebraic and Numeric Algorithms				
Text Book	Udi Manber, Introduction to Algorithms: A Creative Approach, Addison-Wesley, 1988, Chapters: 5 to 9.				
Percentage of Syllabus Revised: 100%					

S. Jaganmouli

H.O.D.

DEPARTMENT OF MATHEMATICS
PRIST DEEMED TO BE UNIVERSITY
TRICHY - 613 003

S. Jaganmouli

SCHOOL OF DISTANCE EDUCATION
PONDICHERRY UNIVERSITY
SCHOOL OF DISTANCE EDUCATION
DEPARTMENT OF MATHEMATICS
VALLUVAR NAGAR, CHENNAI - 605 006

Course Code	Course Title	L	T	P	C
22212DSC44E	General Insurance, Life and Health Contingencies				
AIM	The aim of the Contingencies subject is to provide a grounding in the mathematical techniques that can be used to model and value cash-flows dependent on death, survival, or other uncertain risks.				
Course Objectives	(i) Define simple assurance and annuity contracts, and develop formulae for the means and variances of the present values of the payments under these contracts, assuming constant deterministic interest.				
	(ii) Describe and use practical methods of evaluating expected values and variances of the simple contracts defined in objective				
	Describe and calculate, using ultimate or select mortality, net premiums and net premium reserves of simple insurance contracts				
	(iv) Describe and calculate, using ultimate or select mortality, net premiums and net premium reserves for increasing and decreasing benefits and annuities.				
	(v) Describe and calculate gross premiums and reserves of assurance and annuity contracts				
Unit No.					
I	Life assurance contracts, Life annuity contracts, The life table, Evaluation of assurances and annuities.				
II	Net premiums and reserves, Variable benefits and with-profit policies, Gross premiums and reserves for fixed and variable benefit contracts				
III	Simple annuities and assurances involving two lives, Contingent and reversionary benefits, Profit testing, Determining reserves using profit testing				
IV	Competing risks, Multiple decrement tables,				
V	Pension funds, Mortality, selection and standardisation				
Text Book	Actuarial mathematics. Bowers, Newton L et al. – 2nd ed. – Society of Actuaries, 1997. 753 pages. ISBN: 0 938959 46 8. (Chapters: 3 to 8, Ch9-Sec 9.1 to 9.7, Ch 10 and Ch 20)				
Reference Book	1. Benjamin, Bernard; Pollard, The analysis of mortality and other actuarial statistics, John H. – 3rd ed. – Faculty and Institute of Actuaries, 1993. 519 pages. ISBN 0 90106626 5. 2. Neill, Alistair, Life contingencies – Heinemann, 1977. 452 pages. ISBN 0 434 91440 1				
Percentage of Syllabus Revised: 100%					

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School of Arts & Science
Ponnaiyah Ramalingam Institute of
Science & Technology (PRIST)
Deemed to be University
Vallam, Thanjavur - 613 403.

Course Code	Course Title	L	T	P	C
22212DSC44F	Game Theory				
AJM	Provide a foundation in the basic concepts of Game Theory Understand Nash's equilibrium Understand Cooperative v/s Non-Cooperative games				
Course Objectives	Clear of how to strategize in day to day situations				
	Take decisions which benefit as many as possible.				
	Model all practical situations as a game and find its solution.				
	When to form coalitions and not.				
Unit No.					
I	Games and Solutions, Game theory and the Theory of Competitive Equilibrium, Rational Behaviour, The Steady State and Deductive Interpretations, Bounded Rationality, Terminology and Notation.				
II	Nash Equilibrium (5 periods) Strategic Games, Nash Equilibrium, Existence of a Nash Equilibrium, Strictly Competitive Games, Bayesian Games: Strategic Games with Imperfect Information.				
III	: Mixed, Correlated, and Evolutionary Equilibrium (4 periods) Mixed Strategy Nash Equilibrium, Interpretations of Mixed Strategy Nash Equilibrium, Correlated Equilibrium, Evolutionary Equilibrium.				
IV	Rationalizability, Iterated Elimination of Dominated Actions (3 periods) Rationalizability, Iterated Elimination of Strictly Dominated Actions, Iterated Elimination of Weakly Dominated Actions.				
V	A Model of Knowledge, Common Knowledge, Can People Agree to Disagree, Knowledge and Solution Concepts, The Electronic Mail Game.				
Text Book	Martin J Osborne and Ariel Rubinstein, A Course in Game Theory, The MIT Press, Cambridge Massachusetts, London.				
Reference Book	N.N. Vorobev, Game Theory, Springer Verlag Publications, 1977.				
Percentage of Syllabus Revised: 100%					

S. S. Srinivasan

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School of Arts & Science
Ponnaiyah Ramalingam Institute of
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Deemed to be University
Valiam, Thanjavur - 613 403.

REPLACED COURSES

Course Code	Course Title	L	T	P	C
22212AEC44	IMAGE PROCESSING				
AIM	Students are expected to have knowledge in linear signals and systems, 1-D Fourier Transform, basic linear algebra, basic probability theory and basic programming techniques; knowledge of Digital Signal Processing is desirable and working knowledge of Matlab.				
Course Objectives	Develop a theoretical foundation of fundamental Digital Image Processing concepts.				
	Provide mathematical foundations for digital manipulation of images; image acquisition; preprocessing; segmentation; Fourier domain processing; and compression.				
	Gain experience and practical techniques to write programs using MATLAB language for digital manipulation of images; image acquisition; preprocessing; segmentation; Fourier domain processing; and compression.				
Unit No.					
I	Introduction And Digital Image Fundamentals: The origins of Digital Image Processing Examples of Fields that Use Digital Image Processing Fundamentals Steps in Image Processing Elements of Digital Image Processing Systems				
II	Introduction And Digital Image Fundamentals (cont.): Image Sampling and Quantization, Some basic relationships like Neighbours, Connectivity, Distance Measures between pixels Translation, Scaling, Rotation and Perspective Projection of image				
III	Introduction And Digital Image Fundamentals (cont.): Linear and Non Linear Operations • Digital image Representation Reading, Displaying, Writing Images using MATLAB Data Classes, Image Types using MATLAB				
IV	Digital image Representation (cont.) Converting Between data classes and Image Types Introduction to M Function Programming using MATLAB • Image Enhancement in the Spatial Domain: Some basic Gray Level Transformations Histogram Processing Quiz 1				
V	Image Enhancement in the Spatial Domain (cont.): Enhancement Using Arithmetic and Logic operations Combining Spatial Enhancement Methods Basics of Spatial Filters				
Text Book	Al Bovik (ed.), "Handbook of Image and Video Processing", Academic Press, 2000. A.K. Jain, "Fundamentals of Digital Image Processing", Prentice-Hall, Addison-				

Dr. Arigumar

H.O.D.

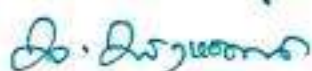
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Science & Technology, Prist
Thanjavur - 613 403

	Wesley, 1989.
Reference Book	W. K. Pratt. Digital image processing, PIKS Inside. Wiley, New York, 3rd, edn., 2001. Stephane Marchand-Maillet, Yazid M. Sharaiha, Binary Digital Image Processing, A Discrete Approach, Academic Press, 2000
Percentage of Syllabus Revised: 100%	



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Dean

School of Arts & Science
Pondicherry Engineering Institute of
Science, Technology & Design (PETD)

Course Code	Course Title	L	T	P	C
22212AEC44	Quantitative Aptitude				
AIM	Students to engage in multiple mathematical ways of thinking that will enhance their ability to make informed decisions as citizens and as potential leaders.				
Course Objectives	It represents a person's level of competency to perform a certain type of task. The entire objective of the 60 hours aptitude building program is to develop the basics of the students towards three segments of aptitude The main goal of courses that satisfy the quantitative reasoning requirement is for students to engage in multiple mathematical ways.				
Unit No.					
I	Number Systems: Computation of Whole Number, Decimal and Fraction , Relationship between numbers				
II	Fundamental Arithmetical Operations Percentages-Ratio and Proportion-Square roots-Averages-Interest (Simple and Compound)-Profit and Loss, Discount-Partnership Business-Mixture and Alligation-Time and distance-Time and work				
III	Algebra Basic algebraic identities of School Algebra and Elementary surds Graphs of Linear Equations				
IV	Geometry Triangle and its various kinds of centres-Congruence and similarity of triangles-Circle and its chords, tangents, angles subtended by chords of a circle, common tangents to two or more circles				
V	Statistics and Probability Use of Tables and Graphs-Histogram-Frequency polygon-Bar-diagram-Pie-chart-Measures of central tendency: mean, median, mode, standard deviation-calculation of simple probabilities				
Text Book	Quantitative Aptitude By Dr. R.S Aggarwal				
Reference Book	Advance Maths		Rakesh Yadav		
	Magical Book on Quicker Maths		M Tyra		
Percentage of Syllabus Revised: 100%					

S. S. Srinivasan

H.O.D.

DEPARTMENT OF MATHEMATICS
PRIST DEEMED TO BE UNIVERSITY
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School of Arts & Sciences
Pondicherry Central Institute of
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Deemed to be University
Vandavasi, Thanjavur - 613 403



MINUTES OF BOARD OF STUDIES MEETING OF COMPUTER SCIENCE

The Minutes of the Board of Studies meeting in Computer Science was held on 29-04-22 by 10.30 a.m. in Department of Computer Science, PRIST University, Thanjavur under the chairmanship of Dr.K.T.Senthil Kumar, Head of the Department of Computer Science.

The following Members were present for the meeting:

1.	Dr.L.Chinnappa	<u>Dean of Arts and Science, PRIST Deemed University</u>
2.	Dr.K.T.Senthil Kumar	<u>HOD/Asst.prof/Chairman</u> PRIST Deemed University
3.	Dr.K.Mohan Kumar	<u>Academic Expert</u> Department of Computer Science, Rajah serfoji government college, Thanjavur,
4.	Mr.S.Karthikeyan Head,	<u>Industrial Expert</u> Quantumsys Technologies, Thanjavur
5.	Dr.K.Saravanan	Prof. PRIST Deemed University, Member Internal
6.	Dr.R.Maranthi	Prof. PRIST Deemed University, Member Internal
7.	Dr.G.Preethi	Asso.prof. PRIST Deemed University, Member Internal
8.	Mrs.M.Aarthi	Asst.prof, PRIST Deemed University, Member Internal
9.	Mrs.R.Suganya	Asst.prof, PRIST Deemed University, Member Internal
10.	Mr.D.S.ChozhaBharathi	Asst.prof, PRIST Deemed University, Member Internal
11.	C.Balaji -B.Sc.(CS)	Alumni
12.	S.Swetha-B.C.A	Student

The Chairman of Board of Studies (BOS) in Computer Science welcomed the members and briefed about the programmes offered by the department.



SCHOOL OF ARTS AND SCIENCE
MINUTES OF BOARD OF STUDIES MEETING OF COMPUTER SCIENCE

AGENDA

- Agendum 1:** To Confirmation of the Previous Meeting Minutes
Discussion: The Minutes of the Board of Studies meeting held on 29 April 2022 were communicated to the members. The comments received have been incorporated and placed for confirmation. The same was approved by the Academic Council.
Resolution: The coordinator read the minutes of earlier meeting and the minutes were reviewed and passed by the members.
- Agendum 2:** Action taken on the Previous Meeting Minutes.
Discussion: The details of the action taken were presented to the members
Resolution: The members expressed satisfaction over the action taken enclosed in Annexure
- Agendum 3:** To scrutinize the stakeholder feedback on UG PG Curriculum
Discussion: To Produce the continuity of courses from BCA, B.Sc, MCA & M.Sc Curriculum the introduction of new courses and value added courses was discussed in the curriculum.
Resolution: The board unanimously resolved to make necessary changes as requested by the stake holders.
- Agendum 4:** To introduced in the curriculum from 2022-2023 Academic year.
Discussion: The Syllabus of new courses in the curriculum for the Academic year 2022-2023
Resolution: The new courses are introduced in the Academic year 2022-2023
- Agendum 5:** To Discuss and finalize the Revision, introduction of new courses in syllabus of subjects in the Department of Computer Science
Discussion: Approval for Revision in syllabus requirements in Department of Computer Science for the Academic Year 2022-2023.
Resolution: After reviewing of the revised syllabus, the Board of Studies members discussed and finalized the revisions of new course introduction made in the syllabus with effect from Academic Year 2022-2023.

Course title	Category(Core: Theory/Practical)	Programme	Year of introduction
22122SEC13	Problem Solving using Python	B.C.A	2022
22122SEC16L	Problem Solving using Python Lab	B.C.A	2022
22122SEC33	Java and Data structures	B.C.A	2022
22122SEC36L	Data structures using Java Lab	B.C.A	2022
22122DSC54D	Block Chain Technology	B.C.A	2022
22122SEC61	Introduction to Data Science	B.C.A	2022
22122SEC64L	Data Science Lab	B.C.A	2022
22120SEC13	Visual Programming	B.Sc.	2022

22120SEC16L	Visual Programming Lab	B.Sc.	2022
22120SEC33	Problem Solving using Python	B.Sc.	2022
22120SEC35L	Problem Solving using Python Lab	B.Sc.	2022
22120SEC43	Java and Data structures	B.Sc.	2022
22120SEC45L	Java and Data structures Lab	B.Sc.	2022
22120DSC54D	Semantic Web	B.Sc.	2022
22120SEC61	Advanced Web Technology	B.Sc.	2022
22222DSC17C	Augmented Reality	MCA	2022

22222DSC17D	Ruby On Rails	MCA	2022
22222DSC17E	Soft computing Techniques	MCA	2022
22222DSC17F	Quantum information and Computation	MCA	2022
22222DSC27D	Haskell programming	MCA	2022
22222DSC27E	Natural Language Processing	MCA	2022
22222DSC27F	Artificial Neural Networks	MCA	2022
22222DSC36D	Software Forensics	MCA	2022
22222DSC36E	Information System Management	MCA	2022
22222DSC36F	Social Media Mining	MCA	2022
22222DSC44A	Design and Analysis of Algorithm	MCA	2022
22222DSC44B	Computer Ethics	MCA	2022
22222DSC44C	Web Mining	MCA	2022
22222DSC44D	Sensor Networks	MCA	2022
22222DSC44E	Graphics and Computer Vision	MCA	2022
22222DSC44F	Agile Frameworks	MCA	2022
22220DSC16C	Internet and HTML Programming	MSC CS	2022
22220DSC16D	Parallel Processing	MSC CS	2022
22220DSC16E	IT Infrastructure and cloud security	MSC CS	2022
22220DSC16F	Service Oriented Architecture and Web Services	MSC CS	2022
22220DSC26C	Rapid Application Development Using Python	MSC CS	2022
22220DSC26D	Client-Server Computing	MSC CS	2022
22220DSC26E	Computer Vision	MSC CS	2022
22220DSC26F	Graphical Programming and Virtual Instrumentation	MSC CS	2022
22220DSC35C	Data Analysis and Business Intelligence	MSC CS	2022
22220DSC35D	Fundamentals of PHP	MSC CS	2022
22220DSC35E	Open Source Technologies	MSC CS	2022
22220DSC35F	Machine Learning	MSC CS	2022
22220DSC43C	Telecommunication Networks and optimization	MSC CS	2022
22220DSC43D	Image Processing	MSC CS	2022
22220DSC43E	Mobile Communication	MSC CS	2022
22220DSC43F	Resource Management Techniques	MSC CS	2022

Agendum 6: To introduce in the curriculum from 2022-2023 Academic year.

Discussion: The Syllabus of Value Added courses in the curriculum for the Academic year 2022-2023 was reviewed.

Resolution: The Value Added courses are introduced in the Academic year 2022-2023.

Name of the course/programme	Course/programme Code	Year of offering
Certificate course on Designing [Photoshop, Premium, Illustrator]	22CC01	2021
Certificate course on Web Application Development and Hosting.	22CC02	2021
Certificate course on Google IT Support	22CC05	2021
Certificate course on Introduction to Cyber Security and Cyber Attacks	22CC06	2022
Certificate course on Network Simulator	22CC07	2022
Diploma course on Graphical Programming[Flash, Swish]	22DIP03	2022

Agendum 7: Organizing industrial visit for students.

Discussion: External experts suggested that Final year BCA, B.Sc, MCA & M.Sc have to be allowed to go for industrial visit so that the students can get industrial experts.

Resolution: After the discussion, the members insisted that final year B.Sc, BCA, M.sc and MCA students have to be taken to industries so as to get industrial exposure and for getting internships.

Agendum 8: Allotment of the panel of examiners for BCA, B.Sc, MCA & M.Sc Programme

Discussion: Members suggested the names of the experts who would serve as panel of examiners for different programme.

Resolution: The BOS approved a tentative list of subject experts for paper setting, moderation and examiners. If required few may be included with the permission of the concerned authorities.

The Chairman of Board of Studies thanked all the members for their kind cooperation and the meeting came to an end.

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Dept of Arts & Science
PRIST Deemed to be University
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SCHOOL OF ARTS AND SCIENCE

DEPARTMENT OF COMPUTER SCIENCE
BCA (BACHELOR OF COMPUTER APPLICATION)

REGULATION 2022 – 2023

COURSE STRUCTURE

SEMESTER – I

Course Code	Course Title - BCA	L	T	P	C
THEORY					
22110AEC11/ 22111AEC11/ 22132AEC11/ 22135AEC11	Tami - I/Advanced English-I/Hindi-I/ French - I	4	0	0	2
22111AEC12	English-I	4	0	0	2
22122SEC13	PROBLEM SOLVING USING PYTHON	5	1	0	4
22112AEC14B	Classical algebra	4	1	0	3
22112AEC15B	Numerical and statistical Methods	4	1	0	4
PRACTICAL					
22122SEC16L	PROBLEM SOLVING USING PYTHON LAB	0	0	3	2
	Total	21	3	3	17
AUDIT COURSE					
221LSCIC	Indian Constitution	-	-	-	2
221LSCUV	Universal Human Values	-	-	-	2

SEMESTER – II

Course Code	Course Title	L	T	P	C
THEORY					
22110AEC21/ 22111AEC21/ 22132AEC21/ 22135AEC21	Tamil – II/ Advanced English-II/Hindi-II/ French – II	4	0	0	2
22111AEC22	English-II	4	0	0	2
22122SEC23	Data Structure and Algorithms	5	1	0	4
22112AEC24B	Discrete Mathematics	4	1	0	4
22112AEC25B	Operations Research	4	1	0	3
PRACTICAL					
22122SEC26L	Data Structure and Algorithms Lab	0	0	3	2
RESEARCH SKILL BASED COURSE					
22122RLC27	Research Led Seminar	-	-	-	1
Total		21	3	3	18
AUDIT COURSES					
221LSCCS	Communication Skills	-	-	-	2
221SSCBE	Basic Behavioral Etiquette	-	-	-	2

SEMESTER – III

Course Code	Course Title	L	T	P	C
THEORY					
22110AEC31/ 22132AEC31/ 22111AEC31/ 22135AEC31	Tamil – III/Hindi-III/Advanced English-III/ French – III	4	0	0	2
22111AEC32	English-III	4	0	0	2
22122SEC33	Java and Data Structures	4	1	0	4
22161SEC34	Financial Accounting	4	1	0	4
22113AEC35A	Allied Physics –I	3	1	0	3
PRACTICAL					
22122SEC36L	Data Structure using Java Lab	0	0	3	2
RESEARCH SKILL BASED COURSE					
22122RMC37	Research Methodology	2	0	0	2
Total		21	3	3	19
AUDIT COURSE					
221ACL50AN	Office Automation	-	-	-	2

SEMESTER – IV

Course Code	Course Title	L	T	P	C
THEORY					
22110AEC41/ 22111AEC41/ 22132AEC41/ 19135AEC41	Tamil-IV/Advanced English-IV /Hindi-IV/ French – IV	4	0	0	2
22111AEC42	English-IV	4	0	0	2
22122SEC43	Visual Programming	4	1	0	4
22113AEC44A	Allied Physics –II	5	1	0	5
221EYNSTU	Environmental Studies	2	0	0	2
PRACTICAL					
22122SEC45L	Visual Programming Lab	0	0	3	2
22113AEC46AL	Allied Physics Lab –I	0	0	3	2
	Total	19	2	6	19
AUDIT COURSE					
221LSCLS	Leadership and Management Skills	-	-	-	2
221SSCAQ	General Aptitude and Quantitative Ability				2

SEMESTER – V

Course Code	Course Title	L	T	P	C
THEORY					
22122SEC51	Relational Database Management Systems	4	1	0	4
22122SEC52	.NET Programming	4	1	0	3
22122SEC53	Designing and supporting Computer Networks	4	1	0	4
22122DSC54	Discipline Specific Elective -I	4	1	0	3
PRACTICAL					
22122SEC55L	Oracle Lab	0	0	3	2
22122SEC56L	.NET Programming Lab	0	0	3	2
RESEARCH SKILL BASED COURSE					
22122BRC57	Participation in Bounded Research	-	-	-	1
Total		16	4	6	19
AUDIT COURSE					
221ACLSPSL	Professional Skills	-	-	-	2

SEMESTER – VI

Course Code	Course Title	L	T	P	C
THEORY					
22122SEC61	Introduction to Data Science	4	1	0	4
22122SEC62	Operating System	4	1	0	5
22122DSC63_	Discipline Specific Elective –II	4	1	0	3
221_ _OEC(2 Digit Course Name)	Open Elective	4	0	0	2
PRACTICAL					
22122SEC64L	Data Science Lab	0	0	3	2
22122SEC65L	Operating System Lab	0	0	3	2
22122PRW66	Project Work	-	-	-	4
22122PROEE	Program Exit Examination	-	-	-	1
Total		16	3	6	23
AUDIT COURSE					
221SSCIM	Interview Skills Training and Mock Test	-	-	-	2
221LSCCE	Community Engagement	-	-	-	2
Total Credits –Programme					115
Total Credits - Audit Courses					22

Discipline Specific Electives

Semester	Discipline Specific Elective Courses
V	a) 22122DSC54A - Computer Organization and Architecture b) 22122DSC54B - E-learning c) 22121DSC54C- Enterprise Resource Planning d) 22122DSC54D - Block Chain Technology
VI	a) 22122DSC63A - Software Project Management b) 22122DSC63B - Object Oriented Analysis and Design c) 22122DSC63C -Ethical Hacking d) 22122DSC63D - WAP and WML

Open Electives

Semester	Open Elective Courses
VI	a) 221TNOEC-Tamil IlakkiyaVaralaru b) 221ENOEC-Journalism c) 221MAOEC-Development of Mathematical Skills d) 221PHOEC-Instrumentation e) 221CEOEC-Food and Adulteration f) 221MBOEC-Wildlife Conservation g) 221BTOEC-Mushroom Technology h) 221CSOEC-E-Learning i) 221CMOEC-Banking Service

Skill based Electives

Credit Distribution

Sem	AEC	SEC	DSC	OEC	Research	Others	Total
I	11	6	-	-	-	-	17
II	11	6	-	-	1	-	18
III	7	10	-	-	2	-	19
IV	11	6	-	-	-	2	19
V		15	3	-	1	-	19
VI		13	3	2	4	1	23
TOTAL	44	52	6	2	8	3	115



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SCHOOL OF ARTS & SCIENCE

DEPARTMENT OF COMPUTER SCIENCE

**M.C.A.,
REGULATION 2022-2023 - COURSE STRUCTURE**

(For the candidates admitted in the academic year 2022-2023 onwards)

Semester I

Course Code	Course Title	L	T	P	C
22222SEC11	Advanced Data Science	4	0	0	4
22222SEC12	Advance Database Management System	4	0	0	4
22222SEC13	Routing and Switching in LAN	4	0	0	4
22212SEC14	Discrete Mathematics	4	0	0	4
22222SEC15L	Advanced Data Science Lab	0	0	3	2
22222SEC16L	Advance Database Management System Lab	0	0	3	2
22222DSC17	Discipline Specific Elective - I	4	0	0	4
22222RLC18	Research Led Seminar	-	-	-	1
	Total	22	0	6	25

Semester II

Course Code	Course Title	L	T	P	C
22222SEC21	Python Programming	4	0	0	4
22222SEC22	Cryptography Network security	4	1	0	3
22222SEC23	Open Source programming	4	0	0	3
22222SEC24	Web Service	4	0	0	3
22222SEC25L	Python Programming Lab	0	0	3	2
22222SEC26L	Open Source programming Lab	0	0	3	2
22222DSC27	Discipline Specific Elective – II	5	0	0	4
22222RMC28	Research Methodology	3	0	0	2
22222BRC29	Participation in Bounded Research	0	0	0	2
	Total	24	1	6	25

Semester III

Course Code	Course Title	L	T	P	C
22222SEC31	Data mining and warehousing	6	1	0	5
22222SEC32	Grid and Cloud Computing	6	1	0	4
22222SEC33	.NET Programming	5	0	0	4
22222SEC34	Object Oriented System Design	5	0	0	4
22222SEC35L	.NET Programming Lab	0	0	3	2
22222DSC36	Discipline Specific Elective – III	5	0	0	4
22222SRC37	Societal project (Mini Project)	0	0	0	2
	Total	27	2	3	25

Semester IV

Course Code	Course Title	L	T	P	C
22222SEC41	Human Computer Interaction.	6	0	0	4
22222SEC42	Software Project Management.	6	0	0	4
22222SEC43	Big Data	6	0	0	5
22222PRW44	Project work	0	0	15	10
22222PEE	Program Exit Examination	-	-	-	2
	Total	18	0	15	25
	Total Credits of the Programme				100

DISCIPLINE SPECIFIC ELECTIVE COURSES:

Semester	Discipline Specific Elective Courses
I	a) 22222DSC17A - Mobile Computing b) 22222DSC17B - Knowledge based decision support system c) 22222DSC17C - Augmented Reality d) 22222DSC17D - Ruby On Rails e) 22222DSC17E - Soft computing Techniques f) 22222DSC17F - Quantum information and Computation
II	a) 22222DSC27D - Haskell programming b) 22222DSC27E - Natural Language Processing c) 22222DSC27F - Artificial Neural Networks
III	a) 22222DSC36D - Software Forensics b) 22222DSC36E - Information System Management c) 22222DSC36F - Social Media Mining
IV	a) 22222DSC44A - Design and Analysis of Algorithm b) 22222DSC44B - Computer Ethics c) 22222DSC44C - Web Mining d) 22222DSC44D - Sensor Networks e) 22222DSC44E - Graphics and Computer Vision f) 22222DSC44F - Agile Frameworks

Credit Distribution:

Sem	AEC	SEC	DSC	OEC	Research	Others	Total
I	4	16	4		1		25
II		17	4		4		25
III		19	4		2		25
IV		13			10	2	25
TOTAL	4	65	12		17	2	100



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SCHOOL OF ARTS AND SCIENCE

DEPARTMENT OF COMPUTER SCIENCE
B.Sc. COMPUTER SCIENCE
REGULATION 2022 - 2023
COURSE STRUCTURE SEMESTER - I

Course Code	Course Title - B.Sc(CS)	L	T	P	C
THEORY					
22110AEC11/ 22111AEC11/ 22132AEC11/ 22135AEC11	Tami - I/Advanced English-I/Hindi-I/ French - I	4	0	0	2
22111AEC12	English-I	4	0	0	2
22120SEC13	Visual Programming	5	1	0	4
22112AEC14B	Classical algebra	4	1	0	3
22112AEC15B	Numerical and statistical Methods	4	1	0	4
PRACTICAL					
22120SEC16L	Visual Programming Lab	0	0	3	2
	Total	21	3	3	17
AUDIT COURSE					
221LSCIC	Indian Constitution	-	-	-	2
221LSCUV	Universal Human Values	-	-	-	2

SEMESTER – II

Course Code	Course Title	L	T	P	C
THEORY					
22110AEC21/ 22111AEC21/ 22132AEC21/ 22135AEC21	Tamil – II/ Advanced English-II/Hindi-II/ French – II	4	0	0	2
22111AEC22	English-II	4	0	0	2
22120SEC23	Internet and Java Programming	5	1	0	4
22112AEC24B	Discrete Mathematics	4	1	0	4
22112AEC25B	Operations Research	4	1	0	3
PRACTICAL					
22120SEC26L	Internet and Java Programming Lab	0	0	3	2
RESEARCH SKILL BASED COURSE					
22122RLC27	Research Led Seminar	-	-	-	1
	Total	21	3	3	18
AUDIT COURSES					
201LSCCS	Communication Skills	-	-	-	2
201SSCBE	Basic Behavioral Etiquette	-	-	-	2

SEMESTER – III

Course Code	Course Title	L	T	P	C
THEORY					
22110AEC31/ 22132AEC31/ 22111AEC31/ 22135AEC31	Tamil – III/Hindi-III/Advanced English-III/ French – III	4	0	0	2
22111AEC32	English-III	4	0	0	2
22120SEC33	Problem Solving using Python	4	1	0	4
22113AEC34A	Applied Physics -I	4	1	0	5
PRACTICAL					
22120SEC35L	Problem Solving using Python Lab	0	0	3	2
22113AEC36AL	Applied physics Lab – I	0	0	3	2
RESEARCH SKILL BASED COURSE					
22120RMC37	Research Methodology	2	0	0	2
Total		18	2	6	19
AUDIT COURSE					
221ACLSOAN	Office Automation	-	-	-	2

SEMESTER – IV

Course Code	Course Title	L	T	P	C
THEORY					
22110AEC41/ 22111AEC41/ 22132AEC41/ 19135AEC41	Tamil-IV/Advanced English-IV /Hindi-IV/ French – IV	4	0	0	2
22111AEC42	English-IV	4	0	0	2
22120SEC43	Java and Data structures	4	1	0	4
22113AEC44A	Applied Physics –II	5	1	0	5
221ENSTU45	Environmental Studies	2	0	0	2
PRACTICAL					
22120SEC45L	Java and Data structures Lab	0	0	3	2
22113AEC47AL	Applied Physics Lab –II	0	0	3	2
	Total	19	2	6	19
AUDIT COURSE					
221LSCLS	Leadership and Management Skills	-	-	-	2
221SSCAQ	General Aptitude and Quantitative Ability				2

SEMESTER – V

Course Code	Course Title	L	T	P	C
THEORY					
22120SEC51	Data Communication and Networking	4	1	0	4
22120SEC52	Operating System	4	1	0	3
22120SEC53	Microprocessor and its Applications	4	1	0	4
22120DSC54	Discipline Specific Elective -I	4	1	0	3
PRACTICAL					
22120SEC55L	Microprocessor Lab	0	0	3	2
22120SEC56L	Operating System Lab	0	0	3	2
RESEARCH SKILL BASED COURSE					
22120BRC57	Participation in Bounded Research	-	-	-	1
	Total	16	4	6	19
AUDIT COURSE					
221ACLSPSL	Professional Skills	-	-	-	2

SEMESTER – VI

Course Code	Course Title	L	T	P	C
THEORY					
22120SEC61	Advanced Web Technology	4	1	0	4
22120SEC62	Relational Data Base Management System	4	1	0	5
22120DSC63_	Discipline Specific Elective –II	4	1	0	3
221__OEC(2 Digit Course Name)	Open Elective	4	0	0	2
PRACTICAL					
22120SEC64L	.NET Programming Lab	0	0	3	2
22120SEC65L	Oracle Lab	0	0	3	2
22120PRW66	Project Work	-	-	-	4
22120PROEE	Program Exit Examination	-	-	-	1
Total		16	3	6	23
AUDIT COURSE					
221SSCIM	Interview Skills Training and Mock Test	-	-	-	2
221LSCCE	Community Engagement	-	-	-	2
Total Credits –Programme					115
Total Credits - Audit Courses					19

Discipline Specific Electives

Semester	Discipline Specific Elective Courses
V	a)22120DSC56A- Cloud Computing b)22120DSC56B- Middleware Technology c)22120DSC56C- Enterprise Resource Planning
VI	a) 22120DSC65A- Data Mining b) 22120DSC65B-Artificial Intelligence and Expert System c)22120DSC65C-Ethical Hacking
V	22120DSC54D – Semantic Web

Open Electives

Semester	Open Elective Courses
VI	a) 221TAOEC-Tamil HakkiyaVaralaru b) 221MAOEC-Development of Mathematical Skills c) 221PHOEC-Instrumentation d) 221CHOEC-Food and Adulteration e) 221MBOEC-Wildlife Conservation f) 221CSOEC-Web Technology g) 221CMOEC-Banking Service

Credit Distribution:

Sem	AEC	SEC	DSC	OEC	Research	Others	Total
I	4	16	4		1		25
II		17	4		4		25
III		19	4		2		25
IV		13			10	2	25
TOTAL	4	65	12		17	2	100



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SCHOOL OF ARTS AND SCIENCE

DEPARTMENT OF COMPUTER SCIENCE

M.Sc. COMPUTER SCIENCE

REGULATION 2022 – 2023

COURSE STRUCTURE SEMESTER - I

Course Code	Course Title	L	T	P	C
	Semester I				
22220SEC11	J2EE Programming	6	0	0	4
2220SEC12	RDBMS	6	0	0	4
22212SEC13	Discrete Mathematics	6	0	0	4
22220SEC14L	J2EE programming Lab	0	0	3	2
22220SEC15L	RDBMS Lab	0	0	3	2
22220DSEC16	Discipline Specific Elective - I	6	0	0	4
22220RLC17	Research Led Seminar	-	-	-	1
	Total	24	0	6	21

Semester II

Course Code	Course Title	L	T	P	C
22220SEC21	Python Programming	5	0	0	4
22220SEC22	Cryptography & Network Security	5	0	0	4
22220SEC23	Software Engineering	5	0	0	4
22220SEC24L	Python Programming Lab	0	0	3	2
22220SEC25L	UNIX Lab	0	0	3	2
22220DSC26	Discipline Specific Elective – II	5	0	0	4
22220RMC27	Research Methodology	4	0	0	2
22220BRC28	Participation in Bounded Research	-	-	-	2
	Total	24	0	6	24

Semester III

Course Code	Course Title	L	T	P	C
22220SEC31	Open Source programming	6	0	0	6
22220SEC32	.Net Programming	6	0	0	5
22220SEC33L	Open Source programming Lab	0	0	3	2
22220SEC34L	.Net Programming Lab	0	0	3	2
22220DSC35_	Discipline Specific Elective – III	5	0	0	4
222__OEC	Open Elective Course	4	0	0	3
22220SRC37	Societal project (Mini Project)	0	0	0	2
	Total	21	0	6	24

Semester IV

Course Code	Course Title	L	T	P	C
22220SEC41	Software Testing	6	0	0	6
22220SEC42	Human Computer Interaction	6	0	0	5
22220DSC43_	Discipline Specific Elective - IV	4	0	0	4
22220PRW44	Project work	0	0	0	10
22220PEE	Programme Exit Examination	-	-	-	2
	Total	14	0	0	27
	Total credits for the program				96

Discipline Specific Electives

Semester	Discipline Specific Elective Courses
I	a) 22220DSC16A - WAP and XML b) 22220DSC16B - Advanced Computer Architecture c) 22220DSC16C - Internet and HTML Programming d) 22220DSC16D - Parallel Processing e) 22220DSC16E - IT Infrastructure and cloud security f) 22220DSC16F - Service Oriented Architecture and Web Services
II	a) 22220DSC26A - Artificial Intelligence b) 22220DSC26B - Distributed Operating System c) 22220DSC26C - Rapid Application Development Using Python d) 22220DSC26D - Client Server Computing e) 22220DSC26E - Computer Vision f) 22220DSC26F - Graphical programming and visual
III	a) 20220DSC35A - Real time Operating Systems b) 22220DSC35B - Wireless Communication Network c) 22220DSC35C - Data Analysis and Business Intelligence d) 22220DSC35D - Fundamentals of PHP e) 22220DSC35E - Open Source Technologies f) 22220DSC35F - Machine Learning

IV	a) 22220DSC43A - Multimedia and its application b) 22220DSC43B - Middleware Technology c) 22220DSC43C - Telecommunication and Networks and Optimization d) 22220DSC43D – Image Processing e) 22220DSC43E - Mobile Communication f) 22220DSC43F - Resource Management Techniques

Open Electives

Semester	Open Elective Courses
III	a) 222ENDEC – Writing for the Media b) 222MAOEC-Applicable Mathematics Techniques c) 222PHOEC-Bio-medical Instrumentation d) 222CHOEC-Green Chemistry e) 222BCOEC-Herbal Medicines f) 222CMOEC- Financial Service

CREDIT DISTRIBUTION

SEMESTER	AEC	SEC	DSC	OEC	RESEARCH	OTHERS	TOTAL
I	4	12	4		1		21
II		15	4		4		24
III		15	4	3	2		24
IV		11	4		10	2	27
TOTAL	4	59	12	2	15	2	96

SIGNATURE OF THE MEMBERS PRESENT

S.No.	NAME OF THE MEMBERS	SIGNATURE
1.	Dr.K. T.Senthil Kumar	
2.	Dr.K.Mohan Kumar	
3.	Mr.S.Karthikeyan	
4.	Dr.K.Saravanan	
5.	Dr.R.Maruthi	
6.	Dr.G.Preethi	
7.	Mrs.M.Aarthi	
8.	Mrs.R.Suganya	
9.	Mr.D.S.ChozhaBharathi	
10.	Mr.K.Vijayabaskar	



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SCHOOL OF ARTS & SCIENCE
DEPARTMENT OF COMPUTER SCIENCE

NEW COURSES
2022-23

BCA (BACHELOR OF COMPUTER APPLICATION)
REGULATION 2022 – 2023

Course Code	Course Title	L	T	P	C
22122SEC13	PROBLEM SOLVING USING PYTHON	0	0	3	4

UNIT – I

Introduction: The essence of computational problem solving – Limits of computational problem Solving-Computer algorithms-The process of computational problem solving-Python programming language - Literals - Variables and Identifiers - Operators - Expressions and Data types.

UNIT - II

Control Structures: Boolean Expressions - Selection Control - If Statement- Indentation in Python-Multi-Way Selection – Iterative Control- While Statement- Infinite loops- Definite vs. Indefinite Loops- Boolean Flags and Indefinite Loops. Lists: List Structures - Lists in Python- Iterating overlists in Python.

UNIT - III

Functions: Program Routines- Defining Functions- More on Functions: Calling Value-Returning Functions- Calling Non-Value-Returning Functions- Parameter Passing - Keyword Arguments in Python –

UNIT - V

Objects and their use: Software Objects - Turtle Graphics – Turtle-attributes-Modular Design: Modules - Top-Down Design - Python Modules.

UNIT - V

Dictionaries and Sets: Dictionary type in Python - Set Data type. Object Oriented Programming using Python: Encapsulation - Inheritance – Polymorphism.

TEXT BOOKS

- a) Charles Dierbach, "Introduction to Computer Science using Python - A computational Problem solving Focus", Wiley India Edition, 2015.

REFERENCE BOOKS:

1. Mark Lutz, "Learning Python Powerful Object Oriented Programming", O'reilly Media 2018, 5th Edition.
2. Timothy A. Budd, "Exploring Python", Tata MCGraw Hill Education Private Limited 2011, 1st Edition.

3. Allen Downey, Jeffrey Elkner, Chris Meyers, "*How to think like a computer scientist: learning with Python*", 2012.

4. Sheetal Taneja & Naveen kumar, "*Python Programming a Modular approach – A Modular approach with Graphics, Database, Mobile and Web applications*", Pearson, 2017.

5. Ch Satyanarayana M Radhika Mani, B N Jagadesh, "*Python programming*", Universities Press 2018.

Course Code	Course Title	L	T	P	C
22122SEC16L	PROBLEM SOLVING USING PYTHON LAB	0	0	3	3

LIST OF EXERCISES:

1. Program to convert the given temperature from Fahrenheit to Celsius and vice versa depending upon user's choice.
2. Program to calculate total marks, percentage and grade of a student. Marks obtained in each of the five subjects are to be input by user. Assign grades according to the following criteria:
Grade A: Percentage ≥ 80 Grade B: Percentage ≥ 70 and < 80
Grade C: Percentage ≥ 60 and < 70 Grade D: Percentage ≥ 40 and < 60
Grade E: Percentage < 40
3. Program, to find the area of rectangle, square, circle and triangle by accepting suitable input parameters from user.
4. Program to display the first n terms of Fibonacci series.
5. Program to find factorial of the given number using recursive function.
6. Write a Python program to count the number of even and odd numbers from array of N numbers.
7. Python function that accepts a string and calculate the number of upper case letters and lower case letters.
8. Python program to reverse a given string and check whether the give string is palindrome or not.
9. Write a program to find sum of all items in a dictionary.
10. Read a file content and copy only the contents at odd lines into a new file.

Course Code	Course Title	L	T	P	C
22122SEC33	JAVA AND DATASTRUCTURES	4	1	0	4

UNIT I

Algorithms, Performance analysis- time complexity and space complexity, Asymptotic Notation-Big Oh, Omega and Theta notations, Complexity Analysis Examples. Data structures-Linear and non linear data structures, ADT concept, Linear List ADT, Array representation, Linked representation, Vector representation, singly linked lists -insertion, deletion, search operations, doubly linked lists-insertion, deletion operations, circular lists, Representation of single, two dimensional arrays, Sparse matrices and their representation.

UNIT II

Stack and Queue ADTs, array and linked list representations, infix to postfix conversion using stack, implementation of recursion, Circular queue-insertion and deletion, Dequeue ADT, array and linked list representations, Priority queue ADT, implementation using Heaps, Insertion into a Max Heap, Deletion from a Max Heap, java.util package-Array List, Linked List, Vector classes, Stacks and Queues in java.util, Iterators in java.util.

UNIT III

Searching-Linear and binary search methods, Hashing-Hash functions, Collision Resolution methods-Open Addressing, Chaining, Hashing in java.util-Hash Map, Hash Set, Hash table. Sorting -Bubble sort, Insertion sort, Quick sort, Merge sort, Heap sort, Radix sort, comparison of sorting methods.

UNIT IV

Trees- Ordinary and Binary trees terminology, Properties of Binary trees, Binary tree ADT; representations, recursive and non recursive traversals, Java code for traversals, Threaded binary trees. Graphs- Graphs terminology, Graph ADT, representations, graph traversals/search methods-dfs and bfs, Java code for graph traversals, Applications of Graphs- Minimum cost spanning tree using Kruskal's algorithm, Dijkstra's algorithm for Single Source Shortest Path Problem.

UNIT V

Search trees- Binary search tree-Binary search tree ADT, insertion, deletion and searching operations, Balanced search trees, AVL trees-Definition and examples only, Red Black trees - Definition and examples only, B-Trees-definition, insertion and searching operations, Trees in java.util- Tree Set, Tree Map Classes, Tries(examples only),Comparison of Search trees. Text compression-Huffman coding and decoding, Pattern matching-KMP algorithm.

TEXT BOOKS:

1. S. Sahni, "Data structures, Algorithms and Applications in Java", Universities Press. [ISBN:0-07-109217-x]
2. Adam Drozdek, "Data structures and Algorithms in Java", 3rd edition, Cengage Learning. [ISBN:978-9814239233]

REFERENCE BOOKS:

1. R.Lafore "Data structures and Algorithms in Java", Pearson education. ISBN: 9788131718124.
2. J.P.Tremblay and G.A.Cheston "Data structures and Software Development in an ObjectOriented Domain", Java edition, Pearson Education.

Course Code	Course Title	L	T	P	C
22122SEC36L	JAVA AND DATASTRUCTURES LAB	0	0	3	2

1. Write Java programs that use both recursive and non-recursive functions for implementing the following searching methods: a) Linear search b) Binary search

2. Write Java programs to implement the following using arrays and linked lists a) List ADT

3. Write Java programs to implement the following using an array. a) Stack ADT b) Queue ADT

4. Write a Java program that reads an infix expression and converts the expression to postfix form. (Use stack ADT).

5. Write a Java program to implement circular queue ADT using an array.

6. Write a Java program that uses both a stack and a queue to test whether the given string is a palindrome or not.

7. Write Java programs to implement the following using a singly linked list. a) Stack ADT b) Queue ADT

8. Write Java programs to implement the deque (double ended queue) ADT using a) Array b) Singly linked list c) Doubly linked list.

9. Write a Java program to implement priority queue ADT.

10. Write a Java program to perform the following operations: a) Construct a binary search tree of elements. b) Search for a key element in the above binary search tree.

Course Code	Course Title	L	T	P	C
22122DSC63D	WAP AND WML	0	0	3	4

Unit I

Overview of WAP: WAP and the wireless world – WAP application architecture – WAP internal structure – WAP versus the Web – WAP 1.2 – WTA and push features. Setting up WAP: Available software products – WAP resources – The Development Toolkits.

Unit II

WAP gateways: Definition – Functionality of a WAP gateway – The Web model versus the WAP model – Positioning of a WAP gateway in the network – Selecting a WAP gateway
Basic WML: Extensible markup language – WML structure – A basic WML card – Text formatting – navigation – Advanced display features.

Unit III

Interacting with the user: Making a selection – Events – Variables – Input and parameter passing. WML Script: Need for WML script – Lexical Structure – Variables and literals – Operators – Automatic data type conversion – Control Constructs Functions – Using the standard libraries – programs – Dealing with Errors.

Unit IV

XML: Introduction XML: An Eagle's Eye view of XML – XML Definition – List of an XML Document – Related Technologies – An introduction to XML Applications – XML Applications – XML for XML – First XML Documents Structuring Data: Examining the Data XMLizing the data – The advantages of the XML format – Preparing a style sheet for Document Display.

Unit V

Attributes, Empty Tags and XSL: Attributes – Attributes Versus Elements – Empty Tags – XSL – Well formed XML documents – Foreign Languages and Non Roman Text – Non Roman Scripts on the Web Scripts, Character sets, Fonts and Glyphs – Legacy character sets – The Unicode Character set – Procedure to Write XML Unicode.

Text Books:

- 1) For Unit I, II, III
Charles Archart and Others. "Professional WAP with WML, WML script, ASP, JSP, XML, XSLT, WTA Push and Voice XML" Shroff Publishers and Distributers Pvt. Ltd 2000.
- 2) For Unit IV & V
Eliotte Rusty Harlod "XML TM Bible", Books India (P) Ltd, 2000

Course Code	Course Title	L	T	P	C
22122SEC61	INTRODUCTION TO DATA SCIENCE	0	0	3	4

Unit – I:

Introduction Introduction to Data Science – Evolution of Data Science – Data Science Roles – Stages in a Data Science Project – Applications of Data Science in various fields – Data Security Issues.

Unit – II:

Data Collection and Data Pre-Processing Data Collection Strategies – Data Pre-Processing Overview – Data Cleaning – Data Integration and Transformation – Data Reduction – Data Discretization.

Unit – III:

Exploratory Data Analytics Descriptive Statistics – Mean, Standard Deviation, Skewness and Kurtosis – Box Plots – Pivot Table – Heat Map – Correlation Statistics – ANOVA.

Unit – IV:

Model Development Simple and Multiple Regression – Model Evaluation using Visualization – Residual Plot – Distribution Plot – Polynomial Regression and Pipelines – Measures for In-sample Evaluation – Prediction and Decision Making.

Unit – V:

Model Evaluation Generalization Error – Out-of-Sample Evaluation Metrics – Cross Validation – Overfitting – Under Fitting and Model Selection – Prediction by using Ridge Regression – Testing Multiple Parameters by using Grid Search.

REFERENCES:

1. Jojo Moolayil, "Smarter Decisions : The Intersection of IoT and Data Science", PACKT, 2016.
2. Cathy O'Neil and Rachel Schutt , "Doing Data Science", O'Reilly, 2015.
3. David Dietrich, Barry Heller, Beibei Yang, "Data Science and Big data Analytics", EMC 2013
4. Raj, Pethuru, "Handbook of Research on Cloud Infrastructures for Big Data Analytics", IGI Global.

Course Code	Course Title	L	T	P	C
22122SEC64L	DATA SCIENCE LAB	0	0	3	3

1. Editing and executing Programs involving Flow Controls.
2. Editing and executing Programs involving Functions.
3. Program in String Manipulations
4. Creating and manipulating a Tuple
5. Creating and manipulating a List
6. Creating and manipulating a Dictionary
7. Object Creation and Usage
8. Program involving Inheritance
9. Program involving Overloading
10. Reading and Writing with Text Files and Binary Files
11. Combining and Merging Data Sets
12. Program involving Regular Expressions
13. Data Aggregation and GroupWise Operations.

Course Code	Course Title	L	T	P	C
22121DSC54D	BLOCK CHAIN TECHNOLOGY	0	0	3	4

UNIT I

Discover Block chain Technology: Blockchain, Growth of blockchain technology, Distributed systems, History of blockchain and Bitcoin, Types of blockchain.

UNIT II

Blockchain: Architecture, Versions, Variants, Use cases, Life use cases of blockchain, Blockchain vs shared Database, Introduction to cryptocurrencies, Types, Applications. Bitcoins: Introducing Bitcoin, Bitcoin digital keys and addresses, Transactions, Blockchain mining. Alternative Coins, Limitations of Bitcoin.

UNIT III

Concept of Double Spending, Hashing, Proof of work. Bitcoin Network and payments, Bitcoin network, Wallets, Bitcoin payments, Innovation in Bitcoin, Bitcoin Clients and APIs.

UNIT IV

Introduction to Block chain Platforms: Ethereum, Hyperledger, IOTA, EOS, Multichain, Bigchain, etc. Advantages and Disadvantages, EthereumvsBitcoin, Design a new block chain, Potential for disruption, Design a distributed application, Block chain applications.

UNIT V

Decentralization: Methods of decentralization, Routes of decentralization, Block chain and full ecosystem decentralization, Smart contracts, Decentralized organizations and platforms for decentralization.

Textbook/ Textbooks:

Mastering Block chain - Distributed ledgers, decentralization and smart contracts explained, Author- Imran Bashir, Packt Publishing Ltd, Second Edition, ISBN 978-1- 78712-544-5, 2017

Reference Books

Blockchain Basics: A Non-Technical Introduction in 25 Steps, Author- Daniel Drescher, Apress, First Edition, 2017

Course Code	Course Title	L	T	P	C
22120SEC33	Visual Programming	4	1	0	4

AIM:

To equip the students with principles of various visual programming environment

OBJECTIVE:

- 7 To learn the basic principles of visual programming
- ↓ To study the necessary skills to create software solutions using visual programming
- 3 Understood the Open Data Base Connectivity using Visual programming.
- 3 To inculcate knowledge on Programming and Project Development using Visual Basic.

UNIT I

Visual Basic – Integrated Development Environment (IDE) features – VB editor – customizing the IDE – anatomy of a form working with form properties – setting form's properties – introducing form events and form methods.

UNIT II

Variables in Visual Basic : Declaring variables – Data types – Null values, Error value – emptyvalue – the scope of a variable – Module level variable – Constants – Creating your own constants – Scope of a constant – Converting data types – arrays – Declaring arrays – Fixed size arrays – Dynamicarrays – Preserve keywords – ReDim. Writing code in Visual Basic – The anatomy of a procedure – Subroutine and Functions – Language constructs – For...Next, The While loop, Select case...End select, Exit statement, with structure.

UNIT III

Selecting and Using controls – Introduction to standard controls: command buttons – Text boxes – labels – frames – option buttons – Check boxes – Scroll Bars – Timer – working with CommonDialog Control.

UNIT IV

The Image list control – the List view control – slider control – status bar control – Tool bar control – The Tree view control – Menu editor. –File System Controls (Drive, Dirlist, File List boxes).

UNIT V

OLE properties – OLE automation – building COM/OLE DLL servers – Data control – design time (for access – style databases) – programming with the data control – Database access – set using SQL – transaction control – testing the control – Open Database Connectivity.

Course Code	Course Title	L	T	P	C
22120SEC35L	Visual Programming Lab	0	0	3	2

1. Simple exercises using standard controls.
2. Write a program to design a calendar of any year.
3. Write a program to expand and shrinking an object – while program is running.
4. Write a code to design and implement a scientific calculator.
5. Write a program to create animation by using move method and timer Object.
6. Write a program for preparing students mark list.
7. Write a program to populate the label entities using data bound control.
8. Write a program to expand and shrink Objects using timer control and move method

Course Code	Course Title	L	T	P	C
22120SEC13	PROBLEM SOLVING USING PYTHON	0	0	3	4

OBJECTIVES:

- _ Describe the core syntax and semantics of Python programming language.
- _ Discover the need for working with the strings and functions.
- _ Illustrate the process of structuring the data using lists, dictionaries, tuples and sets.
- _ Understand the usage of packages and Dictionaries.

OUTCOMES:

- To understand the principles of Python and acquire skills in programming in python
- To develop the emerging applications of relevant field using Python
- Interpret the fundamental Python syntax and semantics and be fluent in the use of Python control flow statements.
- Able to develop simple turtle graphics programs in Python

UNIT - I

Introduction: The essence of computational problem solving – Limits of computational problem solving-Computer algorithms-The process of computational problem solving-Python programming language - Literals - Variables and Identifiers - Operators - Expressions and Data types.

UNIT - II

Control Structures: Boolean Expressions - Selection Control - If Statement- Indentation in Python- Multi-Way Selection – Iterative Control- While Statement- Infinite loops- Definite vs. Indefinite Loops- Boolean Flags and Indefinite Loops. Lists: List Structures - Lists in Python - Iterating over lists in Python.

UNIT - III

Functions: Program Routines- Defining Functions- More on Functions: Calling Value-Returning Functions- Calling Non-Value-Returning Functions- Parameter Passing - Keyword Arguments in Python–

UNIT - V

Objects and their use: Software Objects - Turtle Graphics – Turtle attributes-Modular Design: Modules - Top-Down Design - Python Modules.

UNIT - V

Dictionaries and Sets: Dictionary type in Python - Set Data type, Object Oriented Programming using Python: Encapsulation - Inheritance – Polymorphism.

TEXT BOOKS

1. Charles Dierbach, "Introduction to Computer Science using Python - A computational Problem solving Focus", Wiley India Edition, 2015.

Course Code	Course Title	L	T	P	C
21120SEC16L	PROBLEM SOLVING USING PYTHON LAB	0	0	3	4

- _ understand the numeric or real life application problems and solve them.
- _ Apply a solution clearly and accurately in a program using Python.
- _ Apply the best features available in Python to solve the situational problems.

LIST OF EXERCISES:

1. Program to convert the given temperature from Fahrenheit to Celsius and vice versa depending upon user's choice.
2. Program to calculate total marks, percentage and grade of a student. Marks obtained in each of the five subjects are to be input by user. Assign grades according to the following criteria:
 - Grade A: Percentage ≥ 80 Grade B: Percentage ≥ 70 and < 80
 - Grade C: Percentage ≥ 60 and < 70 Grade D: Percentage ≥ 40 and < 60
 - Grade E: Percentage < 40
3. Program, to find the area of rectangle, square, circle and triangle by accepting suitable input parameters from user.
4. Program to display the first n terms of Fibonacci series.
5. Program to find factorial of the given number using recursive function.
6. Write a Python program to count the number of even and odd numbers from array of N numbers.
7. Python function that accepts a string and calculate the number of upper case letters and lower case letters.
8. Python program to reverse a given string and check whether the give string is palindrome or not.
9. Write a program to find sum of all items in a dictionary.
10. Read a file content and copy only the contents at odd lines into a new file.

Course Code	Course Title	L	T	P	C
22120SEC43	JAVA AND DATASTRUCTURES	4	1	0	4

UNIT I

Algorithms, Performance analysis- time complexity and space complexity, Asymptotic Notation-Big Oh, Omega and Theta notations, Complexity Analysis Examples, Data structures-Linear and non linear data structures, ADT concept, Linear List ADT, Array representation, Linked representation, Vector representation, singly linked lists -insertion, deletion, search operations, doubly linked lists-insertion, deletion operations, circular lists. Representation of single, two dimensional arrays, Sparse matrices and their representation.

UNIT II

Stack and Queue ADTs, array and linked list representations, infix to postfix conversion using stack, implementation of recursion, Circular queue-insertion and deletion, Dequeue ADT, array and linked list representations, Priority queue ADT, implementation using Heaps, Insertion into a Max Heap, Deletion from a Max Heap, java.util package-ArrayList, Linked List, Vector classes, Stacks and Queues in java.util, Iterators in java.util.

UNIT III

Searching-Linear and binary search methods, Hashing-Hash functions, Collision Resolution methods-Open Addressing, Chaining, Hashing in java.util-HashMap, HashSet, Hashtable. Sorting -Bubble sort, Insertion sort, Quick sort, Merge sort, Heap sort, Radix sort, comparison of sorting methods.

UNIT IV

Trees- Ordinary and Binary trees terminology, Properties of Binary trees, Binary tree ADT, representations, recursive and non recursive traversals, Java code for traversals, Threaded binary trees. Graphs- Graphs terminology, Graph ADT, representations, graph traversals/search methods-dfs and bfs, Java code for graph traversals, Applications of Graphs-Minimum cost spanning tree using Kruskal's algorithm, Dijkstra's algorithm for Single Source Shortest Path Problem.

UNIT V

Search trees- Binary search tree-Binary search tree ADT, insertion, deletion and searching operations, Balanced search trees, AVL trees-Definition and examples only, Red Black trees - Definition and examples only, B-Trees-definition, insertion and searching operations, Trees in java.util- TreeSet, Tree Map Classes, Tries(examples only), Comparison of Search trees. Text compression-Huffman coding and decoding, Pattern matching-KMP algorithm.

TEXT BOOKS:

1. S. Sahni, "Data structures, Algorithms and Applications in Java", Universities Press. [ISBN:0-07-109217-x]
2. Adam Drozdek, "Data structures and Algorithms in Java", 3rd edition, Cengage Learning. [ISBN:978-9814239233]

Course Code	Course Title	L	T	P	C
22120SEC45L	JAVA AND DATASTRUCTURES LAB	0	0	3	2

1. Write Java programs that use both recursive and non-recursive functions for implementing the following searching methods: a) Linear search b) Binary search
2. Write Java programs to implement the following using arrays and linked lists
a) List ADT
3. Write Java programs to implement the following using an array. a) Stack ADT
b) Queue ADT
4. Write a Java program that reads an infix expression and converts the expression to postfix form. (Use stack ADT).
5. Write a Java program to implement circular queue ADT using an array.
6. Write a Java program that uses both a stack and a queue to test whether the given string is a palindrome or not.
7. Write Java programs to implement the following using a singly linked list. a) Stack ADT b) Queue ADT
8. Write Java programs to implement the deque (double ended queue) ADT using
a) Array b) Singly linked list c) Doubly linked list.
9. Write a Java program to implement priority queue ADT.
10. Write a Java program to perform the following operations: a) Construct a binary search tree of elements. b) Search for a key element in the above binary search tree.

Course Code	Course Title	L	T	P	C
22120DSC54D	SEMANTIC WEB	0	0	3	2

UNIT I

Web Intelligence Thinking and Intelligent Web Applications, The Information Age ,The World Wide Web, Limitations of Today's Web, The Next Generation Web, Machine Intelligence, Artificial Intelligence, Ontology, Inference engines, Software Agents, Berners-Lee www, Semantic Road Map, Logic on the semantic Web.

UNIT II

Knowledge Representation for the Semantic Web Ontologies and their role in the semantic web, Ontologies Languages for the Semantic Web – Resource Description Framework(RDF) / RDF Schema, Ontology Web Language(OWL), UML, XML/XML Schema.

UNIT III

Ontology Engineering, Ontology Engineering, Constructing Ontology, Ontology Development Tools, Ontology Methods, Ontology Sharing and Merging, Ontology Libraries and Ontology Mapping, Logic, Rule and Inference Engines.

UNIT IV

Semantic Web Applications, Services and Technology Semantic Web applications and services, Semantic Search, e-learning, Semantic Bioinformatics, Knowledge Base, XML Based Web Services, Creating an OWL-S Ontology for Web Services, Semantic Search Technology, Web Search Agents and Semantic Methods.

UNIT V

Social Network Analysis and semantic web What is social Networks analysis, development of the social networks analysis, Electronic Sources for Network Analysis – Electronic Discussion networks, Blogs and Online Communities, Web Based Networks. Building Semantic Web Applications with social network features.

Text Books:

1. Thinking on the Web - Berners Lee, Godel and Turing, Wiley inter science, 2008. 1. Social Networks and the Semantic Web, Peter Mika, Springer, 2007.

Reference Books:

1. Semantic Web Technologies, Trends and Research in Ontology Based Systems.

Course Code	Course Title	L	T	P	C
22120SEC61	ADVANCED WEB TECHNOLOGY	4	1	0	4

Unit-1

Introduction to Web Technology: Hypertext Markup Language and its components, HTML tags and attributes, Text formatting tags, List tags, Image tags, HTML tables, HTML Forms, Document Object Model (DOM), Cascading Style Sheets – Inline Style, Embedded Style, External Style Sheet, Imported Style Sheet, Ruleset, @ rule, Contextual Selector, Attribute Selector, CSS Properties, JavaScript - Data types, Operators, Variables, length, substring, Conditional Statements - if, Loops - for, & Functions, HTML DOM and JavaScript - Finding HTML Elements, Changing HTML elements, DOM events.

Unit-2

Events Handlers & Forms in Java Script: Define Events, Events in JavaScripts, EventHandlers, this keyword, Event handlers in JavaScripts, Emulating Events in java scripting, onLoad and onUnload Event Handlers, Web-Hopping with window.open(), Resetting Event Handlers.

Unit-3

Messaging & Timing Events in Java Script: Alert Box: syntax & its example, Confirm Box: syntax & its example, Prompt Box: syntax & its example, Line Breaks: syntax & its example, JavaScript Timing Events, setInterval() Method, window.clearInterval() method, setTimeout() Method, window.clearTimeout() method.

Unit-4

XML and Ajax: XML - Declaration, Root Element, Child Elements, Element Attributes, Entity References, Comments, Ajax – XML HttpRequest Object, Sending Ajax requests, Handling Ajax Responses, Adding Ajax Functionality in JavaScript, Adding Ajax Functionality to a Web Page.

UNIT 5

Web Application Creation: Creating a Web Application – putting it all together, The MVC Design Pattern – Basic Web Architecture, MVC Architecture, Coding Considerations, Setting up our Development Environment, Building our MVC Framework, Building a PHP Application on our MVC framework.

"Web Development with Node and Express: Leveraging the JavaScript Stack"

Text books:

1. Ethan Brown "Web Development with Node and Express: Leveraging the JavaScript Stack" 2nd Edition.

Course Code	Course Title	L	T	P	C
22222DSC17C	Augmented Reality	4	1	0	4

Unit 1: Introduction to Augmented Reality

What is AR? Basic definition and differences between AR and Virtual Reality (VR). **History and Evolution:** How AR has developed over time. **Applications of AR:** Common uses in gaming, education, healthcare, and more. **AR Devices:** Overview of devices such as smartphones, tablets, and AR glasses.

Unit 2: AR Technologies and Tools

Core Technologies: Basics of AR technologies like computer vision, sensors, and tracking. **AR Software Development Kits (SDKs):** Introduction to popular SDKs (e.g., ARKit, ARCore). **3D Modelling and Graphics:** Basics of creating and integrating 3D models in AR. **AR Platforms:** Overview of platforms for building and deploying AR applications.

Unit 3: Designing AR Experiences

User Experience (UX) Design: Principles for creating engaging AR experiences. **Interface Design:** Designing intuitive interfaces for AR applications. **Interaction Design:** Methods for user interaction in AR (e.g., gestures, voice commands). **Content Creation:** Basics of designing and integrating content for AR.

Unit 4: Developing AR Applications

Basic Development Workflow: Steps to build an AR app from scratch. **Programming Basics:** Introduction to languages and frameworks used in AR development (e.g., Unity with C#, JavaScript). **Testing and Debugging:** Techniques for testing AR applications and debugging issues. **Deployment:** How to deploy AR apps to various platforms (e.g., iOS, Android).

Unit 5: Future Trends and Challenges

Emerging Trends: New developments in AR technology (e.g., advanced sensors, improved user interfaces). **Challenges:** Common issues in AR development, such as privacy concerns and technical limitations. **Ethical Considerations:** Impact of AR on privacy, security, and social behaviour. **Career Opportunities:** Exploring career paths and skills needed for a career in AR.

Text books:

1. Dieter Schmalstieg and Tobias Hollerer "Augmented Reality: Principles and Practice" 1st Edition (2016)

Course Code	Course Title	L	T	P	C
22222DSCI7D	Ruby on Rails	4	1	0	4

Unit 1: Introduction to Ruby on Rails

What is Ruby on Rails? Basic introduction and overview of the framework. **Ruby Basics:** Introduction to the Ruby programming language (syntax, variables, control structures). **Rails Architecture:** Overview of Model-View-Controller (MVC) architecture and how Rails uses it. **Setting Up Your Environment:** Installing Ruby, Rails, and necessary tools (e.g., IDEs, databases).

Unit 2: Building Your First Rails Application

Creating a New Rails Project: Using the Rails command-line tools to start a new project. **Rails Conventions:** Understanding Rails conventions (e.g., directory structure, naming conventions). **Generating Resources:** Using Rails generators to create models, views, and controllers. **Running Your Application:** How to start the Rails server and view your application in the browser.

Unit 3: Working with Databases

Active Record Basics: Introduction to Rails' Object-Relational Mapping (ORM) system, Active Record. **Migrations:** Creating and running database migrations to modify the database schema. **CRUD Operations:** Implementing Create, Read, Update, and Delete functionalities in your models. **Validations and Associations:** Adding validations and setting up associations between models (e.g., one-to-many, many-to-many).

Unit 4: Creating and Managing Views **Rails Views:** Understanding how to create and use views in Rails. **Layouts and Partials:** Using layouts for common design elements and partials to reuse code. **Forms:** Building and handling forms for user input and submissions. **View Helpers:** Utilizing Rails view helpers to simplify common tasks (e.g., form helpers, URL helpers).

Unit 5: Advanced Features and Deployment

Testing: Introduction to testing in Rails using tools like RSpec or MiniTest. **Authentication:** Implementing basic user authentication and authorization (e.g., using Devise gem). **Deploying Your Application:** Basics of deploying a Rails app to a cloud service (e.g., Heroku). **Performance and Optimization:** Tips for improving the performance of your Rails application.

Text books: Obie Fernandez "The Rails 5 Way" 1st Edition (2017)

Obie Fernandez "Rails 4 Way" 1st Edition (2014)

Course Code	Course Title	L	T	P	C
22222DSC17E	Soft Computing Techniques	4	1	0	4

Unit 1: Introduction to Soft Computing

Overview: What is soft computing and how it differs from traditional computing? **Key Techniques:** Introduction to major techniques (Neural Networks, Fuzzy Logic, Genetic Algorithms). **Applications:** Where soft computing is used in real-world problems.

Unit 2: Neural Networks Basics: Introduction to neural networks and their components (neurons, layers). **Training:** How neural networks learn (e.g., back propagation). **Types:** Overview of different types (e.g., Feed forward Neural Networks, Convolutional Neural Networks).

Unit 3: Fuzzy Logic

Basics: Introduction to fuzzy logic and how it differs from classical logic. **Fuzzy Sets:** Understanding membership functions and fuzzy sets. **Fuzzy Inference:** How fuzzy rules and inference systems work for decision-making.

Unit 4: Genetic Algorithms

Concepts: Basic principles (selection, crossover, mutation). **Application:** Simple examples of optimization problems solved by genetic algorithms. **Implementation:** Basic steps to implement a genetic algorithm.

Unit 5: Hybrid and Advanced Topics

Hybrid Systems: Combining neural networks, fuzzy logic, and genetic algorithms for complex problems. **Applications:** Real-world examples and case studies. **Future Trends:** Emerging trends and future directions in soft computing.

Text books:

1. S. N. Sivanandam, S. N. Deepa "Soft Computing: Fundamentals and Applications" 1st Edition (2006)
2. K. S. Rajasekaran, G. A. Vijayalakshmi Pai "Soft Computing and Intelligent Systems Design: Theory, Tools and Applications" 1st Edition (2003)

Course Code	Course Title	L	T	P	C
22222DSC17F	Quantum information and computation	4	1	0	4

Unit 1: Introduction to Quantum Mechanics

Fundamentals of Quantum Mechanics

Qubits and quantum states Superposition and entanglement **Quantum Measurement:** Measurement postulates, Quantum state collapse

Unit 2: Quantum Gates and Circuits

Basic Quantum Gates

Pauli-X, Y, Z gates, Hadamard gate, CNOT gate. **Quantum Circuits:** Building and analysing quantum circuits, Quantum circuit diagrams

Unit 3: Quantum Algorithms

Gröver's Search Algorithm: Problem statement and solution, Algorithm steps and efficiency **Shor's Factoring Algorithm:** Problem statement and solution, Algorithm steps and implications for cryptography

Unit 4: Quantum Error Correction

Types of Quantum Errors

Bit-flip, phase-flip, and depolarizing errors. **Error Correction Techniques:** Simple error-correcting codes (e.g., 3-qubit repetition code), Introduction to more advanced methods

Unit 5: Applications and Current Research

Quantum Cryptography: Quantum key distribution (e.g., BB84 protocol), Applications in secure communication **Future Directions:** Overview of emerging technologies, Current challenges and research trends in quantum computing

Textbook:

1. Michael A. Nielsen and Isaac L. Chuang b "Quantum Computation and Quantum Information" 10th Anniversary Edition (2010)
2. John Preskil "Quantum Computation and Quantum Information Theory" 1st Edition (2004)

Course Code	Course Title	L	T	P	C
22222DSC27D	Haskell programming	4	1	0	4

Unit 1: Introduction to Haskell

Basic Concepts: What is Haskell? Overview of functional programming. Installing and setting up Haskell. **Basic Syntax and Data Types,** Haskell syntax, comments, and basic operations. Primitive data types (e.g., int, Float, Bool, Char).

Unit 2: Functions and Lists

Defining Functions: Function syntax, definitions, and simple recursion. Higher-order functions and lambda expressions. **Lists and List Operations:** Basic list operations (e.g., head, tail, map, filter), List comprehensions and pattern matching.

Unit 3: Types and Type Classes

Custom Data Types: Defining and using custom types (e.g., `data`, `newtype`), Algebraic data types (ADTs) and pattern matching. **Type Classes:** Understanding and creating type classes, using common type classes (e.g., `Eq`, `Ord`, `Functor`).

Unit 4: Monads and IO

Understanding Monads: Introduction to monads and their uses. Common monads (e.g., `Maybe`, `IO`). **Input/Output Operations:** Basic IO operations and handling user input. File operations and dealing with IO actions.

Unit 5: Advanced Topics and Libraries

Advanced Functional Concepts: Lazy evaluation and infinite data structures, Understanding recursion schemes and higher-kinded types. **Using Libraries and Tools:** Introduction to common Haskell libraries (e.g., `text`, `containers`), Managing projects with Cabal or Stack.

Textbook:

1. Christopher Allen and Julie Moronuki "Haskell Programming from First Principles" 1st Edition (2016)
2. Miran Lipovača "Learn You a Haskell for Great Good!" 2nd Edition (2011)

Course Code	Course Title	L	T	P	C
22222DSC27E	Natural Language Processing	4	1	0	4

Unit 1: Introduction to NLP

Overview of NLP: What is NLP? Key concepts and applications, Basic text processing (tokenization, normalization, stop words removal).

Unit 2: Text Representation

Vectorizing Text: Bag-of-Words (Bow) model, Term Frequency-Inverse Document Frequency (TF-IDF). Introduction to word embedding's (Word2Vec, Glove).

Unit 3: Language Models and Text Classification

Language Models: Basics of language models (N-grams). Introduction to neural language models (RNNs, LSTMs). **Text Classification:** Classification algorithms (e.g., Naive Bayes, SVM). Evaluation metrics (accuracy, precision, recall).

Unit 4: Sequence Modelling and Named Entity Recognition

Sequence Modelling: Recurrent Neural Networks (RNNs). Introduction to Transformers and Attention Mechanism. **Named Entity Recognition (NER):** Concepts and techniques for identifying named entities in text.

Unit 5: Advanced Topics and Applications

Advanced Models: Pre-trained models (e.g., BERT, GPT). Transfer learning and fine-tuning. **Applications:** Practical applications (chat bots, sentiment analysis). Ethical considerations and challenges.

Textbook:

1. "Natural Language Processing with Python: Analyzing Text with the Natural Language Toolkit" by Steven Bird, Ewan Klein, and Edward Loper. 2nd edition, published in 2009.

Course Code	Course Title	L	T	P	C
22222DSC27F	Artificial Neural Network	4	1	0	4

Unit 1: Basics of NLP and AI

Introduction to NLP: What is Natural Language Processing? Key applications (e.g., chat bots, translation). **Introduction to AI:** Basics of Artificial Intelligence, Relationship between AI and NLP.

Unit 2: Text Processing and Representation

Text Pre-processing: Tokenization, stemming, and lemmatization, Removing stop words and normalization. **Text Representation:** Bag-of-Words (BoW) and TF-IDF, Introduction to word embedding's (Word2Vec, GloVe).

Unit 3: Machine Learning Models for NLP

Supervised Learning for NLP: Basic algorithms (Naive Bayes, Logistic Regression), Model evaluation (accuracy, precision, recall). **Introduction to Neural Networks:** Basics of Neural Networks and Deep Learning, Recurrent Neural Networks (RNNs) and Long Short-Term Memory (LSTM) networks.

Unit 4: Advanced NLP Techniques

Transformers and Attention: Introduction to Transformer models (e.g., BERT, GPT). Understanding the Attention Mechanism. **Sequence Models:** Applications of sequence models in NLP (e.g., machine translation).

Unit 5: Practical Applications and Future Trends

Applications of NLP: Practical examples (sentiment analysis, named entity recognition). Building and deploying NLP applications (chat bots, information retrieval). **Future Trends and Challenges:** Current research trends and emerging technologies. Ethical considerations in NLP and AI.

Textbook:

2. "Deep Learning" by Ian Goodfellow, Yoshua Bengio, and Aaron Courville. 1st edition, published in 2016

Course Code	Course Title	L	T	P	C
22222DSC36D	Software forensics	4	1	0	4

Unit 1: Introduction to Software Forensics

Overview of Software Forensics: What is software forensics? Importance and applications. Key concepts and principles. **Legal and Ethical Considerations:** Legal frameworks and guidelines. Ethical issues and professional responsibilities.

Unit 2: Digital Evidence Collection

Evidence Gathering: Methods for collecting digital evidence (e.g., logs, files). Ensuring evidence integrity (hash functions, chain of custody). **Tools and Techniques:** Introduction to common forensic tools (e.g., Encase, FTK). Techniques for data acquisition and preservation.

Unit 3: Analysing Software Artifacts

Static Analysis: Examining source code and binary files without execution. Techniques for reverse engineering (e.g., disassembly, DE compilation). **Dynamic Analysis:** Analysing software behaviour during execution. Techniques for monitoring and debugging.

Unit 4: Malware Analysis

Malware Fundamentals: Types of malware (viruses, worms, Trojans). Common techniques used by malware. **Malware Investigation:** Tools and methods for analysing and dissecting malware. Identifying and understanding malware functionality and impact.

Unit 5: Reporting and Presentation

Documenting Findings: Writing forensic reports (structure, content, clarity). Presenting evidence and findings effectively. **Case Studies and Practice:** Reviewing real-world case studies. Practical exercises and scenarios to apply forensic skills.

Textbook:

3. "Software Forensics: An Introduction to the Investigation and Analysis of Software"
Richard W. M. Van Wyk 1st Edition (2014)

Course Code	Course Title	L	T	P	C
22222DSC36E	Information system management	4	1	0	4

Unit 1: Introduction to Information Systems

Basics of Information Systems: What are Information Systems? Components and functions. Types of information systems (e.g., ERP, CRM, MIS). **Role in Business:** How information systems support business operations and decision-making.

Unit 2: Information Systems Planning and Development

Systems Development Life Cycle (SDLC): Key phases: Planning, Analysis, Design, Implementation, Maintenance. **Project Management:** Basic project management concepts (e.g., scope, time, cost management).

Unit 3: IT Infrastructure and Networking

IT Infrastructure: Components: hardware, software, networks, and data centres. Basics of cloud computing and virtualization. **Networking Basics:** Network types (LAN, WAN) and protocols. Introduction to network security measures.

Unit 4: Data Management and Security

Data Management: Introduction to databases and data management systems (DBMS). Basics of data governance and data quality. **Information Security:** Fundamental concepts (e.g., encryption, access controls). Key practices for protecting information systems.

Unit 5: Strategic Management and Emerging Trends

Strategic Alignment: Aligning IT strategy with business goals, Managing IT investments and evaluating performance. **Emerging Trends:** Overview of new technologies (e.g., AI, big data). Impact of these technologies on business and information systems.

Textbook:

"Information Systems Management in Practice"

Authors: Gary A. Davis, & William H. Newton

Edition: 9th Edition (2016)

Course Code	Course Title	L	T	P	C
22222DSC36F	Social Media Mining	4	1	0	4

Unit 1: Introduction to Social Media Mining

Overview of Social Media Mining: What is social media mining? Key concepts and goals, Types of social media data (e.g., text, images, videos). **Applications and Use Cases:** Common applications (e.g., sentiment analysis, trend detection).

Unit 2: Data Collection and Pre-processing

Data Collection: Methods for collecting social media data (e.g., APIs, web scraping). Tools and platforms for data collection (e.g., Twitter API, Facebook Graph API). **Data Pre-processing:** Text pre-processing (e.g., tokenization, stop word removal), Handling missing or noisy data.

Unit 3: Text Analysis and Sentiment Analysis

Text Analysis: Techniques for analysing text data (e.g., topic modelling, keyword extraction), Introduction to Natural Language Processing (NLP) in the context of social media. **Sentiment Analysis:** Methods for sentiment classification (e.g., positive, negative, neutral). Tools and libraries for sentiment analysis (e.g., VADER, Text Blob).

Unit 4: Network Analysis and Community Detection

Network Analysis: Basics of social network analysis (nodes, edges), Metrics and visualization techniques (e.g., centrality, clustering). **Community Detection:** Techniques for identifying communities or groups within social networks. Algorithms and methods (e.g., modularity, Louvain method).

Unit 5: Applications and Ethical Considerations

Applications of Social Media Mining: Case studies and real-world applications (e.g., brand monitoring, crisis management). Building and deploying social media mining solutions. **Ethical and Privacy Issues:** Ethical considerations in social media mining (e.g., privacy concerns, data consent), Legal and regulatory aspects.

Textbook:

"Information Systems Management: A Practical Approach"

Author: Gary A. Davis

Edition: 8th Edition (2014)

Course Code	Course Title	L	T	P	C
22222DSC44B	Computer Ethics	4	1	0	4

Unit 1: Introduction to Computer Ethics

Overview of Computer Ethics: What is computer ethics? Importance and scope, Key ethical principles and theories (e.g., utilitarianism, deontology). **Ethical Issues in Computing:** Common ethical dilemmas in technology and computing.

Unit 2: Privacy and Data Protection

Privacy Concerns: Definition and importance of privacy in the digital age. Types of personal data and privacy risks. **Data Protection Laws:** Overview of key regulations (e.g., GDPR, CCPA). Best practices for protecting personal data.

Unit 3: Intellectual Property and Digital Rights

Intellectual Property Basics: Copyright, patents, and trademarks in the digital context. Software licensing (e.g., open source vs. proprietary). **Digital Rights:** Issues related to digital rights management (DRM) and fair use.

Unit 4: Cyber security and Ethical Hacking

Cyber security Fundamentals: Key concepts in cyber security (e.g., encryption, access control). Ethical considerations in cyber security practices. **Ethical Hacking:** Definition and role of ethical hacking (e.g., penetration testing). Legal and ethical boundaries for hackers.

Unit 5: Social Impact and Professional Responsibilities

Social Impact of Technology: How technology affects society (e.g., automation, digital divide). Ethical implications of technological advancements. **Professional Responsibilities:** Codes of ethics for IT professionals (e.g., ACM Code of Ethics). Building ethical practices into technology development and use.

Textbook:

"Computer Ethics: A Case-Based Approach"

Author: Richard A. Spinello

Edition: 4th Edition (2017)

Course Code	Course Title	L	T	P	C
22222DSC44C	Web Mining	4	1	0	4

Unit 1: Introduction to Web Mining

Overview of Web Mining: What is web mining? Definition and goals, Types of web mining (web content mining, web structure mining, and web usage mining). **Applications of Web Mining:** Common applications (e.g., search engines, recommendation systems).

Unit 2: Data Collection and Pre-processing

Web Data Collection: Methods for collecting web data (e.g., web scraping, crawling), Tools and techniques for data extraction (e.g., BeautifulSoup, Scrapy). **Data Pre-processing:** Cleaning and preparing web data (e.g., handling missing data, normalization), Techniques for text pre-processing (e.g., tokenization, stop word removal).

Unit 3: Web Content Mining

Text Mining Techniques: Analysing and extracting useful information from web content, Methods for text classification and clustering. **Sentiment Analysis:** Techniques for understanding sentiment in web data (e.g., sentiment scoring).

Unit 4: Web Structure Mining

Understanding Web Structure: Concepts of web graph analysis (e.g., nodes, edges, link analysis). Importance of web structure in mining. **Algorithms and Techniques:** PageRank and HITS algorithms for analysing web links. Community detection and clustering in web graphs.

Unit 5: Web Usage Mining and Applications

Web Usage Mining: Techniques for analysing web usage data (e.g., clickstream analysis). Extracting patterns and user behaviour insights. **Applications and Ethical Considerations:** Applications of web mining (e.g., personalized recommendations, targeted advertising), Ethical issues in web mining (e.g., privacy concerns, data consent).

Textbook:

"Web Mining: Applications and Techniques"

Authors: Soumen Chakrabarti

Edition: 1st Edition (2002)

Course Code	Course Title	L	T	P	C
22222DSC44E	Graphics and computer vision	4	1	0	4

Unit 1: Introduction to Computer Graphics

Basics of Computer Graphics: What is computer graphics? Key concepts and applications, Graphics pipelines and rendering processes.**2D Graphics:** Drawing shapes, lines, and text, Basic transformations (scaling, rotation, translation).

Unit 2: 3D Graphics and Modelling

3D Graphics Fundamentals: Introduction to 3D graphics (vertices, edges, faces). Camera models and perspectives.**3D Modelling:** Creating and manipulating 3D models. Basic techniques (e.g., extrusion, subdivision).

Unit 3: Computer Vision Basics

Introduction to Computer Vision: What is computer vision? Key concepts and goals, Basic image processing techniques (e.g., filtering, edge detection).**Feature Detection and Matching:** Techniques for detecting and matching features in images (e.g., SIFT, SURF).

Unit 4: Advanced Computer Vision Techniques

Object Recognition: Techniques for object detection and recognition (e.g., Haar cascades, HOG features), Introduction to deep learning for object recognition (e.g., CNNs).**Image Segmentation** Methods for segmenting images into regions (e.g., thresholding, clustering).

Unit 5: Applications and Integration

Applications of Graphics and Vision: Real-world applications (e.g., augmented reality, autonomous vehicles).**Integration of graphics and computer vision in applications.** **Current Trends and Future Directions:** Emerging technologies and research areas in graphics and computer vision.

Textbook:

1. "Computer Graphics: Principles and Practice"
Authors: John F. Hughes, Andries van Dam, Morgan McGuire, David FinkelHALT, Kurt Akeley, and others 4th Edition (2019)

Course Code	Course Title	L	T	P	C
22222DSC44F	Agile framework	4	1	0	4

Unit 1: Introduction to Agile Frameworks

What is Agile ?: Overview of Agile principles and values. Key differences between Agile and traditional project management (Waterfall). **Agile Manifesto:** The 12 principles of Agile, The four core values of Agile.

Unit 2: Scrum Framework

Basics of Scrum: Scrum roles: Product Owner, Scrum Master, and Development Team, Scrum artifacts: Product Backlog, Sprint Backlog, Increment. **Scrum Events:**Key events: Sprint, Sprint Planning, Daily Scrum, Sprint Review, Sprint Retrospective.

Unit 3: Kanban Method

Overview of Kanban: Principles and practices of Kanban. Key concepts: Kanban board, Work In Progress (WIP) limits, **Implementing Kanban:** Visualizing workflow and managing work items. Continuous improvement and flow optimization.

Unit 4: Other Agile Frameworks

Extreme Programming (XP): Key practices of XP (e.g., pair programming, test-driven development). **Lean Software Development:** Principles of Lean and its application in software development. **Feature-Driven Development (FDD):** Overview of FDD and its process.

Unit 5: Agile Implementation and Best Practices

Adopting Agile: Steps for implementing Agile in an organization. Common challenges and strategies for overcoming them. **Continuous Improvement:** Techniques for ongoing improvement in Agile practices, Metrics and feedback loops for Agile teams.

Textbook:

"Agile Estimating and Planning"

Author: Mike Cohn

Edition: 1st Edition (2005)

VALUE ADDED COURSE SYLLABUS 2022-2023

COURSE: Diploma in Web Application development and hosting

SUBJECT CODE: 21DPWP123

MODULE -1

Basics of Web Designing - Multimedia and its Applications - Web Technologies - Introduction to Web Design & Applications - Computer Graphics - Mathematical Structure for Computer Science

HTML

CSS

JavaScript

Bootstrap

MODULE -2

Adobe Dreamweaver - Adobe Flash - Available Software for Graphic Designing - Animation Techniques - Web Hosting Basics - Types of Hosting Packages - Registering domains - Defining Name Servers

Using Control Panel - Creating Emails in C panel - Using FTP Client - Maintaining a Website

MODULE -3

HTML5 Elements and Semantics - CSS3 Advanced Styling Techniques - Responsive Design and Media Queries - JavaScript Fundamentals - JavaScript Syntax and Operators - DOM Manipulation and Event Handling - Asynchronous JavaScript (Promises, Async/Await)

MODULE -4

Server-Side Scripting - Introduction to Node.js and Express.js (or other server-side languages/frameworks) - RESTful API Design and Implementation - Handling HTTP Requests and Responses - Databases - Introduction to Databases (SQL vs. NoSQL) - CRUD Operations with SQL (e.g., MySQL, PostgreSQL) - Working with NoSQL Databases (e.g., MongoDB)

MODULE -5

User Authentication (e.g., OAuth, JWT) - Role-Based Access Control - Security Best Practices - Full-Stack Development - Integrating Front-End and Back-End - Connecting Front-End to Back-End APIs - Handling Form Submissions and Data Processing - Error Handling and Validation



Academic year: 2022-2023

Course: Designing [Photoshop, Premium, Illustrator]

Subject Code: 22CC01

Aim:

To learn the image creation, graphic design and photo editing software developed by Adobe

Objectives:

- Navigate the Photoshop interface.
- Perform basic photo retouching tasks.
- Understand how to work with layers.
- Use effects and filters.
- Combine two separate images into one.
- Understand image resolution and file output for print and web graphics.

UNIT-1

Getting Started, Photo Retouching ,Cropping Photos Creating Graphics: Combining Photos, Text, &Graphics

UNIT-2

Replacing Backgrounds - Blend Modes & Opacity Color Correction Using color Balance - Color Correction Using Curves.

Working with Digital Photos for Print / Exporting Files for Web Digital

UNIT-3

Sharpening Photos - Use Layer Fill & Drop to Smart Filters Layer Masking - Masking Smart Filters

UNIT-4

Converting to Black & White & Lens Correction Placing Your Design in Pre-made Mockups Adjustment Layers & Masks - Retouching

UNIT-5

Cloning Color With a Blending Mode, Clipping Masks: Filling Shapes with Images Using Adjustment Layers as Clipping Masks Camera Raw Fundamentals ,Camera Raw as a Filter

COURSE OUTCOMES:

- Appreciate the importance of visualization in the data analytics solution
- Apply structured thinking to unstructured problems Understand a very broad collection of machine learning algorithms and problems
- Learn algorithmic topics of machine learning and mathematically deep enough to introduce the required theory Develop an appreciation for what is involved in learning from data.

REFERENCE:

- Adobe Photoshop CS6 on Demand
- Adobe Photoshop 7.0 Classroom in a Book

HOD

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Ponnalyah Ramalayam Institute of
Science and Technology (PRIST)



Course: Certificate Course On Google IT Support
Subject Code: 22CC05

Aim:

- To learn the basics of Google IT Support is all about troubleshooting and problem solving, and providing great customer service along the way.

Course objective:

- To know the fundamental concepts of Google IT Support
- To study various analytics on stream data.

Unit 1:

Technical Support Fundamentals- Offered by Google. This course is the first of a series that aims to prepare you for a role as an entry-level IT Support Specialist.

Unit 2:

The Bits and Bytes of Computer Networking- Offered by Google. This course is designed to provide a full overview of computer networking. We'll cover everything from the fundamentals.

Unit 3:

Operating Systems and You: Becoming a Power User- Offered by Google. In this course -- through a combination of video lectures, demonstrations, and hands-on practice.

Unit 4:

System administration and IT Infrastructure Services- Offered by Google. This course will transition you from working on a single computer to an entire fleet. System administration is the field.

Unit 5:

IT Security: Defense against the digital dark arts- Offered by Google. This course covers a wide variety of IT security concepts, tools, and best practices. It introduces threats and attacks.

COURSE OUTCOMES

- -Appreciate the importance of visualization in the data analytics solution
- -Apply structured thinking to unstructured problems Understand a very broad collection of machine learning algorithms and problems
- -Learn algorithmic topics of machine learning and mathematically deep enough to introduce the required theory Develop an appreciation for what is involved in learning from data.

REFERENCE BOOKS

The IT Support Handbook- A How-To Guide to Providing Effective Help and Support to IT Users

2013
Department of Computer Science
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Tripplavur - 613 403

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Course: Diploma course on Graphical Programming[Flash, Swish]
Subject Code: 22DIP03

Aim:

To learn the basics of Web Designing & Hosting. To introduce students with fundamental concepts and theory of computer graphics. It presents the important drawing algorithm, polygon fitting, clipping and 2D transformation curves and an introduction to 3D transformation.

Objectives:

Unit-1

Flash Syllabus Introduction To Flash Object based animation Motion Tween Presets File menu Edit menu View menu Insert menu Modify menu Text menu Commands menu Control menu Debug menu Windows menu Help menu

Unit-2

Tools of Flash Free Transform tool Lasso tool Pen tool Pencil tool Eye Dropper tool Hand tool 3D Rotation and Text tool Rectangle tool Brush tool Palm Brush tool Eraser tool Magnifier tool Working with Text in Flash Creating Text with Text box and Paragraph text wrapping. Text to Path Editing Text Drawing Objects in Flash Drawing Text Drawing a Custom Line Drawing Curves with the pen tool Drawing Oval shapes Filling Objects in Flash Editing the fill colour Adding strokes to shapes Rotation of Objects Using the Eraser tool Creating Gradient tool.

Unit-3

Adjusting Colour Intensity Grouping Object Creating and Editing Art works in Flash Vector Graphics and Bitmap Graphics Paths Drawing Modes and Graphics Objects Reshape line and shape Transforming Object Combining Object Arranging Object Snapping an into position ColorPlates 3D Graphics Working with Layers in Flash Adding a layer and Deleting working with layer in the timeline Adding the stacking order Adding Classic Motion guide layer Adding a plain guide layer Adding a mask layer Working with Animation in Flash .

Unit-4

PHOTO SHOP Introduction to Photoshop Introduction What's new in Photoshop Adjustment panel Masks panel Advanced compositing Canvas rotation Smoother panning and zooming Better raw processing in camera Raw Improved light room work flow Powerful printing option 3d acceleration Compressive 3d tools High performance on very large images . Menu commands in Photoshop Using the start menu Using shortcut Menu command Edit menu File menu Image menu Layer menu Select menu Filter menu Analysis menu 3D menu.



Unit-5

Web coding – html div (css)-css advance dream weaver java script java script advance j-query

COURSE OUTCOMES:

At the end of the course the student will learn basic concepts of 2D Animation, Storyboarding and create animated digital multimedia content for media using the tools and techniques as available in the Adobe Flash software and swish.

REFERANCE

Multimedia Computing, Communications and Applications

By Ralf Steinmetz, Klara Nahrstedt - 2012

Multimedia Communications: Applications, Networks, Protocols And Standards

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Course: Certificate Course On Introduction To Cyber Security Tools And Cyber Attacks
Subject Code: 22CC06

Aim:

To learn the basics of Introduction to Cyber Security Tools and Cyber Attacks.

Course objective:

- To know the fundamental concepts of Introduction to Cyber Security Tools and Cyber Attacks
- To study various analytics on stream data.

UNIT-1

• Introduction to cyber security • Cybercrime and different modes of attacks • Intrusion detection system

UNIT-2

• It assets and wireless security • Cyber security assurance framework • Desktop security and malware

UNIT-3

• E-commerce and web-application security • Social engineering • Cyber security risk management

UNIT-4

• Cloud security • Security management • Security audit and risk management • Security assessment & frameworks • Information security governance • Security controls • Security control design • Software development lifecycle (SDLC)

UNIT-5

• Authentication and password security • Wireless security • Investigative and digital forensic • Introduction to cryptography

COURSE OUTCOMES:

Design effective data visualizations in order to provide new insights into a communicate information to the viewer.

Find and select appropriate data that can be used in order to create a visualization that answers a particular question

Understand how Cultures of Practice influence the way data may be collected, described, or formatted in order to align their own data management practices with those of their discipline

REFERENCE BOOKS

Introduction to Cyber Warfare A Multidisciplinary Approach By Paulo Shakarian, Jana Shakarian, Andrew Beyer - 2013
 HOD
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 Valiam, Thanjavur-611 003.



COURSE: Certificate Course On Network Simulator
SUBJECT CODE:22CC07

Aim:

To learn the basics of Network Simulator using a network simulator is a software program that can predict the performance of a computer network or a wireless communication network.

Objectives:

A network simulator is a software program that can predict the performance of a computer network or a wireless communication network.

Unit 1:

Simulation of Computer Networks: Computer Networks and the Layering Concept- System Modelling- Basics of Computer Network Simulation- Time-Dependent Simulation ..A Simulation Example: A Single-Channel Queuing System

Unit 2:

Introduction to Network Simulator 2 (NS2)- Installation - Directories and Convention .. Running NS2 Simulation- A Simulation Example- Including C++ Modules into NS2 and the make Utility ..

Unit 3:

Implementation of Discrete-Event Simulation in NS2- NS2 Simulation Concept - Events and Handlers- The Scheduler- The Simulator

Unit 4:

Developing New Modules for NS2- Automatic Report Generation - Packet Scheduling for Multi-Flow Data Transmissions

Unit 5:

Post simulation Processing: Debugging, Tracing, and Result Compilation- Debugging: A Process to Remove Programming Errors , Variable Tracing .. Packet Tracing

COURSE OUTCOMES:

1. Develop effective presentation of business analyses, research, and recommendations through written forms of communication with specificity and appropriate to the intended audience

2. Develop effective presentation of business analyses, research, and recommendations through oral communication of conventions and forms with specificity and appropriate to the intended audience.

REFERENCE BOOKS

1. Introduction to Network Simulator NS2 By Tegrawati Saryakul, Ekram Hossain - 2008


2. How to Write a Perfect Network Simulator - 3 Program (NS - 3) NS - 3 Workshop Manual for All. By Na Vikraman - 2019


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Vilath, Thanjavur - 613 403

SIGNATURE OF THE MEMBERS PRESENT

S.No.	NAME OF THE MEMBERS	SIGNATURE
1.	Dr.K.T.Senthil Kumar	
2.	Dr.K.Mohan Kumar	
3.	Mr.S.Karthikeyan	
4.	Dr.K.Saravanan	
5.	Dr.R.Maruthi	
6.	Dr.G.Preethi	
7.	Mrs.M.Aarthi	
8.	Mrs.R.Suganya	
9.	Mr.D.S.ChozhaBharathi	
10.	Mr.K.Vijayabaskar	


PRIST Deemed to be University
Thanjavur - 613 403, Tamilnadu.


Dean of Arts & Science
PRIST Deemed to be University
Thanjavur - 613 403, Tamilnadu.



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SCHOOL OF ARTS AND SCIENCE
 DEPARTMENT OF BIOCHEMISTRY
 BOARD OF STUDIES COMMITTEE MEETING
CIRCULAR

Date: 28.04.2022

There will be a Board of Studies Meeting on 04.05.2020 at 12.30 am in CRD Block, PRIST University, Thanjavur. All the staff members are requested to attend the meeting.

Agenda:

- Curriculum
- Feedback

[Handwritten Signature]
Dean 05/4/22
 (DR.L.Chinnappa)

Signature

- DR. Bakrudeen Ali Ahamed
- DR.A.Solna Chandra Packiavathi
- Dr.S.Ambiga
- DR.S.Sathishkumar
- MR.R.Viswalingam

[Handwritten Signatures and Dates]
 23/04/22

Dr. L. CHINNAPPA
 M.Sc. M.Phil. M.Ed. PGDCA, PGDCA, U.Tech, Ph.D.
 PROFESSOR OF PHYSICS,
 PRIST UNIVERSITY,
 VALLAM, THANJAVUR-613 403.



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SCHOOL OF ARTS AND SCIENCE
DEPARTMENT OF BIOCHEMISTRY

Composition of Board of Studies 2022-2023

	Designation	Name	Qualification	Designation & Affiliation	Mail id
1	Chairperson/HoD	DR. BAKRUDEEN ALI	M.Sc., Ph.D.,	Head & Professor Department of Biochemistry, School of Arts and Science, PRIST Deemed to be University, Thanjavur	bakru24@gmail.com *
2	External Expert- Academic	DR. K. JEYAPRAKASH	M.Sc., M. Phil, Ph.D., PGDCA.,	Head & Asst Professor Department of Biochemistry, Rajah Serfoji Government college (Autonomous), (Affiliated to Bharathidasan University, Tiruchirappalli), Thanjavur-613005, Mobile: 9894769294	Email: jpsrjgo@gmail.com
3	External Expert- Industry	Dr.R.SUKIRTHA	Ph.D	Research Director, Ashwanth Diagnostics and Research Centre, No 7, Railar Nsgar, Madurai 625017, Tamil nadu, 9047044901	adr1820@gmail.com
4	Professor	DR.A.SOHNA	M.Sc., M. Phil,	Professor Department of Biochemistry, School of	

	CHANDRA PACKIAVATHI	Ph.D.,	Arts and Science, PRIST Deemed to be University, Thanjavur
5	Associate Professor Dr.S.AMBIGA	M.Sc , M. Phil, Ph.D.,	Associate Professor Department of Biochemistry, School of Arts and Science, PRIST Deemed to be University, Thanjavur ambigabio@gmail.com
6	Assistant Professor DR.S.SATHISHKUMAR	M.Sc , M. Phil, Ph.D.,	Professor Department of Biochemistry, School of Arts and Science, PRIST Deemed to be University, Thanjavur drsathishbiochem@gmail.com
7	Assistant Professor MR.R.VISWALINGAM	M.Sc , M. Phil,	Assistant Professor Department of Biochemistry, School of Arts and Science, PRIST Deemed to be University, Thanjavur rviswalingamtiens@gmail.com
8	Special Invitee-Dean Dr.L.Chinnappa	M.Sc , M. Phil, Ph.D., PGDCA.,	Dean, School of Arts and Science, PRIST Deemed to be University, Thanjavur artsnaac2020@gmail.com
9	Special Invitee- Alumnus/Alumna	BSC	I MSC BIOCHEMISTRY, SASTRA UNIVERSITY, KUMBakonam vijunelawrence@gmail.com
10	Special Invitee - Current student - UG or PG	BSC	II Msc Biochemistry anbumurali2@gmail.com


Dr. A. BAKRUDEEN ALI AHMED
 Associate Professor, Dept. of Bio Chemistry
 Center for Research & Development (CRD)
 PRIST Deemed University, Thanjavur-613 008
 Email: bakrudeen@prist.ac.in


Dr. L. CHINNAPPA
 M.Sc.,M.Phil.,PGDCA.,PGDRA.,M.Tech.,Ph.D.
 Dean of Arts & Science
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Ponnayyah Ramajayam Institute of Science and Technology
 PRIST Deemed to be University
 School of Arts & Science
 Department of ~~BIOCHEMISTRY~~
Minutes of the meeting of the Board of Studies (BoS)*

Date: 4/5/22
 Venue: Seminar Hall, CRD
 Time: 12:30 pm

Members present:

Chair: (Name/Degree/Designation/Dept./PRIST) **Dr. A. Bakrudeen Ali Ahmed, Professor & head Department of Biochemistry, school of Arts & science PRIST Deemed to be University, Thanjavur.**

External Members

S.No.	Name/Degree/Designation	Institute/Organization/Full address	Online/Physical	Signature (scan, if online)
1	Dr. K. Jayapalan	Rajah murgaji, horticulture		[Signature]
2	Dr. P. Sakthi / Researcher	ASCC, Startup, Madurai	Startup	[Signature]
...				

Internal Members

S.No.	Name/Degree/Designation	Department	Online/Physical	Signature (scan, if online)
1	Dr. Bakrudeen Ahmed	Biochemistry	Physical	
2	Dr. A. John Chandra	Biochemistry	physical	[Signature]
3	Dr. S. Ambiga	Biochemistry	physical	[Signature]
4	Dr. S. Sathishkumar	Biochemistry	physical	[Signature]
5	Dr. Viswalingam	Biochemistry	Physical	[Signature]

Invited Participants

S.No.	Name/Degree/Designation	Department/Class Institute/Organization/Address	Online/Physical	Signature (scan, if online)
1	L. VIVIANE LAURENCE	M.Sc Biochemistry, JASSOA	Physical	[Signature]
2	S. AMARESAN	ASCC prof, Computer science	Physical	[Signature]
3	Dr. J. S. Nihal Rau	Asst Prof Head, Chemistry	Physical	[Signature]

Agenda

1. Confirmation of the previous Meeting Minutes
2. Action taken on the previous Meeting Minutes.
3. To scrutinize the stakeholder Feedbacks on UG, PG curriculum.
4. To consider the inclusion of audit course in the curriculum
5. To consider the introduction of employment oriented add on course
6. To recommend the panel of examiners for BSc, MSc
7. Any other matter.

Contd.....

Department of Biochemistry
Minutes of the Board of Studies

The Board of Studies meeting was held on 04.05.2022. The Chairman Dr. A.Bakrudeen Ali Ahmed welcomed the members of the Board of studies and outlined the changes to be made in the following for the board approval.

Item 1. To consider changes in the Curriculum and Syllabi of Bsc, Msc Biochemistry, course and approval.

Item 2. To suggest the panel of names for appointment of examiners.

Item 3. Other academic activities in the department.

As per the suggestions and recommendations given by the Stakeholders on the above items discussed, the existing/revised Scheme of Curriculum/Scheme of Examination syllabi and Panel of Examiners is to be followed is annexed herewith for the implementation from the commencement of the Academic year 2020-2021. The Regulations and Syllabus for B.Sc, Biochemistry, M.Sc Biochemistry and Allied Biochemistry Courses were discussed in the BOS.

The members after careful scrutiny of the changes to be made unanimously accorded approval for the proposed changes/modifications. They also resolved to authorize the Chairman of Board of Studies to place the changes/modifications now approved by the BOS before the Standing Committee on Academic affairs and Academic Council.

Agendum 1: Confirmation of the previous Meeting Minutes

Discussion: Minutes of the previous meeting were confirmed and accepted.

Resolution: The coordinator read the minutes of earlier meeting and the minutes were reviewed and passed by the members.

Agendum 2: Action taken on the previous Meeting Minutes

Discussion: The details of the action taken were presented to the members

Resolution: The members expressed satisfaction over the action taken

Agendum 3: To scrutinize the stakeholder feedback on UG, PG curriculum

Discussion: 1. More courses covering the entrepreneurship should be offered
2. nutrition based papers to be introduced in BSc syllabus
3. More appropriate and enterpruership based new allied biochemistry papers should be offered for Bsc Microbiology and Biotechnology programes
4. plant based biochemistry paper to be offered for MSc biochemistry

Resolution: The board unanimously resolved to make necessary changes as requested by the stake holders

Agendum 4: To consider the inclusion of audit course in the curriculum

Discussion:

Resolution: The members of the board resolved to approve the continuation of audit course in the curriculum

Agendum 5: To consider the introduction of employment oriented add on courses

Discussion : The existing syllabus gives enough opportunity for employability and there was no urgent need to introduce new add on courses. Also, it was pointed out that, the syllabus should be revised compulsorily if the university decides to offer 4 years BSc programme according to New Education Policy 2022

Resolution: Resolved to introduce some more employment oriented add on courses in the next BOS meeting

Agendum 6: To recommend the panel of examiners for BSc, MSc programme

Discussion: Members suggested the names of the experts who would serve as a panel of examiners for different programs.

Resolution: The BOS approved a tentative list of subject experts for paper setting , moderation and examiners. If required few more experts may be included with the permission of the concerned authorities.

Agendum 7:

Review of curriculum & syllabus in BSc biochemistry-regulation-2020

Discussion

- To discuss the modifications in the syllabi for First- Bsc Microbiology allied Biochemistry Syllabus.
- As such, the curriculum is revisited and certain sweeping changes have been made – by introducing new courses and improvising the syllabi of many courses. The honorable members Board of Studies has expressed their appreciations for the changes made commenting that they address the current demands of the Industry Profession.

Resolution:

**Resolved to Improvements in Course Contents of the following paper
Allied Biochemistry for BSc Microbiology**

Course Title	Category	Introduced in
22115AEC14-Biochemistry -I	Core Theory	I semester
22115AEC16L-Biochemistry Lab-I	Core Practical	I semester
22115AEC24- Biochemistry -II	Core Theory	II semester
22115AEC26L-Biochemistry Lab-II	Core Practical	II semester

Resolved to introduce new paper

Allied Biochemistry paper for BSC Biotechnology course

Course Title	Category	Introduced in
20115AEC34- Biochemistry -I	Core Theory	III semester
20115AEC36L- Biochemistry Lab-I	Core Practical	III semester
20115AEC44- Biochemistry -II	Core Theory	IV semester
20115AEC46L- Biochemistry Lab-II	Core Practical	IV semester

The following new courses are introduced in the curriculum BSC Biochemistry regulation 2022:

Course Title	Category	Introduced in
20115AEC43- Human Physiology And Nutritional Biochemistry	Core Theory	IV semester
22115DSC54C- Structural Biology	Electives Theory	V semester
22115DSC54D- Human Genetics	Electives Theory	V semester
22115DSC54E- Virology	Electives Theory	V semester
22115DSC63C- Introductory Microbiology	Electives Theory	VI semester
22115DSC63D- Bioethics & Biosafety	Electives Theory	VI semester
22115DSC63E- Immunochemistry	Electives Theory	VI semester

Review of curriculum & syllabus in Msc biochemistry-regulation 2022

1. Resolved to introduce the following Courses in the M.Sc.(Biochemistry) programme curriculum with effect from 2022-23

Course Title	Category	Introduced in
20215DSC15B- Biotechnology	Electives Theory	I semester

20215SEC31- Molecular Biology and Genetics	Core Theory	III semester
20215SEC41-Plant Biochemistry	Core Theory	IV semester
20215SEC42-Immunology	Core Theory	IV semester
20215SEC43L-Immunology Lab	Core Practical	IV semester
22215DSC15C - Functional Genomics and Metabolomics	Electives Theory	I semester
22215DSC15D - Genetic Engineering and Applied Biology	Electives Theory	I semester
22215DSC15E - Organic and Biophysical Chemistry	Electives Theory	I semester
22215DSC25D -Microbial Biochemistry and Fermentation Technology	Electives Theory	II semester
22215DSC25E - Molecular Oncology	Electives Theory	II semester
22215DSC25F - Computational Biology	Electives Theory	II semester
22215DSC34C -Molecular Nutrition and Nutrigenomics	Electives Theory	III semester
22215DSC34D- Cell Dynamics	Electives Theory	III semester
22215DSC34E -Industrial enzymes	Electives Theory	III semester
22215DSC44C -Glycobiology	Electives Theory	IV semester
22215DSC44D - Animal Biotechnology	Electives Theory	IV semester
22215DSC44E -Classical and Molecular Genetics	Electives Theory	IV semester

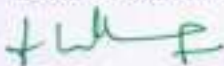
Dr. K. Jeyaprakash proposed including problem-based questions for postgraduate students. Members of the Board updated the panel of examiners and submitted the same to the Academic Council for its approval.

Agendum 8: Submission of project proposals for Faculty Development Programs, Major, Minor Research projects and conference/ seminar/ workshop
 Discussion: The external members recommended that faculty members and students should also apply for these types for projects to enhance research output of the department.

Resolution: Resolved to insist faculty members to submit proposals for Major-Minor research projects to different funding Agencies during the academic year.

Other Academic Activities: The students should complete a SWAYAM-MOOC before the completion of the 6th semester and the course completed certificate should be submitted to the HoD.

Signature:
Chair/HoD:
Dept.: Biochemistry
Name: Dr.A.Bakrudeen Ali Ahamed
Date: 04.05.2022




Dr. A. BAKRUDEEN ALI AHMED
Associate Professor, Dept. of Bio Chemistry-
Center for Research & Development (CRD)
PRIST Deemed University, Thanjavur-613 403
Tamil Nadu, India

Mandatory Attachments:

1. Minutes of the previous BoS meeting minutes and report on the follow-up action taken.
2. BoS Meeting 'Notification' sent to all members, including online meeting link.
3. Online Screenshots and geo-tagged photos in the venue.
4. Attendance sheet print of online attendees.
5. Detailed syllabi with PEOs, POs, COs, etc. (in Annexures), if new Programme(s) introduction /Curriculum revision is discussed.

Note: The 'minutes' of the BoS meeting along with the attachments as listed above must be mailed to the Registrar by the HoD within three days after the meeting, copying Dean concerned, Dean - Academic Affairs and the VC's office.

Signature: 
Dean:
School: Arts and Science
Name: Dr.L.Chinnappa
Date: 4.05.2022

Dr. L. CHINNAPPA
M.Sc., M.Phil., PGDCA, PGDBA, M.Tech., Ph.D.
Dean of Arts & Science
PRIST Deemed to be University
Thanjavur - 613 403, Tamilnadu.

* This 'Minutes' contain a total of six (in words) pages

PRIST Deemed to be University
Thanjavur
BOS meeting
Date: 4.5.2022
Department of Biochemistry
LIST OF EXTERNAL MEMBERS

	Designation	Name	
1	Chairperson/hoD	DR.BAKRUDEEN ALI	<i>J. Bakrudeen Ali</i> 9/5/22 Dr. A. BAKRUDEEN ALI AHMED Associate Professor, Dept. of Bio Chemistry Center for Research & Development (CRD) PRIST Deemed University, Thanjavur-613 403 Tamil Nadu, India
2	External Expert- Academic	DR. K. JEYAPRAKASH	<i>K. Jeyaprakash</i> Dr. K. JEYAPRAKASH, M.Sc. M.Phil. Ph.D. PGD Head, PG & Research Dept. of Biochemistry, Rajah Serfoji Govt. College (Autonomous), THANJAVUR - 613 005.
3	External Expert- Industry	DR.R.SOKIRTHA	<i>R. Sokirtha</i>
4	Professor	DR.A.SOBINA CHANDRA PACKIAVATHI	<i>A. Sobina Chandra Packiasamy</i>
5	Associate Professor	Dr.S.AMBIGA	<i>S. Ambiga</i> 4/5/22
6	Assistant Professor	DR.S.SATHISHKUMAR	<i>S. Sathish Kumar</i> 4/5/2022
7	Assistant Professor	MR.R.VISWALINGAM	<i>R. Viswalingam</i> 04/05/22
8	Special Invitee-Dean	Dr.L.Chinnappa	<i>L. Chinnappa</i> 4/5/22
9	Special Invitee- Alumnus/Alumna	L.VIJUNE LAWRENCE	<i>L. Vijune Lawrence</i>
10	Special Invitee -Current student - UG or PG	M.ANBU MATHI	<i>M. Anbumathi</i>



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SCHOOL OF ARTS AND SCIENCE

DEPARTMENT OF BIOCHEMISTRY
B.Sc., BIOCHEMISTRY- REGULATION 2022
COURSE STRUCTURE
SEMESTER - I

Course Code	Course Title	L	T	P	C
THEORY					
22110AEC11/ 22111AEC11/ 22132AEC11/ 22135AEC11	Tami - I/Advanced English-I/Hindi-I/ French - I	4	0	0	2
22111AEC12	English-I	4	0	0	2
22115AEC13	Biomolecules	6	1	0	5
22114AEC14	Chemistry -I	6	1	0	4
PRACTICAL					
22115AEC15L	Biomolecules Lab-I	0	0	3	2
22114AEC16L	Volumetric Analysis Lab	0	0	3	2
	Total	20	2	6	17
AUDIT COURSE					
221ACLSICN	Indian Constitution	-	-	-	2
221ACLSUHV	Universal Human Values	-	-	-	2

SEMESTER - II

Course Code	Course Title	L	T	P	C
THEORY					

22110AEC21/ 22111AEC21/ 22132AEC21/ 22135AEC21	Tamil – II/ Advanced English-II/Hindi-II/ French – II	4	0	0	2
22111AEC22	English-II	4	0	0	2
22115AEC23	Biochemical Techniques	6	1	0	5
22114AEC24	Chemistry – II	6	1	0	4
PRACTICAL					
22115AEC25L	Biochemical Techniques Lab-I	0	0	3	2
22114AEC26L	Organic Analysis Lab	0	0	3	2
RESEARCH SKILL BASED COURSE					
22115RLC27	Research Led Seminar	-	-	-	1
	Total	20	2	6	18
AUDIT COURSES					
221ACLSCOS	Communication Skills	-	-	-	2
221ACSSBBE	Basic Behavioral Etiquette	-	-	-	2

SEMESTER – III

Course Code	Course Title	L	T	P	C
THEORY					
22110AEC31/ 22132AEC31/ 22111AEC31/ 22135AEC31	Tamil – III/Hindi-III/Advanced English-III/ French – III	4	0	0	2
22111AEC32	English-III	4	0	0	2
22115AEC33	Cell Biology and Genetics	4	1	0	4
22120AEC34	Programming in C	4	1	0	5
PRACTICAL					
22115AEC35L	Cell Biology and Genetics Lab	0	0	3	2
22120AEC36L	Programming in C Lab	0	0	3	2
RESEARCH SKILL BASED COURSE					
22115RMC37	Research Methodology	2	0	0	2

		Total	18	2	6	19
AUDIT COURSE						
221ACLSOAN	Office Automation		-	-	-	2

SEMESTER – IV

Course Code	Course Title	L	T	P	C
THEORY					
22110AEC41/ 22111AEC41/ 22132AEC41/ 22135AEC41	Tamil-IV/Advanced English-IV /Hindi-IV/ French – IV	4	0	0	2
22111AEC42	English-IV	4	0	0	2
22115AEC43	Human Physiology and Nutritional Biochemistry	4	1	0	4
22120AEC44	Fundamentals of Computing	5	1	0	5
221ENSTU45	Environmental studies	2	0	0	2
PRACTICAL					
22115AEC46L	Biochemical Techniques Lab-II	0	0	3	2
22120AEC47L	Web Design Lab	0	0	3	2
	Total	19	2	6	19
AUDIT COURSE					
221ACLSLMS	Leadership and Management Skills	-	-	-	2
221ACSSAQA	General Aptitude and Quantitative Ability	-	-	-	2

SEMESTER – V

Course Code	Course Title	L	T	P	C
THEORY					
22115AEC51	Enzymes	4	1	0	4
22115AEC52	Bioenergetics and Metabolism	4	1	0	3
22115AEC53	Immunology	4	1	0	4
22115DSC54__	Discipline Specific Elective -I	4	1	0	3
PRACTICAL					
22115AEC55L	Food and enzyme Analysis Lab	0	0	3	2

22115AEC56L	Immunology Lab	0	0	3	2
RESEARCH SKILL BASED COURSE					
22115BRC57	Participation in Bounded Research	-	-	-	1
	Total	16	4	6	19
AUDIT COURSE					
221ACLSPSL	Professional Skills	-	-	-	2

SEMESTER – VI

Course Code	Course Title	L	T	P	C
THEORY					
22115AEC61	Clinical Biochemistry	4	1	0	4
22115SEC62	Molecular Biology	4	1	0	5
22115DSC63_	Discipline Specific Elective -II	4	1	0	3
221—OEC (2 DIGIT COURSE Name)	Open Elective Course	4	0	0	2
PRACTICAL					
22115AEC64L	Hematology and clinical biochemistry Lab	0	0	3	2
22115SEC65L	Molecular Biology Lab	0	0	3	2
22115PRW66	Project Work	-	-	-	4
22115PROEE	Program Exit Examination	-	-	-	1
	Total	16	3	6	23
AUDIT COURSE					
221ACSSIST	Interview Skills Training and Mock Test	-	-	-	2
221ACLSCET	Community Engagement	-	-	-	1
Total Credits -Programme					115
Total Credits - Audit Courses					19

Discipline Specific Electives

Semester	Discipline Specific Elective Courses-I
V	a) 22115DSC54A - Pharmaceutical Biochemistry b) 22115DSC54B - Basic Biotechnology c) 22115DSC54C - Structural Biology d) 22115DSC54D - Human Genetics e) 22115DSC54FE - Virology
	Discipline Specific Elective Courses-II
VI	a) 22115DSC63A - Biochemistry of plants and microbes b) 22115DSC63B - Hospital Management c) 22115DSC63C - Introductory Microbiology d) 22115DSC63D - Bioethics & Biosafety e) 22115DSC63E - Immunochimistry

Open Electives

Semester	Open Elective Courses
VI	a) 221TNOEC-Tamil - Hakkiya Varaluru b) 221HNOEC-Journalism c) 221MAOEC-Development of Mathematical Skills d) 221PHOEC-Instrumentation e) 221CEOEC-Food and Adulteration f) 221CSOEC - E-Learning g) 221CAOEC-Web Technology h) 221CMOEC-Banking service

Credit Distribution

Sem	AEC	SEC	DSC	OEC	Research	Others	Total
I	17	-	-	-	-	-	17
II	17	-	-	-	1	-	18
III	17	-	-	-	2	-	19
IV	17	-	-	-	-	2	19
V	15	-	3	-	1	-	19
VI	11	2	3	2	4	1	23
Total	94	2	6	2	8	3	115


 Dean
 School of Arts & Science
 Pannaiyeh Rajaratnam Institute of
 Science & Technology (P.R.I.S.T.)



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SCHOOL OF ARTS AND SCIENCE

M. Sc BIOCHEMISTRY -SYLLABUS - REGULATION 2022

COURSE STRUCTURE

Course Code	Course Title	L	T	P	C
SEMESTER I					
22215SEC11	Biomolecules	6	1	0	5
22215SEC12	Biochemical and Instrumental analysis	6	1	0	5
22215SEC13	Enzymology	6	1	0	4
22215SEC14L	Biochemical Techniques Lab - I	0	0	4	2
22215DSC15_	Discipline specific elective	5	0	0	4
22215RLC16	Research Led Seminar	-	-	-	1
	Total	23	3	4	21
SEMESTER II					
22215SEC21	Cellular Biochemistry	5	1	0	5
22215SEC22	Metabolism and Regulation	5	1	0	5
22215SEC23	Neuro Biochemistry	5	0	0	4
22215SEC24L	Enzymology Lab- II	0	0	4	2
22215DSC25_	Discipline Specific Elective -II	5	0	0	4
22215RMC26	Research Methodology	3	0	0	2
22215BRC27	Participation in Bounded Research	-	-	-	2
	Total	23	2	4	24
SEMESTER III					
22215SEC31	Molecular Biology and genetics	6	1	0	6
22215SEC32	Clinical Biochemistry	6	1	0	6
22215SEC33L	Clinical Biochemistry Lab	0	0	5	3
22215DSC34_	Discipline Specific Elective -III	5	0	0	4
222_OEC	Open Elective	4	0	0	3
22215SRC35	Design/Socio technical research	-	-	-	2
	Total	21	2	5	24
SEMESTER IV					
22215SEC41	Plant Biochemistry	6	1	0	6
22215SEC42	Immunology	6	1	0	6

22215SEC43L	Immunology lab	0	0	5	3
22215DSC44	Discipline Specific elective -IV	5	0	0	4
22215PRW45	Project Work	-	-	-	6
22215PEE	Programme Exit Examination	-	-	-	2
Total		17	2	5	27
Total Credits for the Programme					96

Discipline specific Electives

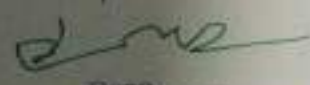
Semester	Discipline specific Elective Courses-I
I	a) 22215DSC15A- Biostatistics 22215DSC15B- Biotechnology b) 22215DSC15C- Functional Genomics and Metabolomics c) 22215DSC15D- Genetic Engineering and Applied Biology d) 22215DSC15E- Organic and Biophysical Chemistry
Discipline specific Elective Courses-II	
II	a) 22215DSC25A- Endocrinology b) 22215 DSC25B- Clinical nutrition and dietetics c) 22215 DSC25C - Bioinformatics d) 22215 DSC25D- Microbial Biochemistry and Fermentation Technology e) 22215 DSC25E- Molecular Oncology f) 22215 DSC25F- Computational Biology
Discipline specific Elective Courses-III	
III	a) 22215DSC34A- Genomics and Genetic Engineering b) 22215DSC34B- Pharmaceutical Biotechnology c) 22215DSC34C- Molecular Nutrition and Nutrigenomics d) 22215DSC34D- Cell Dynamics e) 22215DSC34E- Industrial enzymes
VI	a) 22215DSC44A - Medical Biotechnology b) 22215DSC44B - Applied Microbial Biochemistry c) 22215DSC44C- Glycobiology d) 22215DSC44D- Animal Biotechnology e) 22215DSC44E- Classical and Molecular Genetics

Open Electives

Semester	Open Elective Courses
III	a) 2222ENOEC - Writing for the media b) 2222MAOEC - Applicable Mathematics Techniques c) 2222PHOEC - Bio-Medical Instrumentation d) 2222CHOEC - Green Chemistry e) 2222SOEC - M-Marketing f) 2222MOEC - Financial Services

Credit Distribution:

Sem	SEC	DSC	OEC	RSB Courses	Others	Total
I	16	4	-	1	-	21
II	16	4	-	4	-	24
III	15	4	3	2	-	24
IV	15	4	-	6	2	27
Total	62	16	3	13	2	96


 Dean
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 Madam, Yanam - 515 409



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SCHOOL OF ARTS AND SCIENCE
DEPARTMENT OF PHYSICS
MINUTES OF THE MEETING OF THE BOARD OF STUDIES (BOS)

Board: Physics

The Meeting of Board of Studies (BOS) was held as given below:

Name of the Body	Board of Studies
Department	Physics
Meeting year	2022-23
Date and Time	10.05.2022 & 10:00 AM
Venue	Department of Physics
Members Attended	The details are given in the ANNEXURE-I

AGENDA	
1	Confirmation of the previous meeting minutes
2	Discussion about the revision of core and elective courses of UG curriculum
3	Discussion about the revision of core and elective courses of PG curriculum
4	Organizing industrial visit for students
5	Submission of project proposals to funding agencies and applying for funding to organize Faculty Development Programs, conference, seminar, workshop

Minutes of the meeting of the Board of Studies (BoS)*

Board: Physics

The Board of Studies meeting was held on 10.05.2022. The Chairman of BOS welcomed all the panel members for the meeting. The item listed in the agenda were taken for discussion.

Agendum 1: Confirmation of the previous meeting minutes

Discussion:

The minutes of the Board of Studies meeting held on 12.05.2021 were communicated to the members. The comments received have been incorporated and placed for confirmation. The same was approved by the Academic council.

Resolution: The Board resolved to accept the same.

Agendum 2: Discussion about core and elective courses of UG curriculum

Discussion : The members discussed elaborately about the existing curriculum of UG courses. It was planned that content of core courses was retained without any modification. In addition, new elective course, Physics Workshop Skill (20113DSC55B) was included in place of Laser Physics (20113DSC55B) in the semester-V. BOS members also suggested to include 7 new value added courses.

Members proposed that orientation courses can be conducted for first year UG students in such a way that they will understand about why they are studying the course.

Resolution: The board members recommended the above mentioned suggestions in UG curriculum

Agendum 3: Discussion about core and elective courses of PG curriculum

Discussion : The members discussed decoratively about the existing curriculum of PG courses. Members recommended that PG students can handle classes for their junior so that they can revise their basics.

It was planned that content of core courses was retained without any modification. Nevertheless, 4 new elective courses were introduced in all semesters (I, II, III and IV).

1. Fluid Mechanics (20213DSC15C)
2. Electromagnetic Induction (20213DSC25C)
3. Waves and Optics (20213DSC35C)
4. Thermal Physics (20213DSC45C)

BOS members also recommended to include 7 new value added courses.

Resolution: The board members approved the above suggestions in PG curriculum

Agendum 4: Organizing industrial visit for students

Discussion: External expert suggested that final year B.Sc., and M.Sc., students have to be allowed to go for industrial visit so that the students can get industrial exposure. External expert can also impart internship training to the students.

Resolution: After the discussion, the members insisted that final year B.Sc., and M.Sc., students have to be taken to industries so as to get industrial exposure and for getting internships.

Agendum 5: Submission of project proposals to funding agencies and applying for funding to organize Faculty Development Programs, conference, seminar, workshop

Discussion: The external members recommended that faculty members and students should also apply for these kinds for funding to enhance research output of the department.

Resolution: Resolved to insist faculty members to submit proposals for Major-Minor research projects to different funding Agencies during academic year. Improvement of laboratory infrastructure using the funding from different funding agencies.

The chairman of Board of Studies (BOS) thanked all the members for their active participation and cordially invited them for the next meeting.

Date: 10.05.2022

Dean

Dean of Arts & Science
PRIST Deemed to be University
Thanjavur - 613 403, Tamilnadu.

Signature
(Dr. M. Sivanantham)

BOS Chairman/HOD Seal

The Head, Department of Physics,
PRIST Deemed to be University,
Vallam, Thanjavur-613403,
Tamilnadu, India.

ATTENDANCE OF THE BOARD OF STUDIES MEETING

Board: Physics

Date: 10.05.2022

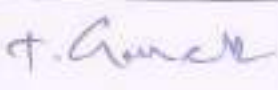
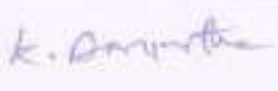
Time: 10:00 am

Venue: Department of Physics

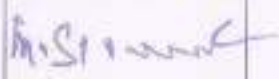

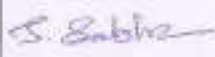
The following members were present for the Board of Studies meeting

Chair: Dr. M. Sivanantham, M.Sc., M.Phil., Ph. D, Associate Professor & HOD

External Members

S.No.	Name/Degree/Designation	Institute/Organization/ Full address	Signature
1	Dr. T. GANESH, M.Sc., M.Phil., M. Tech., Ph.D., Associate Professor	Department of Physics Rajah Serfoji Government College, Thanjavur- 613005	
2	K. Amirtha Ganesh, M.E., Chief Innovation Officer, Three Dots Innovations	Three Dots Innovations LLP Plot No.121, Rahman Nagar, Neelagiri Thanjavur- 613004	

Internal Members

S.No.	Name/Degree/Designation	Department	Signature
1	Dr. M. Sivanantham M.Sc., M.Phil., Ph.D., HOD, Associate Professor	Physics	
2	Dr. L. Chinnappa, M.Sc., M. Phil, Ph.D., PGDCA., Dean & Professor, School of Arts and Science, PRIST Deemed to be University, Thanjavur	Dean & Professor, School of Arts and Science, PRIST Deemed to be University, Thanjavur	
3	Dr. S. Subashchandrabose, M.Sc., M.Phil., Ph.D, Professor	Physics	

4	Dr. Sutapa Ghosh M.Sc., Ph.D. Associate Professor	Physics	<i>Sutapa</i>
5	Dr. V. Vidhya M.Sc., M.Phil., Ph.D. Assistant Professor	Physics	<i>V. Vidhya</i>
6	Mr. K. Swaminathan, M.Sc., M.Phil., Assistant Professor	Physics	<i>Swami</i>
7	Dr. K. Thirunavukarasu M.Sc., M.Phil., Ph.D. Assistant Professor	Physics	<i>K. Thirun</i>

Invited Participants

S.No.	Name/Degree/Designation	Department/Class Institute/Organization/Address	Signature
1	Dr. L. Chinnappa, M.Sc., M. Phil, Ph.D., PGDCA., Dean & Professor, School of Arts and Science, PRIST Deemed to be University, Thanjavur	Dean & Professor, School of Arts and Science, PRIST Deemed to be University, Thanjavur	<i>L. Chinnappa</i>
2	K.T. Barshini, B. Sc., Student	PRIST Deemed to be University, Thanjavur	<i>K.T. Barshini</i>
3	K. Ranjith kumar, Alumni	PRIST Deemed to be University, Thanjavur	<i>K. Ranjith</i>

L. Chinnappa

Date: 10.05.2022

Dean

Dean of Arts & Science
PRIST Deemed to be University
Thanjavur - 613 103, Tamil Nadu

M. Sivanantham

Signature
(Dr. M. Sivanantham)

BOS Chairman/HOD Seal

The Head, Department of Physics,
PRIST Deemed to be University,
Vallam, Thanjavur-613403.
Tamilnadu, India.

List of new courses

1. Physics Workshop Skill
2. Fluid Mechanics
3. Electromagnetic Induction
4. Waves and Optics
5. Thermal Physics

List of new value-added courses

1. Diploma course on crystal growth analysis
2. Certificate course on semiconductor physics
3. Certificate course on mathematical foundation for physics
4. Certificate course on industry linked optical fiber technology
5. Certificate course on installation and maintenance of solar photovoltaic systems
6. Certificate course on installation and maintenance of digital circuits
7. Certificate course on microcontroller

B.Sc., PHYSICS -COURSE STRUCTURE

Course Code	Course Title	L	T	P	C
SEMESTER I					
THEORY					
20110AEC11	Tamil-I	4	0	0	2
20111AEC11	Advanced English-I				
20132AEC11	Hindi-I				
20135AEC11	French-I				
20111AEC12	English-I	4	0	0	2
20113AEC13	Properties of Matter	5	1	0	4
20112AEC15A	Calculus and Fourier series	4	-	0	4
20112AEC16A	Algebra and Trigonometry	4	-	0	3
PRACTICAL					
20113SEC14L	Properties of Matter Lab	0	0	3	2
Total		21	1	3	17
AUDIT COURSE					
201ACLSICN	Indian Constitution	-	-	-	2
201ACLSUHV	Universal Human Values	-	-	-	2

SEMESTER II

Course Code	Course Title	L	T	P	C
THEORY					
20110AEC21	Tamil-II	4	0	0	2
20111AEC21	Advanced English-II				
20132AEC21	Hindi-II				
20135AEC21	French-II				
20111AEC22	English-II	4	0	0	2
20113AEC23	Mechanics And special theory of Relativity	6	1	0	4
20112AEC25A	ODE,PDE and Laplace Transform	5	0	0	4
20112AEC26A	Analytical Geometry in Vector Calculus	4	0	0	3
PRACTICAL					
20113SEC24L	Mechanics Lab	0	0	3	2
RESEARCH SKILL BASED COURSE					
20113RLC27	Research Led Seminar	-	-	-	1
Total		23	1	3	18
AUDIT COURSE					
201ACLSCOS	Communication Skills	-	-	-	2
201ACSSBBE	Basic Behavioral Etiquette	-	-	-	2

SEMESTER III

Course Code	Course Title	L	T	P	C
SEMESTER I					
THEORY					
20110AEC11	Tamil-I	4	0	0	2
20111AEC11	Advanced English-I				
20132AEC11	Hindi-I				
20135AEC11	French-I				
20111AEC12	English-I	4	0	0	2
20113AEC13	Properties of Matter	5	1	0	4
20112AEC15A	Calculus and Fourier series	4	-	0	4
20112AEC16A	Algebra and Trigonometry	4	-	0	3
PRACTICAL					
20113SECI4L	Properties of Matter Lab	0	0	3	2
Total		21	1	3	17
AUDIT COURSE					
201ACLSICN	Indian Constitution	-	-	-	2
201ACLSUHV	Universal Human Values	-	-	-	2

SEMESTER IV

Course Code	Course Title	L	T	P	C
THEORY					
20110AEC41	Tamil-IV	4	0	0	2
20111AEC41	Advanced English-IV				
20132AEC41	Hindi-IV				
20135AEC41	French-IV				
20111AEC42	English-IV	4	0	0	2
20113AEC43	Optics	5	0	0	4
20114AEC45	Chemistry-II	6	0	0	5
201ENVTSTU	Environmental Studies	2	0	0	2
PRACTICAL					
20113SEC44L	Optics Lab	0	0	3	2
20114SEC46L	Volumetric Analysis Lab -II	0	0	3	2
TOTAL		21	0	3	19
AUDIT COURSE					
201ACLSLMS	Leadership and Management Skills	-	-	-	2
201ACSSAQA	General Aptitude and Quantitative Ability	-	-	-	2

SEMESTER V

Course Code	Course Title	L	T	P	C
THEORY					
20113AEC51	Electricity and Magnetism	5	0	0	4
20113AEC52	Atomic Physics	4	1	0	3
20113AEC53	Basic Electronics	4	1	0	4
20113DSC56	Discipline Specific Elective – I	5	0	0	3
RESEARCH SKILL BASED COURSE					
20113BRC57	Participation in Bounded research	-	-	-	1
PRACTICAL					
20113SEC54L	Electricity and Magnetism Lab	0	0	3	2
20113SEC55L	Basic Electronics Lab	0	0	3	2
TOTAL		18	2	6	19
AUDIT COURSE					
201ACLSPSL	Professional Skills	-	-	-	2

SEMESTER VI

Course Code	Course Title	L	T	P	C
THEORY					
20113AEC61	Digital Electronics & Microprocessor	4	1	0	4
20113AEC62	Elements of Theoretical Physics	5	0	0	5
20113DSC65	Discipline Specific Elective –II	5	0	0	3
201 OEC	Open Elective Course	4	0	0	2
PRACTICAL					
20113SEC63L	Digital Electronics Lab	0	0	3	2
20113SEC64L	Microprocessor Lab	0	0	3	2
20113PRW66	Project Work	-	-	-	4
20113PEE	Programme Exit Examination	-	-	-	1
TOTAL		18	1	6	23
AUDIT COURSE					
201ACSSIST	Interview Skills Training and Mock Test	-	-	-	2
201ACLSCET	Community Engagement	-	-	-	1
TOTAL CREDITS					115
Total Credits – Audit Courses					19

Discipline Specific Electives

Semester	Discipline Specific Elective Courses -I
V	a) 20113DSC55A- Digital Photography b) 20113DSC55B- Physics Workshop Skill

Semester	Discipline Specific Elective Courses - II
VI	a) 20113DSC64A-Polymer Physics b) 20113DSC64B- Physics of Radiography

General Electives

Semester	General Elective Courses
V	a) 20111GEC-Journalism b) 20112GEC-Development of Mathematical Skills c) 20114GEC-Food and Adulteration d) 20117GEC-Mushroom Technology e) 20120GEC-Web Technology f) 20122GEC-E-Commerce and its Application g) 20161GEC-Indirect Taxes

Skill based Electives

Semester	Skill based Elective Courses
I	a) 20120SEC01AL-Package Lab - I b) 20160SEC01B-Soft skill - I
II	a) 20120SEC02AL-Package Lab - II b) 20160SEC02B-Soft skill - II
III	a) 20120SEC03AL-Package Lab -III b) 20160SEC03B-Soft skill - III
IV	a) 20120SEC04AL-Package Lab -IV b) 20160SEC04B- Soft skill - IV
V	a) 20120SEC05AL-Package Lab -V b) 20160SEC05B-Soft skill - V
VI	a) 20120SEC06AL-Package Lab -VI b) 20160SEC06B-Soft skill - VI

Credit Distribution

SEM	AEC	SEC	DSC	OEC	Research	NON CGP	Total
I	15	2	-	-	-	-	17
II	15	2	-	-	1	-	18
III	13	4	-	-	2	-	19
IV	13	4	-	-	-	2	19
V	11	4	3	-	1	-	19
VI	9	4	3	2	4	1	23
Total	76	20	6	2	8	3	115

M.Sc., PHYSICS
COURSE STRUCTURE

Course Code	Course Title	L	T	P	C
SEMESTER I					
20213AEC11	Advanced Mathematical Physics	6	1	0	5
20213AEC12	Classical and Statistical Mechanics	6	1	0	5
20213AEC13	Electronics and Communication	6	1	0	4
20213SEC14L	Spectroscopy and General Electronics Lab	0	0	4	2
20213DSC15_	Discipline Specific Elective – I	5	0	0	4
20213RLC16	Research Led seminar	-	-	-	1
	Total	23	3	4	21
SEMESTER II					
20213AEC21	Microprocessor and Microcontroller	5	1	0	5
20213AEC22	Quantum Mechanics	5	1	0	5
20213AEC23	Condensed Matter Physics	5	0	0	4
20213SEC24L	Advanced General Experiments Lab	0	0	4	2
20213DSC25_	Discipline Specific Elective – II	5	0	0	4
20213RMC26	Research Methodology	3	0	0	2
20213BRC27	Participation in Bounded Research	-	-	-	2
	Total	23	2	4	24
SEMESTER III					
20213AEC31	Electro Magnetic Theory	6	1	0	6
20213AEC32	Nuclear and Particle Physics	6	1	0	6
20213SEC33L	Advanced Electronics Lab	0	0	5	3
20213DSC34_	Discipline Specific Elective – III	5	0	0	4
202_OEC35_	Open Elective	4	0	0	3
20213SRC36	Participation in Scaffold Research (Societal Project)	-	-	-	2
	Total	21	2	5	24
SEMESTER IV					
20213AEC41	Laser Physics And Non Linear Optics	6	1	0	6
20213AEC42	Numerical Methods and Computational Physics	6	1	0	6
20213SEC43L	Numerical Methods Lab with C++ Programming	0	0	5	3
20213DSC44_	Discipline Specific Elective – IV	5	0	0	4
20213PRW45	Project Work	0	0	0	6
20213PEE	Programme Exit Examination	-	-	-	2
	Total	17	2	5	27
	Total Credits for the Programme				96

Discipline Specific Electives

Semester	Discipline specific Elective Courses- I
I	a) 20213DSC15A - Computational Physics b) 20213DSC15B- Crystal Growth Processes c) 20213DSC15C- Fluid Mechanics
Semester	Discipline specific Elective Courses -II
II	a) 20213DSC25A - Radiation Safety b) 20213DSC25B- Renewable Energy c) 20213DSC25C-Electromagnetic Induction
Semester	Discipline specific Elective Courses -III
III	a) 20213DSC34A- Photonics Devices and Applications b) 20213DSC34B- Analog Systems and Applications c) 20213DSC34C-Waves and Optics
Semester	Discipline specific Elective Courses -IV
IV	a) 20213DSC43A- Elements of Modern Physics b) 20213DSC43B- Non-linear Dynamics c) 20213DSC43C- Thermal Physics

General Electives

Semester	General Elective Courses
III	a) 20211GEC- Writing for the Media b) 20212GEC-Applicable Mathematics Techniques c) 20214GEC- Green Chemistry d) 20215GEC-Bio-analytical Techniques e) 20220GEC-Internet and Web Design f) 20261GEC- Insurance Services g) 20280GEC-Counselling Psychology

Credit Distribution:

Sem	AEC	SEC	DSC	OEC	Research	Others	Total
I	14	2	4	-	1	-	21
II	14	2	4	-	4	-	24
III	12	3	4	3	2	-	24
IV	12	3	4	-	6	2	27
Total	52	10	16	3	13	2	96

Course Code	Physics Workshop Skills
20113DSC55H	

The aim of this course is to enable students to get familiar with various mechanical and electrical tools in hands-on mode

Unit I: Introduction

Measuring units, conversion to SI and CGS. Familiarization with meter scale, Vernier calliper, Screw gauge and their utility. Measure the dimension of a solid block, volume of cylindrical beaker/glass, diameter of a thin wire, thickness of metal sheet, etc. Use of Sextant to measure height of buildings, mountains, etc.

Unit II: Mechanical Skill

Concept of workshop practice. Overview of manufacturing methods: casting, foundry, machining, forming and welding. Types of welding joints and welding defects.

Unit III: Materials

Common materials used for manufacturing like steel, copper, iron, metal sheets, composites and alloy, wood. Concept of machine processing, introduction to common machine tools like lathe, shaper, drilling, milling and surface machines. Cutting tools, lubricating oils.

Unit IV: Electrical and Electronic Skill

Use of Multimeter. Soldering of electrical circuits having discrete components (R, L, C, diode) and ICs on PCB. Operation of oscilloscope. Making regulated power supply. Timer circuit, Electronic switch using transistor and relay.

Unit V: Introduction to prime movers:

Mechanism, gear system, wheel, Fixing of gears with motor axel. Lever mechanism, Lifting of heavy weight using lever, use of pulley, braking systems, working principle of electrical power generation systems.

Reference Books:

- [1] A text book in Electrical Technology-B L Theraja – S. Chand and Company.
- [2] Performance and design of AC machines – M.G. Say, ELBSEdn.
- [3] Mechanical workshop practice, K.C. John, 2010, PHI Learning Pvt.Ltd.
- [4] Workshop Processes, Practices and Materials, Bruce J Black 2005, 3rd Edn., Editor Newnes [ISBN: 0750660732]
- [5] New Engineering Technology, Lawrence Smyth/Liam Hennessy, The Educational Company of Ireland [ISBN: 0861674480]



Course Code 20213DSC15C	FLUID MECHANICS
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Aim: The course is designed to give fundamental knowledge of fluid, its properties and behavior under various conditions.

Sr. No	Content
1	Fluids and Their Properties: Introduction of fluid, fluid classifications, hypothesis of continuum, Shear stress in a moving fluid, molecular structure of material, fluid density, viscosity, causes of viscosity in gases and liquids, surface tension, capillary effect, vapor pressure, cavitation, compressibility and the bulk modulus
2	Pressures and Head: Types of Pressure, Pascal's law of pressure at a point, variation of pressure vertically in a fluid under gravity, equality of pressure at the same level in a static fluid, general equation for the variation of pressure due to gravity from a point to point in a static fluid, pressure and head, the hydrostatic paradox, pressure measurements using Elastic Pressure Transducers, Force Balance Pressure gauge, Electrical Pressure Transducers
3	Static Forces on Surface and Buoyancy: Fluid static, action of fluid pressure on surface, resultant force and center of pressure on a plane surface under uniform pressure, resultant force and center of pressure on a plane surface immersed in a liquid, pressure diagrams, forces on a curved surface due to hydrostatic pressure, buoyancy, equilibrium of floating bodies, stability of a submerged body, stability of floating bodies, determination of the metacentric height, determination of the position of the metacentre relative to the center of buoyancy.
4	Motion of Fluid Particles and Streams: Fluid flow, different types of flow, frames of reference, analyzing

	fluid flow, motion of a fluid particle, acceleration of a fluid particle, discharge and mean velocity, continuity of flow, continuity equations for 2-D and 3-D flow in Cartesian coordinates of system.
5	The Energy Equation and its Application: Momentum and fluid flow, Momentum equation for 2-D and 3-D flow along a stream line, momentum correction factor, Euler's equation of motion along a stream line, Mechanical energy of a flowing fluid – Bernoulli's theorem, kinetic energy correction factor, pitot tube, determination of volumetric flow rate via pitot tube, changes of pressure in tapering pipe, principle of venturimeter, pipe orifices, theory of small orifices discharging to atmosphere, theory of large orifices, Rotameter, elementary theory of notches and weirs, flow in a curved path

Reference Books:

1. Fluid Mechanics and Fluid Power Engineering by D.S. Kumar, S.K.Kataria & Sons
2. Fluid Mechanics and Hydraulic Machines by R.K. Bansal, Laxmi Publications
3. Fluid Mechanics and Hydraulic Machines by R.K. Rajput, S.Chand & Co.
4. Fluid Mechanics by Frank .M, White, McGraw Hill Publishing Company Ltd.
5. Fundamentals of Fluid Mechanics by Munson, Wiley India Pvt. Ltd
6. Fluid Mechanics by A. K. Mohanty, PHI Learning Pvt. Ltd.
7. Laboratory Manual Hydraulics and Hydraulic Machines by R V Raikar

Course Outcome:

After learning the course the students should be able to:

- Understand the basic concept of fluid mechanics.
- Understand statics, dynamics and various approaches to fluid mechanics.
- Understand fundamentals of flow through pipes.
- Understand basics of compressible flow
- Correlate fundamentals of fluid mechanics with various mechanical systems

Course Code	ELECTROMAGNETIC INDUCTION
20213DSC25C	

Pre-Requisites	
Different coordinate systems, Laplace's equation, conducting & non-conducting medium, basic definitions in magnetism, propagation of electromagnetic waves, plasma	
Learning Objectives	
<ul style="list-style-type: none"> > To acquire knowledge about boundary conditions between two media and the technique of method of separation of variables > To understand Biot – Savart's law and Ampere's circuital law > To comprehend the physical ideas contained in Maxwell's equations, Coulomb & Lorentz gauges, conservation laws > To assimilate the concepts of propagation, polarization, reflection and refraction of electromagnetic waves > To grasp the concept of plasma as the fourth state of matter 	

UNITS	Course Details
UNIT I: ELECTROSTATICS	Boundary value problems and Laplace equation – Boundary conditions and uniqueness theorem – Laplace equation in three dimension – Solution in Cartesian and spherical polar coordinates – Examples of solutions for boundary value problems. Polarization and displacement vectors - Boundary conditions - Dielectric sphere in a uniform field – Molecular polarizability and electrical susceptibility – Electrostatic energy in the presence of dielectric – Multipole expansion.
UNIT II: MAGNETOSTATICS	Biot-Savart's Law - Ampere's law - Magnetic vector potential and magnetic field of a localized current distribution - Magnetic moment, force and torque on a current distribution in an external field - Magneto static energy - Magnetic induction and magnetic field in macroscopic media - Boundary conditions - Uniformly magnetized sphere.
UNIT III: MAXWELL EQUATIONS	Faraday's laws of Induction - Maxwell's displacement current - Maxwell's equations - Vector and scalar potentials - Gauge invariance - Wave equation and plane wave solution- Coulomb and Lorentz gauges - Energy and momentum of the field - Poynting's theorem - Lorentz force - Conservation laws for a system of charges and electromagnetic fields.
UNIT IV: WAVE PROPAGATION	Plane waves in non-conducting media - Linear and circular polarization, reflection and refraction at a plane interface - Waves in a conducting medium - Propagation of waves in a rectangular wave guide. Inhomogeneous wave equation and retarded potentials - Radiation from a localized source - Oscillating electric dipole

UNIT V: ELEMENTARY PLASMA PHYSICS	The Boltzmann Equation - Simplified magneto-hydrodynamic equations - Electron plasma oscillations - The Debye shielding problem - Plasma confinement in a magnetic field - Magneto-hydrodynamic waves - Alfvén waves and magnetosonic waves.
UNIT VI: PROFESSIONAL COMPONENTS	Expert Lectures, Online Seminars - Webinars on Industrial Interactions/Visits, Competitive Examinations, Employable and Communication Skill Enhancement, Social Accountability and Patriotism
TEXT BOOKS	<ol style="list-style-type: none"> 1. D. J. Griffiths, 2002, <i>Introduction to Electrodynamics</i>, 3rd Edition, Prentice-Hall of India, New Delhi. 2. J. R. Reitz, F. J. Milford and R. W. Christy, 1986, <i>Foundations of Electromagnetic Theory</i>, 3rd edition, Narosa Publishing House, New Delhi. 3. J. D. Jackson, 1975, <i>Classical Electrodynamics</i>, Wiley Eastern Ltd. New Delhi. 4. J. A. Bittencourt, 1988, <i>Fundamentals of Plasma Physics</i>, Pergamon Press, Oxford. 5. Gupta, Kumar and Singh, <i>Electrodynamics</i>, S. Chand & Co., New Delhi
REFERENCE BOOKS	<ol style="list-style-type: none"> 1. W. Panofsky and M. Phillips, 1962, <i>Classical Electricity and Magnetism</i>, Addison Wesley, London. 2. J. D. Kraus and D. A. Fleisch, 1999, <i>Electromagnetics with Applications</i>, 5th Edition, WCB McGraw-Hill, New York. 3. B. Chakraborty, 2002, <i>Principles of Electrodynamics</i>, Books and Allied, Kolkata. 4. P. Feynman, R. B. Leighton and M. Sands, 1998, <i>The Feynman Lectures on Physics</i>, Vols. 2, Narosa Publishing House, New Delhi. 5. Andrew Zangwill, 2013, <i>Modern Electrodynamics</i>, Cambridge University Press, USA.
WEB SOURCES	<ol style="list-style-type: none"> 1. http://www.plasma.iii.se/CED/Book/index.html 2. http://www.thphys.nuim.ie/Notes/electromag/frame-notes.html 3. http://www.thphys.nuim.ie/Notes/em-topics/em-topics.html 4. http://dmoz.org/Science/Physics/Electromagnetism/Courses and Tutorials/ 5. https://www.cliffsnotes.com/study-guides/physics/electricity-and-magnetism/electrostatics

Course Code	Physics of Radiography
20113DSC65B	

Course Objectives:

- Study on x-ray production and its physics, different types of x-ray tube and x-ray generators.
- Learn about different image receptor systems like screen film radiography.
- Trained on Computed tomography and applications.
- Study on basic principles of ultrasound.
- Understand nuclear magnetic resonance and MRI

1. X-Ray Production, X-Ray Tubes and Generators: Discovery of X-rays, Production and properties of x-rays, X-ray tubes, X-ray tube insert, tube housing, filtration and collimation, X-ray generator -function and components, -circuit design, Timers in radiography. Factors affecting x-ray emission Power rating and heat loading x-ray exposure rating charts. Nature of Cooling, Safety devices in X-ray tubes, Mammography - X-ray tube design, X-ray generator and phototimer system, compression scattered radiation and magnification, screen-film cassettes and film processing, Ancillary procedures, radiation dosimetry. (16 hours)

2. Screen-Film Radiography and Film Processing: Basic geometric principles of radiographic image, Latent image, screen-film system, construction and Characteristics, optical density, contrast, speed and latitude, Types of films, intensifying screens – construction and action, Types of screens-rare earth, Fluoroscopic, Film exposure, Radiographic grids. Film processing, Automatic Film Processing, artifacts, Processor QA, Contrast and dose in radiography, scattered radiation in projection Radiography, reduction of patient dose, patient dose measurement, dose level for diagnostic procedures, methods to reduce patient dose. Image Quality –Unsharpness, Spatial resolution, Contrast, contrast agents, Image Noise, Image distortion and artifacts, detective quantity efficiency, sampling and aliasing in digital images, contrast-detail curves (16 hours)

3. Computed Tomography and Other X-ray techniques: Basic principles, Historical development, Detectors and detector arrays, Details of acquisition, Reconstruction algorithms, Radon Transform, Back Projection, Filtered Back projection, Iterative Reconstruction, ML-EM, Digital image display, scan motions, x-ray sources, collimation, X-ray detectors, viewing system, Radiation Dose, Image quality, Artifacts, Fluoroscopy, image intensification, Digital fluoroscopy, Automatic Brightness Control, Cine fluorography, Xeroradiography-. Digital Radiography- Thermography-Basic principles, scanning techniques, radiation dose to patients, Radiography of welds-casting and forgings, Microradiography, Autoradiography, Flash radiography, X-ray diffraction analysis. (16 hours)

4. Ultrasound: Basic principles, Characteristics of sound, nature and production of ultrasound, interaction of ultrasound with matter, Transducers and their design, Piezoelectric effect, frequency response of transducers, various types of transducers,

Ultrasound beam properties, Image data acquisition, Dynamic range, Different scan modes-A,B,M modes, Two-Dimensional image display and storage Real time scanning, Principles of Gray-scale imaging, significance of gain and gain compensation, pulse rate and its significance, Resolution and frequency, depth and frequency, Image quality, artifacts, Doppler techniques and principles of colour Doppler , System performance and QA, Acoustic power and biological effect of ultrasound (16 hours)

5. **Nuclear Magnetic Resonance (NMR) and MRI:** Magnetization properties, Generation and detection of magnetic resonance signals, Interaction of nuclei with a static magnetic field, Rotation and precession, Interaction of nuclei with radiofrequency wave, induction of a magnetic resonance signal in a coil, Quantum mechanical interpretation, Bulk magnetization, relaxation processes:T1 and T2, Relaxation times (T1 and T2) quality assurance, acceptance testing and commissioning of radiation system for biologic materials. Pulse sequences, spin echo, Inversion recovery, Gradient recalled echo, signal from flow, perfusion and diffusion contrast, Magnetization transfer contrast, Principles of MRI, Localization of MR signal, k-space data acquisition and image reconstruction, 3d Fourier transform image acquisition, image characteristics, angiography and magnetization transfer contrast, artifacts, instrumentation, safety and bioeffects. (16 hours)

Expected course outcomes:

- Able to explain x-ray production and its physics, different types of x-ray tubes and x-ray generators.
- Able to handle different image receptor systems like screen film radiography, latent image formation, film processing, dark room and film characteristics.

STANDARD BOOKS FOR STUDY AND REFERENCES

1. Diagnostic radiology for teachers and students, IAEA Publication, Pub1564
2. N. Smith and A. Webb , Introduction to Medical Imaging Physics, Engineering and Clinical Applications 2011,Cambridge University Press
3. W.J. Meredith and J.B. Massey "Fundamental Physics of Radiology" John Wright and Sons, UK, 1989
4. Christensen 'Physics of Diagnostic Radiology' Lea and Febiger – Philadelphia (1990).
5. W.R. Hendee, "Medical Radiation Physics", Year Book – Medical Publishers Inc. London, 1981
6. P. Sprawls, Magnetic Resonance Imaging: Principles, Methods and Techniques, Medical Physics Publishing, Madison (2000)

Course Code	Thermal Physics
20213DSC44C	

Course Objectives:

- To study fundamentals of thermodynamics.
- To study statistical behavior of many particle systems.

Course Outcomes:

- CO1: Apply the laws of thermodynamics to heat engines and estimate thermal efficiency.
- CO2: Understand the interrelationship between thermodynamic functions and ability to use such relationship to solve practical problem.
- CO3: Remember the laws of thermal radiation.
- CO4: Analyze in depth about statistical radiation and the basic ideas about different statistics

MODULE I : KINETIC THEORY OF GASES

(15 Hrs)

Introduction – Deduction of Maxwell’s law of distribution of molecular speeds, Transport Phenomena – Viscosity of gases – thermal conductivity – diffusion of gases.

THERMODYNAMICS:

Basics of thermodynamics-Kelvin’s and Clausius statements – Thermodynamic scale of temperature – Entropy, physical significance – Change in entropy in reversible and irreversible processes – Entropy and disorder – Entropy of universe – Temperature-Entropy (T-S) diagram – Change of entropy of a perfect gas-change of entropy when ice changes into steam.

MODULE II: THERMODYNAMIC POTENTIAL AND MAXWELL’S EQUATIONS

(15 Hrs)

Thermodynamic potentials – Derivation of Maxwell’s thermodynamic relations – Clausius-Clayperon’s equation – Derivation for ratio of specific heats – Derivation for difference of two specific heats for perfect gas. Joule Kelvin effect – expression for Joule Kelvin coefficient for perfect and Vanderwaal’s gas.

LOW TEMPERATURE PHYSICS:

Joule Kelvin effect – liquefaction of gas using porous plug experiment. Joule expansion-

Distinction between adiabatic and Joule Thomson expansion – Expression for Joule Thomson cooling – Liquefaction of helium, Kapitza's method – Adiabatic demagnetization – Production of low temperatures – Principle of refrigeration, vapour compression type.

MODULE III : QUANTUM THEORY OF RADIATION:

(15 Hrs)

Black body-Ferry's black body – distribution of energy in the spectrum of Black body – Wein's displacement law, Wein's law, Rayleigh-Jean's law – Quantum theory of radiation - Planck's law – deduction of Wein's distribution law, Rayleigh-Jeans law, Stefan's law from Planck's law. Measurement of radiation using pyrometers – Disappearing filament optical pyrometer – experimental determination – Angstrom pyroheliometer - determination of solar constant, effective temperature of sun.

MODULE IV: STATISTICAL MECHANICS (15 Hrs)

Introduction, postulates of statistical mechanics. Phase space, concept of ensembles and some known ensembles ,classical and quantum statistics and their differences, concept of probability, Maxwell-Boltzmann's distribution law -Molecular energies in an ideal gas- Maxwell-Boltzmann's velocity distribution law, Bose-Einstein Distribution law, Fermi-Dirac Distribution law, comparison of three distribution laws, Application of B-E distribution to Photons-planks radiation formula, Application of Fermi-Dirac statistics to white dwarfs and Neutron star.

Textbooks:-

1. Fundamentals of Physics. Halliday/Resnick/Walker.C. Wiley India Edition 2007.
2. Second Year Physics –Telugu Academy.
3. Modern Physics by R. Murugeshan and Kiruthiga Siva Prasath (for statistical Mechanics)S.Chand & Co.
4. Heat and Thermodynamics by Mark W.Zemansky 5thedition McGraw -Hill
5. Heat and Thermodynamics by D.S. Mathur.

Reference Books:-

1. Modern Physics by G. Aruldas and P. Rajagopal,Eastern Economy Education.
2. Berkeley Physics Course. Volume-5. Statistical Physics by F. Reif. The McGraw-HillCompanies.
3. An Introduction to Thermal Physics by Daniel V. Schroeder.Pearson Education LowPrice Edition.

4. Thermodynamics by R.C. Srivastava, Subit K. Saha & Abhay K. Jain Eastern Economy Edition.
5. Modern Engineering Physics by A.S. Vasudeva, S.Chand & Co. Publications.
6. Feynman's Lectures on Physics Vol. 1, 2, 3 & 4. Narosa Publications.
7. Fundamentals of Optics by Jenkins A. Francis and White E. Harvey, McGraw Hill Inc.
8. B.B. Laud "Introduction to statistics Mechanics" (Macmillan 1981)
9. F.Reif: "Statistical Physics" (Mcgraw-Hill, 1998)
10. K.Haung: "Statistical Physics" (Wiley Eastern 1988)



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TIRANJAVUR - 613 403 - TAMIL NADU

Subject Code	Subject Name
22513MFP	Certificate course on mathematical foundation for physics

Syllabus

COURSE OBJECTIVES:

- > To equip students with the mathematical techniques needed for understanding theoretical treatment in different courses taught in their program
- > To extend their manipulative skills to apply mathematical techniques in their fields
- > To help students apply Mathematics in solving problems of Physics

Unit I: Differential Calculus

Limits and differentiation-Derivative of functions- Derivative interactive graphs-Differential Equations in Physics

Unit II: Integral Calculus

Finite sums- Limits of finite sums-Definite integrals- Integration of functions-Fundamental theorem of calculus

Unit III: Determinant and Matrix

Basics of determinants and matrices-Types of matrices- Simultaneous linear equations- Eigenvalue and eigenvectors-Matrices in Physics

Unit IV: Vector Calculus Differentiation of vectors-Gradient, divergence, curl-Integration of vectors-line, surface and volume integral

Unit V: Few Basic Functions in Physics Plotting of functions-Beta and Gamma Function-
Riemann Zeta Function-Dirac Delta Function

Probability and Statistics Probability, Multiplicity, Combinatorics-Bernoulli
Distribution-Poisson and Gaussian Distribution-Boltzmann, Power Law, Lorentzian
Distribution

Course Outcomes

At the end of the course, trainees/students will be able to:

1. Understand use of differential calculus and be able to apply them in real problem
2. Able to understand integral calculus, do integration.
3. Analyze characteristics of matrices and its different types, and the process of diagonalization.
4. Solve differentiation and integral of vectors



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TIRUVANANTHAPURAM - 611 340 - TAMILNADU

Subject Code	Subject Name
22513OFT	Certificate course on industry linked optical fiber technology

Syllabus

COURSE OBJECTIVES:

1. To realize the significance of optical fiber communications.
2. To understand the construction and characteristics of optical fiber cable.
3. To develop the knowledge of optical signal sources and power launching.
4. To identify and understand the operation of various optical detectors.
5. To understand the design of optical systems and WDM.

Unit 1- Introduction

Need for optical communication, salient features of optical fibers, ray theory of light guidance, numerical aperture, modes of a fiber, single and multimode fibers, step-index and graded-index fibers.

Transmission characteristics of optical fibers, attenuation, pulse broadening mechanism, intermodal dispersion, bit rate - length product, material dispersion.

Unit 2- Basic Optical Communications Concepts

P2P System, Transmitter, Light Source, LED, Laser Diode, Detector, PIN diode, Avalanche Photo Diode, Optical Amplifiers, EDFA, PDFA, Regeneration, ADM, OADM, Digital Cross Connect, RPR Ring.

Unit 3- Optical Fiber

Core, Cladding, Primary Buffer, Types of Fibers, Silica Core Silica Cladding, Silica Core, Plastic Cladding (PCS), Plastic Core Plastic Cladding (POF), fiber fabrication techniques.

Unit 4- Cable Splicing

Fusion Splicing, Mechanical Splicing, Single Fiber Fusion Splicing, Mass Fusion Splicing, Stages of Splicing, Splicing Precautions, Misalignment, End Gap, End Angle, NA Mismatch, Core Mismatch, Waisting, Bulging, Axial Run-out, Bubble, Incomplete Fusion

Unit 5- Testing of Cables

Continuity Test, Light Source- Power Meter, OLTS, Visual Fault Locator, OTDR Testing, Measuring Cable Span, Attenuation Coefficient, Connector/ Splice Loss Measurement, Distance to Fault, OTDR Trace Analysis, Optical Loss Budget.

TEXT BOOKS:

1. Optical Fiber Communications – Gerd Keiser, Tata Mc Graw-Hill International edition, 4th Edition, 2008.

2. Optical Fiber Communications – John M. Senior, PHI, 2nd Edition, 2002. REFERENCE

BOOKS:

1. Fiber Optic Communications – D.K. Mynbaev, S.C. Gupta and Lowell L. Scheiner, Pearson Education, 2005.

2. Text Book on Optical Fibre Communication and its Applications – S.C. Gupta, PHI, 2005. 3.

Fiber Optic Communication Systems – Govind P. Agarwal, John Wiley, 3rd Edition, 2004.

4. Fiber Optic Communications – Joseph C. Palais, 4th Edition, Pearson Education, 2004.

COURSE OUTCOMES:

At the end of the course the student will be able to:

1. Understand and analyze the constructional parameters of optical fibers.
2. Be able to design the optical system.
3. Estimate the losses due to attenuation, absorption, scattering and bending.
4. Compare various optical detectors and choose suitable one for different applications.



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Subject Code	Subject Name
22513SPS	Certificate course on Installation and maintenance of solar photovoltaic systems

Syllabus

Course Objectives:

The main objectives of this course are to:

1. To make student to understand the importance of solar energy and its effective utilization.
2. To bring exposure to various tools and equipment used for Solar Photovoltaic installation.
3. To get hands-on training on the installation and maintenance of Solar Photovoltaic Systems.
4. To bring knowledge on the possibility of Employability and Entrepreneurship avenues in the area of solar energy extraction and utilization.

Unit 1- Introduction

An Introduction: Energy from the Sun-Sun Path Diagram and Solar Radiation

Unit 2- Fundamentals of Solar Photovoltaic Systems

Components of a Solar PV System-Types of Solar Photovoltaic Systems-Technical Parameters and Performance of a Solar PV Panel. Identification and Uses of Tools and Equipment Used for Solar PV Installation.

Unit 3- Installation of Solar Photovoltaic Systems

The Importance of Accurate Load and Site Assessment-Steps for Conducting a Load Assessment-Steps for Conducting a Site Assessment-Procurement of the Solar PV System Components- Civil and Mechanical Parts of Solar PV System-Construction of Equipment

Unit 4- Components of Solar Photovoltaic Systems

Foundation-Installation of Mounting System, Photovoltaic Module and Battery Bank and inverter stands. Installation of Electrical Components, Conduits, Cables- Installation of Grounding Systems and Battery Bank.

Unit 5- Test & Measurement and Maintenance of Solar Photovoltaic Systems

Tools and Accessories Required for PV System Testing-Overall System Inspection-Testing of Solar Array- Wire and Earthing Continuity Tests-Testing of Charge Controller-Testing of Batteries-Start-up the System-Unintentional Islanding Functionality Tests-Sample Test and Commission Record Sheet-Tools Required for Maintenance-Preventive Maintenance of PV System-Troubleshooting and Maintenance.

Course Outcomes

At the end of the course, trainees/students will be able to:

- 1 Gain knowledge on renewable energy sources, solar PV systems, potential, and applications.
- 2 Analyze the solar geometry, system parameters, challenges, and opportunities.
- 3 Understand the system sizing, costing, installation, and operation with and without storage systems.
- 4 Development of solar PV systems for domestic, commercial, and industrial applications.
- 5 Performance analysis of a solar PV system for livelihood development.
- 6 Develop an understanding of the perspective on SDGs 7, 8, and 13.

References

1. Solar energy by Sukhatme, Tata McGraw-Hill Education, 1987.
2. Solar Energy Utilization Edited by Hafit Yüncü, E. Paykoc, Y. Yener, Springer Netherlands, 1987.
3. Solar Energy Utilization: A Textbook for Engineering Students by G. D. Rai Khanna Publishers, 1987.



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THANJAVUR - 613 401 - TAMILNADU
Department of Physics

Subject Code	Subject Name
22513DC	Certificate course on installation and maintenance of digital circuits

Total : 45 hours

Syllabus

Course Objectives:

The main objectives of this course are to:

1. To make student to understand the importance of digital electronic circuits
2. To bring exposure to various tools and equipment used for installation of digital electronic circuits.
3. To get hands-on training on the installation and maintenance of digital electronic circuits.
4. To bring knowledge on the possibility of Employability and Entrepreneurship avenues in the area of digital electronic circuits.

Unit 1

Digital System and Binary Numbers: Number System and its arithmetic, Signed binary numbers, Binary codes, Cyclic codes, Hamming Code, the map method up to five variable, Don't care conditions, POS simplification, NAND and NOR implementation, Quine McClusky method (Tabular method).

Unit 2

Combinational Logic: Combinational Circuits: Analysis Procedure, Design procedure, Binary addersubtractor, Decimal adder, Binary multiplier, Magnitude comparator, Multiplexers, Demultiplexers, Decoders, Encoders.

Unit 3

Sequential Logic and Its Applications: Storage elements: latches & flip flops, Characteristic Equations of Flip Flops, Flip Flop Conversion, Shift Registers, Ripple Counters, Synchronous Counters, Other Counters: Johnson & Ring Counter.

Unit 4

Synchronous & Asynchronous Sequential Circuits: Analysis of clocked sequential circuits with state machine designing, State reduction and assignments, Design procedure. Analysis procedure of Asynchronous sequential circuits, circuit with latches, Design procedure, Reduction of state and flow table, Race-free state assignment, Hazards.

Unit 5

Memory & Programmable Logic Devices; Digital Logic Families: DTL, DCTL, TTL, ECL & CMOS etc., Fan Out, Fan in, Noise Margin; RAM, ROM, PLA, PAL; Circuits of Logic Families, Interfacing of Digital Logic Families, Circuit Implementation using ROM, PLA and PAL; CPLD and FPGA.

Course Outcomes

At the end of the course, trainees/students will be able to:

- 1 Apply concepts of Digital Binary System and implementation of Gates.
- 2 Analyze and design of Combinational logic circuits.
- 3 Analyze and design of Sequential logic circuits with their applications
- 4 Implement the Design procedure of Synchronous & Asynchronous Sequential Circuits
- 5 Apply the concept of Digital Logic Families with circuit implementation

References

1. M. Morris Mano and M. D. Ciletti, "Digital Design", Pearson Education.
2. David J. Comer, "Digital Logic & State Machine Design", Oxford University Press.
3. RP Jain, "Modern Digital Electronics", Tata McGraw Hill Publication.



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THANJAVUR - 613403 - TAMILNADU
Department of Physics

Subject Code	Subject Name
22513DC	Certificate course on microcontroller

Total : 45 hours

Syllabus

Course Objectives:

The main objectives of this course are to:

1. To make student to know the significance of microcontroller
2. To convey details about several tools about microcontroller
3. To acquire hands-on training on the maintenance of microcontroller
4. To transfer knowledge on the possibility of Employability and Entrepreneurship avenues in the field of microcontroller

Unit 1

Block diagram of microcontroller: CPU, input device, output device, memory and buses, common features of Microcontrollers: On-chip Oscillator, program and data memory, I/O Ports, Watchdog-timer reset, SFRs, Timers, Counters, Interrupts, ADC, PWM, microprocessor and microcontroller, Hierarchy of microcontrollers, architectures of microcontroller Harvard, Von Neumann RISC and CISC, Applications: House hold, Communication, Office equipment and industrial automation

Unit 2

Blocks of Microcontroller 8051: ALU, PC, DPTR, PSW, Internal RAM, Internal ROM, Latch, SFRs, General purpose registers, Timer/Counter, Interrupt, Ports, Functions of each pin of 8051 Clock circuit, reset Circuit, phase and state in machine cycle of 8051, Memory organization of 8051: Program and Data memory Map, External Memory Addressing and Decoding Logic of 8051, Stack, Stack Pointer and Stack operation, Timers/Counters logic diagram and its operation in various modes, I/O Ports structure: Port 0, Port 1, Port 2, Port 3, Serial Communication in various modes, Interrupt structure, vector address, priority and operation

Unit 3

Addressing Modes: Immediate, Register, Direct, Indirect, Indexed, Relative and bit addressing, Instruction set: Data Transfer, Arithmetic, Logical, Branching, and Machine Control, Looping, Counting, sorting and Indexing, Data manipulation, Masking, Stack operation, Conditional programming, Configuration and programming of Timer/Counter using SFRs: TMOD, TCON,

THx, TLx., Configuration and programming of interrupts using SFRs: IE,IP,Configuration and programming of I/O Port : P0,P1,P2,P3

Unit 4

Switch: Pushbutton, DIP, Thumbwheel, Tilt, Relay,LED,7 segment LED, LCD, ADC0804, Temperature sensor LM35, DAC0808, ADC0804, Damper Control, Hoper Control, DC Motor, Stepper motor, Serial communication using MAX 232,Hyperterminal

Unit 5

Application of microcontroller in various field - Using LM35, ADCC0804, Microcontroller, 7 segment LED - Using Analog Multiplexer 4051,ADC0804, Microcontroller, 7 segment LED,MAX232 - Using GSM Modem, Microcontroller, Relay, Switches - Using Photo interrupter, Microcontroller, 7 Segment LED - Using Pushbutton switches, Microcontroller, Relay, NVRAM.

Course Outcomes

- i. At the end of the course, trainees/students will be able to:
 - 1 Identify features of various microcontroller
 - ii. Select appropriate microcontroller for different application
 - iii. Interface microcontroller with hardware for given application
 - iv. Write and execute assembly language programs(software) for given application
 - v. Develop small microcontroller based applications.

References

1. Microcontrollers : Principles And Applications Pal Aji EEE, PHI ,New Delhi,(Latest edition)
2. The 8051 Microcontrollers: Architecture, Programming and Applications Rao Dr. K Uma Pearson Education India, New Delhi,(Latest edition)
3. The 8051 microcontroller and embedded systems Mazidi Ali, Muhammad Mazidi Gillispie Janice PHI, New Delhi,(Latest edition)
4. The 8051 Microcontroller: Architecture, Programming, and Applications Kenneth Ayala J. Thomson Delmar learning,(latest Edition)
5. The 8051 Microcontroller, Mackenzie Pearson Education India, New Delhi,(Latest edition)
6. Programming and customizing the 8051 microcontroller Predko Michael McGraw-Hill, International edition

CRYSTAL GROWTH ANALYSIS

Course Objectives:

This course is designed to provide a detailed study on Ceramic materials and their applications in devices. The prerequisite for this would be to do a first course on concepts of materials science.

Course Outcomes:

At the end of this course, students will have a thorough knowledge of functional ceramic materials. Know the methods of synthesis of functional ceramics. Acquire knowledge of how to choose ceramic materials for specific applications.

Unit I - Thermodynamics of Crystal Growth

Saturation and super saturation – solubility curve – expression for super saturation–solubility diagram –nucleation – Theories of nucleation – Gibbs Thomson equation for vapour –Modified Thomson's equation for melt – Gibbs Thomson equation for solution – Kinetic of crystal growth– Single and rough faces – Models of surface roughness - KSU theory and BCF theory.

Unit II - Growth from solutions

Low temperature solution growth; Slow cooling process – solvent evaporation process –Temperature difference process – Use of electrolytic process high temperature solution growth: Solvent & solutions - slow cooling methods – temperature difference methods – high pressure method – solvent evaporation method – electrolytic process - liquid phase epitaxial.

Unit III - Growth from melt

Bridgeman and related techniques – crystal pulling – convection in melts – modeling and simulation of bulk crystal growth considering melt growth – czochralski technique – zone melting technique – skull melting process – verneuil process-Heat exchange method.

Unit IV - Other Crystal Growth Techniques

Physical vapour deposition-chemical vapour deposition – chemical vapour transport –definition – fundamentals – choice of transport reactions – specifications – Transported materials and agents-STP,LTVTP,OTP-Hydrothermal growth: Design aspect of autoclave-electro crystallization-Gel method: principle-types of gels-structure of gels-growth in gels-experimental procedure-biological crystallization.

Unit V - Analysis and Characterization of Crystals

Optical transmission studies (UV) Micro hardness studies-Structural analysis-XRD-Fourier Transform-IR-Spectral analysis-Scanning Electron Microscope (SEM)-different etching techniques.

Books for Reference:

1. Brice J.C. Crystal Growth Processes, John Wiley & sons , New York 1986,
2. Santhanaraghavan P, Ramasamy - P, Crystal Growth – Process and Methods, KRU Publications, Kumbakonam, 2000.
3. Buckley H.E, Crystal Growth, John Wiley & Sons, New York, 1986.
4. Gilman J, The Art of Science of Growing Crystals, John Wiley & Sons, New York, 1956.
5. William Kemp, Organic spectroscopy, 3 rd Edition, , Palgrave, New York, 2004.

Semiconductor Physics

Course Objectives:

Learn basics in analytical techniques. Characterize the structures and chemistries of materials. Select the proper characterization technique to solve problems in research and/or industry.

Course Outcomes:

The students will learn materials characterization techniques and use this knowledge to choose appropriate technique: Surface, interfaces and thin films characterization; Metals, ceramics, polymers, semiconductors and composite characterization.

UNIT – I: CIRCUIT ELEMENTS:

Resistance in series and parallel – Capacitor in series and parallel – Conversion of galvanometer into voltmeter – Conversion of galvanometer into ammeter – Multimeter – CRO, AFO (Qualitative study only).

UNIT – II: ELECTRICITY:

Ohm's law – Kirchof's law – Wheatstone bridge – condition for bridge balance – Meter bridge – Specific resistance – Temperature co-efficient of resistance – Potentiometer – Measurement of current – voltage and resistance.

UNIT – III: SEMICONDUCTORS:

Conductors, Insulators, Semiconductors, P-type, N-type – semiconductors – PN-Junction diode – Zener diode – Static characteristics – Voltage regulation – Rectifiers: – Half wave rectifiers – Bridge Rectifiers – Calculation of ripple factor and efficiency.

UNIT – IV: BREAK DOWN DEVICES:

FET – Design of FET – FET characteristics – working of FET – SCR – Design – Characteristics – Triac – design and characteristics – Diac – design and characteristics.

UNIT – V: OPTO ELECTRONIC DEVICES:

LED – voltage and current – Advantages and applications of LED – LCD – Photo diode – its operation and application – Phototransistor – LED as Seven segment display.

REFERENCE BOOKS:

- 1) Electricity and Magnetism by Brijlal and Subramaniam.
- 2) Principles of electronics by V.K. Mehta.

PONNAIYAH RAMAJAYAM INSTITUTE OF SCIENCE AND TECHNOLOGY (PRIST)
PRIST Deemed to be University
School of Education
Department of Education

Minutes of the meeting of the Board of Studies (BoS)*

Date: 09 .05. 2022

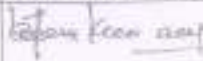
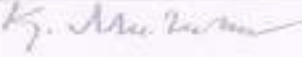
Venue: Silver Jubilee Seminar Hall, First floor (CRD)

Time: 11.00 am


Members present:

Chairman: Dr.R.Gunasekaran
M.Sc , M.Ed, M. Phil, Ph.D.,
Head & Professor
School of Education
PRIST Deemed to be University

External Members








S.No.	Name/Degree/Designation	Institute/Organization/ Full address	Online/ Physical	Signature (scan, if online)
1	Dr. N.Sasikumar M.Sc ,M.Ed, M.Phil.,Ph.D Associate Professor, Head, Department of Education, Alagappa University, Karaikudi	Head, Department of Education, Alagappa University, Karaikudi	Physical	 Dr. N. SASIKUMAR, M.Sc, M.Sc(Psy), M.Ed, M.Phil, Ph.D Assistant Professor Department of Education Alagappa University Karaikudi - 630 003
2	Dr.K. Muthusamy M.Com, M.Ed, M.Phil, Ph.D., Principal, Annai Fathima College of Education, Kumbakonam	Principal, Annai Fathima College of Education, Kumbakonam.	Physical	 Dr. K. MUTHUSAMY, M.Sc, Ph.D, M.Ed, M.Phil, Ph.D PRINCIPAL, ANNAI FATHIMA COLLEGE OF EDUCATOR, SIVLACHIN, KUMBAKONAM-612001

Internal Members


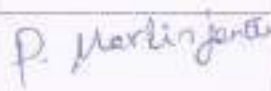
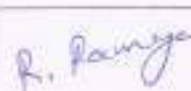
S.No.	Name/Degree/Designation	Department	Online/ Physical	Signature (scan, if online)
1	Dr.R.Gunasekaran M.Sc , M.Ed, M. Phil, Ph.D., Head & Professor	Department of Education	Physical	 09.05.2022

↓
HOD,
School of Education
PRIST Deemed to be University
THANJAVUR - 613 403.


DEAN,
School of Education
PRIST Deemed to be University
THANJAVUR - 613 403.

2	Dr.P.Rajasekar M.A , M.Ed,M. Phil, Ph.D.,Professor	Department of Education	Physical	
3	Dr.K.B.Jasmine SuthandiraDevi M.A , M.Ed,M. Phil, Ph.D.,Professor	Department of Education	Physical	
4	Dr.M.Balasubramanian M.A , M.Ed,M. Phil, Ph.D.,Associate Professor	Department of Education	Physical	
5	Dr.M.Aron Antony CharlesM.Sc , M.Ed,M. Phil, Ph.D., Associate Professor	Department of Education	Physical	
6	Dr.S.Selvaraj M.A,M.Ed, M.Phil, Ph.D., Assistant Professor	Department of Education	Physical	
7	Mrs.R.Vaishnavi M.A.M.Ed , M. Phil, Assistant Professor	Department of Education	Physical	
8	T.Selvaraj M.Sc ,M.Ed, M. Phil, Assistant Professor	Department of Education	Physical	

Invited Participants

S.No.	Name/Degree/Designation	Department/Class Institute/Organization/Address	Online/ Physical	Signature (scan, if online)
1	Dr.Chinnappa M.Sc,M.Ed.,M.Phil,Ph.D.,PCIDCA Dean, School of Arts and Science, PRIST Deemed to be University, Thanjavur	Dean, School of Arts andScience, PRIST DEEMED TO BE UNIVERSITY, Thanjavur	Physical	
2	P. Merlin Jenita M.A.,B.Ed., II - M.Ed Student Teacher,Pomniya Ramajayam CBSC Public School, Thanjavur.	PRIST DEEMED TO BE UNIVERSITY, Thanjavur	Physical	
3	R.Ramya B.Sc II - B.Ed Student	PRIST DEEMED TO BE UNIVERSITY, Thanjavur	Physical	

Agenda

1. Confirmation of the previous Meeting Minutes
2. Action taken on the previous Meeting Minutes
3. To scrutinize the stakeholder feedback on B.Ed. and M.Ed. curriculum

4. To consider about inclusion of syllabus in Pedagogy subjects based upon the Tamil nadu Text book society
5. To consider the introduction of employment oriented add on courses
6. To consider the introduction to new course.
7. To consider the introduction to value added course.
8. To recommend the panel of examiners for B.Ed. & M.Ed.
9. Any other matter

SCHOOL OF EDUCATION
Department of Education
Minutes of the Board of Studies

The Board of Studies meeting was held on 09.05.2022. The Chairman Dr.R.Gunasekaran Welcomed the members to Board of studies and outlined the changes to be made in the following for the board approval.

Item 1. To consider change in the Curriculum, Scheme of Examination and Syllabi of B.Ed & M.Ed course and approval.

Item 2. To suggest the panel of names for appointment of examiners.

Item 3. Other academic activities in the department.

As per the suggestions and recommendations given by the Stakeholders on the above items discussed, the existing/revised Scheme of Curriculum/Scheme of Examination syllabi and Panel of Examiners are to be followed is annexed herewith for the implementation from the commencement of the Academic year 2021-2022.

The members after careful scrutiny of the changes to be made unanimously accorded approval for the proposed changes/modifications. They also resolved to authorize the Chairman of Board of Studies to place the changes/modifications now approved by the BOS before the Standing Committee on Academic affairs and Academic Council.

The Regulations and Syllabus for B.Ed. and M.Ed. Courses were discussed in the BOS.

Agendum 1: Confirmation of the previous Meeting Minutes	
Discussion: The minutes of the 7 th Board of Studies meeting held on 13 th July 2021 were communicated to the members. The comments received have been incorporated and placed for confirmation. The same was approved by the 7 th Academic council.	
Resolution: Resolution: The coordinator read the minutes of earlier meeting and the minutes were Reviewed and passed by the members.	
Agendum 2: Action taken on the previous Meeting Minutes	
Discussion: The details of the action taken were presented to the members	
Resolution: The members expressed satisfaction over the action taken	
Agendum 3: To scrutinize the stakeholder feedback on B.Ed and M.Ed curriculum	
Discussion	<ol style="list-style-type: none"> 1. Introducing the changes of new trends of curriculum in the pedagogy subjects 2. More appropriate topics should be added for M.Ed. curriculum based upon the recent trends 3. For B.Ed. and M.Ed. regular TET and TRB coaching hours should be added 4. To introduce the Psychology practical record in the curriculum for M.Ed.
Resolution	The board unanimously resolved to make necessary changes as requested by the stake holders

Agendum 4: To consider about inclusion of syllabus in Pedagogy subjects based upon the Tamilnadu Text book society
Discussion The Tamil-nadu text book society changed the school syllabus frequently so B.Ed. pedagogy curriculum syllabus also modify based upon the resent trends
Resolution The members of the board resolved to approve the modified syllabus of the pedagogy subjects in the B.Ed. curriculum
Agendum 5: To consider the introduction of employment oriented add on courses.
Discussion The existing syllabus gives enough opportunity for employability and there was no urgent need to introduce new add-on courses. Also it was pointed out that, the syllabus should be revised compulsorily next year based upon the new education policy
Resolution: Resolved to introduce some more employment oriented add on courses in the next BOS meeting
Agendum 6: To consider the introduction to new course
Discussion The board members give syllabus new course for B.Ed : Childhood and Growing up, Value and Peace Education, Teaching and Learning, Pre - Primary Education, Disaster Management, Professional Course for Teacher Proficiency, Strengthening Language Proficiency, Gender Issues in Education, Understanding the self, Addressing Special needs in Classroom M.Ed new course: Early Child Care and Education, Inclusive Education, Pre - Service and In-service Teacher Education, Sociology of Education, Educational Measurement and Evaluation, Educational Studies, Comparative Education, ICT on Teaching and Learning, Crucial Understanding of ICT and Cyber Security.
Resolution: Resolved to introduce new course in the next BOS meeting
Agendum 7: To consider the introduction to value added course
Discussion The existing syllabus gives enough name of the Value added course Educational and Socialization, NCC, Health and Well-Being, Modern Pedagogical Techniques, Technical Writing.
Resolution: Resolved to introduce some more employment oriented Value added courses in the next BOS meeting
Agendum 8: To recommend the panel of examiners for B.Ed. & M.Ed.
Discussion Members suggested the names of the experts who would serve as panel of examiners for B.Ed. and M.Ed. Programme
Resolution: The BOS approved a tentative list of subject experts for paper setting, moderation and Examiners. If required few more experts may be included with the permission of the Concerned authorities.
Agendum 9: Review Of Curriculum & Syllabus In B.Ed-Regulation - 2022



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Discussion

- To discuss the modifications in the syllabi for First and Second Year curriculum
- As such, the curriculum is revisited and certain sweeping changes have been made – by introducing new courses and improvising the syllabi of many courses. The honorable members Board of Studies have expressed their appreciations for the changes made commenting that they address the current demands of the education Profession.

Resolution:

Resolved to Improvements in Course Contents of the following paper B.Ed (B.Ed. I,II,III and IV semester)I - Semester

Group – A: Perspectives in Education

	Course Code	Course Title	Revision
Group – B: Curriculum	22130PE11	Psychology of Learners and	I - semester
	22130PE12	Learning Assessment for Learning	I - semester
	22130CP13A	And Pedagogic studies	
	22130CP13A	Pedagogy of Tamil: Part - I	I - semester
	22130CP13B	Pedagogy of English: Part - I	I - semester
	22130CP13C	Pedagogy of Mathematics: Part - I	I - semester
	22130CP13D	Pedagogy of Physical Science: Part - I	I - semester
	22130CP13E	Pedagogy of Biological Science: Part - I	I - semester
	22130CP13F	Pedagogy of Computer Science: Part - I	I - semester
	22130CP13G	Pedagogy of Social Science: Part - I	I - semester
	22130CP13H	Pedagogy of Commerce and Accountancy : Part - I	I - semester
	22130CP13I	Pedagogy of Economics: Part - I	I - semester
22130CP13J	Pedagogy of History: Part - I	I - semester	
22130CP13K	Pedagogy of Geography: Part - I	I - semester	
		II - Semester	
S.NO.			
	Course Code	Course Title	Revision
Group –A	Perspectives in Education		
	22130PE21	Contemporary India and Education	II - semester
	22130PE22	Teaching and Learning	II - semester
Group – B:	Curriculum and Pedagogic studies		
	22130CP23A	Pedagogy of Tamil: Part – II	II - semester



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22130CP23B	Pedagogy of English: Part - II	II - semester
22130CP23C	Pedagogy of Mathematics: Part - II	II - semester
22130CP23D	Pedagogy of Physical Science: Part - II	II - semester
22130CP23E	Pedagogy of Biological Science: Part - II	II - semester
22130CP23F	Pedagogy of Computer Science: Part - II	II - semester
22130CP23G	Pedagogy of Social Science: Part - II	II - semester
22130CP23H	Pedagogy of Commerce and Accountancy : Part - II	II - semester
22130CP23I	Pedagogy of Economics: Part - II	II - semester
22130CP23J	Pedagogy of History: Part - II	II - semester
III - Semester		
Group ->A	Perspectives in Education	Revision
22130PE31	Knowledge and Curriculum	III - semester
IV - Semester		
Group ->A	Perspectives in Education	
22130PE43	Language across the Curriculum	IV - semester
<u>Review Of Curriculum & Syllabus In M.Ed - Regulation 2022</u>		
Resolved to introduce the following Courses in the M.Ed programme curriculum with effect from 2022-23		
Course Code	Course Title	Revision
22230TE14	Teacher Education In India Elementary & Secondary Level	
22230SC15A	Early Child Care and Education	
II - Semester		
22230PC21	Philosophy of Education	

22230SC25B Pre-service and In-service Teacher Education
III - Semester

22230PC31 Sociology of Education

22230TC33 Educational Measurement and Evaluation
IV - Semester

22230PC41 Educational Studies

22230PC42 Comparative Education

22230TC43 ICT on Teaching and Learning
ONLINE COURSE (CHOICE BASED)

MOOC SWAYAM -I Course (Not less than 4 weeks)

Signature:



Chair/HoD:

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Department of Education

Name: *Dr. M. Aron Antony Charles*

Date: *09.05.22*

Mandatory Attachments:

1. Minutes of the previous BoS meeting minutes and report on the follow-up action taken.
2. BoS Meeting 'Notification' sent to all members, including online meeting link.
3. Online Screenshots and geo-tagged photos in the venue.
4. Attendance sheet print of online attendees.
5. Detailed syllabi with PEOs, POs, COs, etc. (in Annexures), if new Programme(s) introduction /Curriculum revision is discussed.

Note: The 'minutes' of the BoS meeting along with the attachments as listed above must be mailed to the Registrar by the HoD within three days after the meeting, copying Dean concerned, Dean - Academic Affairs and the VC's office.


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Signature:



Dean:

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School of Education

Name: *Dr. R. Gunasekaran*

Date: *09-05-2022*


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PRIST DEEMED TO BE UNIVERSITY
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VALUE ADDED COURSE
Course code: 22130VAC1 - Education and Socialization

Objectives:

- To enable the teacher trainees undertake action research to solve their professional problems.
- To reduce the gap between theory and practice, teacher and education curriculum and school realities.
- The course (B.Ed.,) will provide adequate theoretical orientation regarding the objectives of education in the Indian Background.

Unit - I : Introduction : Conceptual clarity, Relationship between society, Education and Development.

Unit - II : Socialization and Education : Relations between socialization and Education, Agencies of socialization and Education: Family, Peer Groups, School and Media

Unit - III : Education, Inequalities and Social Justice: Concept of Equality of Educational Opportunity, Education and Disparities: Caste, Class, tribe, gender, rural-urban, Education and social mobility

Unit - IV : Emerging Trends in Education in India: School education: Existing scenario, Higher Education in India. Governance of Higher Education: Institutional programmes, National Educational policy 1986.

Outcomes:

- Applying teaching skills and dealing with classroom problems
- Evolving a system of education which enhances the potential of every learner to acquire, retain and transform knowledge leading to wisdom society through creative, experiential and joyful modes of learning.
- Transform the educational landscape by providing open access to quality, value based and socially relevant education to all by harnessing the disruptive potential of AI.
- Analysis of Curriculum, construction of blue print, selecting appropriate teaching strategies according to needs of students and conducting action research to solve classroom problems.

Reference book:

- Roberta Bemis: Wadsworth Publishing Co Inc; 8th ed. edition (26 January 2009); CBS Publishers & Distributors Pvt. Ltd -PH: 011-49344934 ISBN-13 : 978-0495603252
- Grusec, J.E., Lytton, H. (1988). Socialization and the Family. In: Social Development. Springer, New York, NY. https://doi.org/10.1007/978-1-4612-3768-6_5
- Psychology Press Ltd; 1st edition (28 November 2012) SBN-13 : 978-0415651769


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PRIST DEEMED TO BE UNIVERSITY
SCHOOL OF EDUCATION
VALUE ADDED COURSE
Course code: 22130VAC2 - NCC

Objectives:

- To enable the teacher trainees undertake action research to solve their professional problems.
- To reduce the gap between theory and practice, teacher and education curriculum and school realities.
- The course (B.Ed.) will provide adequate theoretical orientation regarding the objectives of education in the Indian Background.
- National Integration: Importance and Necessity

UNIT-I: The NCC

Aim and Objectives of NCC – Organization and Trainings and NCC Song

Incentives – National integration and Awareness- National Integration: Importance and Necessity.

Freedom Struggle and Nationalist Movement in India

UNIT- II: Drill, Weapon Training

Characteristics of a rifle and its ammunition- Stripping, assembling, care and cleaning of 22 Rifle

Loading, cocking and unloading-Different positions for holding and aiming

UNIT- III: Personality Development and Leadership

Introduction to Personality development-Communication skills - Leadership traits-Time

management- Disaster Management and Civil Affairs-types of Emergencies and Nature of Disasters-

Assistance during natural and other calamities: Floods, Cyclones, Earth quakes, Accidents.

UNIT- IV: Social Awareness Community Development-Basics of Social Service and its needs

Contribution of youth towards social welfare-Civic responsibilities- Health and Hygiene

Hygiene and sanitation-Infectious and contagious diseases and its prevention.

UNIT- V: Adventure and Obstacle Training-Obstacle training- Environment Awareness and

Conservation-Natural resources-conservation and management-Water conservation and rain water

Harvesting.

Outcomes:

- Transform the educational landscape by providing open access to quality, value based and socially relevant education to all by harnessing the disruptive potential of AI.
- Analysis of Curriculum, construction of blue print, selecting appropriate teaching strategies according to needs of students and conducting action research to solve classroom problems.

Reference book: Mindset (Carol S. Dweck, 2017): A liberating way to approach life, as per which everything great is work in progress. A must-read and the book I have gifted most often. Read here for more: Winning (Jack Welch, 2005): Probably the best book on leadership out there. Great advice which I keep on referring to regularly. Often while facing a difficult situation at work I am reminded of some of the learnings: "Don't run for office. You are already elected.", or how Candor is the biggest dirty little secret in education.

Good to Great (Jim Collins, 2001): One of the most popular business books. Concepts introduced in this book like Level 5 leadership, Stockdale's paradox, Flywheel & Hedgehodge concept have become almost legendary.

Shoe Dog (Phil Knight, 2016): An adrenalin-pumping story of how Nike was built. If you are not into non-fiction and would like to start somewhere, this could be the perfect start!

Hit Refresh (Satya Nadella, 2017): A great read on leadership, empathy, and how to drive change. Learn how to transform an organization and a bit about partnerships and technology.


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**PRIST DEEMED TO BE UNIVERSITY
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VALUE ADDED COURSE**

Course code: 22130VAC3 – Health and Well-Being

Objectives:

- To introduce the learners to the concept of health and wellness and its solely
- To introduce the learners to the concept to health and wellness and its relevance in daily life.
- To introduce the learners to the relation between mind-body and its relevance.
- To introduce learners to health behavior and promotion of human strengths for well-being evince daily life.
- To introduce the learners to the relation between mind-body and its relevance.

UNIT-I: INTRODUCTION TO HEALTH & WELLNESS

Definition of health-WHO definition-Importance of health in everyday life-Components of health-physical, social,mental,spiritual and its relevance Concept of wellness-Mental Health & wellness-Determinants of health behaviors-Using the mass media for health promotion

UNIT-II: Mind-Body connection in health-concept and relation-Implications of mind-ode connections. Well being-Digital wellbeing-Understanding health beliefs, and perspectives of in digamous people pertaining to Assam and North Estonia Promoting Human strengths and life enhancement Classification of human strengths and virtues; cultivating inner strengths: Hope and optimism

UNIT-III: Science of Wellbeing is an evolving science with contributions from multiple disciplines including Psychology , Sociology , Health & Physical Education , Nutrition , Environmental Science and Finance. With the distinct knowledge base of social and behavioral science at its core , it began as a branch of social science and has since evolved. The term Wellbeing encompasses Holistic Health and Happiness, in addition to positive functioning of physical , emotional and social domains.

UNIT-IV: In modern world, " Wellbeing " is referred as stress free living and happiness in terms of positive psychological interventions, good physical functioning in terms of health, nutrition and physical education as well as financial security in terms of commercial studies.

UNIT-V: The subject being offered at the Higher Secondary level under the West Bengal Council of Higher Secondary Education provides the scope for the students to choose higher education and vocation at degree course involving Psychology , Physical Education , Sociology and Nutrition for career opportunities as Psychologist , Motivational speaker , Wellbeing Counselor , Physical educator and Yoga Therapist , Nutritionist and Diet Therapist etc.

LEARNEROUTCOMES:

- After completion of this course the learner will be able to:
- Explain the concept and nature of health, wellness and it various implications
- Dementia trade quite knowledge on well-being and promotion of healthy behavior..

REFERENCE BOOK

1. Carr, A. (2004). *Positive Psychology:Thescience of happiness and humanstrength*. UK: Routledge.
2. Forshaw,M.(2003). *Advancedpsychology: Healthpsychology*. London: Hodderand Stoughton.
3. Hick, J.W. (2005). *Fifty signs of Mental Health. A Guide to understanding mental health*. Yale University Press.
4. Snyder,C.R. & Lopez,S.J.(2007). *Positivepsychology: Thescientificandpractical explorations of human strengths*. Thousand Oaks, CA: Sage.


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**PRIST DEEMED TO BE UNIVERSITY
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VALUE ADDED COURSE**

Course code: 22130VAC4 – Modern Pedagogical Techniques

Objectives:

- Explain the concept of group analysis, Brain storming, Micro teaching ,different types of techniques, programmed, inquired, co-operative learning and mind mapping with illustration
- Describe the innovative medias involved in teaching and learning process such as M- Learning and E-Learning in the class room
- Familiar with online Learning Tools which are used to connect the learners to teach them.

UNIT – 1 – Innovative Techniques

Group analysis: Meaning - Methods – Brain Storming: Meaning - Methods - Micro Teaching Technique: Meaning - Characteristics - Procedure - Phases -Principles - Teaching Skills -Set induction - Reinforcement - Probing Questions - Stimulus Variation - Closure - Black Board Skills - Advantages - Disadvantages.

UNIT – 2 – Individualised Instructions

Programmed Learning - Concept - Characteristics - Principles - Styles of Program -InquiryBasedLearning - Concept - Characteristics - Misconception - Criticism - Mind Map - Concept - Characteristics - Examples.

UNIT – 3 – Educational Approaches

Cooperative Learning - Meaning -Techniques - Benefits - Dramatization - Meaning - Importance - Types - Advantages - Limitations -Gamification - Meaning - Techniques - Design – Applications.

UNIT – 4 – Audio-Visual Aids

Need for Audio Visual Aids - Role of Audio Visual Aids - Purpose - Print Resources - Newspaper - Magazines - Journal - Encyclopaedia - Audio Resources – DVDs - CD - Visual Resources - Pictures - Flash card - Charts- Posters – Photographs- Models - ICT Resources - Television – Internet- Multimedias.

UNIT – 5 – Interactive Electronic Whiteboard

Highlights - Features - General operation and use - Classroom uses - Benefits - Criticisms

Outcomes:

practice the group analysis, Brain storming and Micro teaching and understanding the application of mind mapping and obtaining knowledge in programmed, cooperative and inquiry based learning

Apply of the innovative medias involved in teaching and learning process such as M- Learning and E-Learning can be practiced in the class room

Reference book:

- Denning,P.J and Tedre,M. (2019) Computational Thinking, The MIT Press.
- Flatley, Joseph .L (2011) Augumented reality at the Allard Pearson Museum in Netherland.
- Higgins,s.,Xiao,Z, (2012) The impact of Digital Technology on learning: A summary for the Education Endowment Foundation, London.
- Rajasekar,S. and Raja Ganesan,D.(2013) Methods of Teaching of ComputerScience,Hyderebad: Neeikamal Publications PVT Ltd.


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PRIST DEEMED TO BE UNIVERSITY
DEPARTMENT OF EDUCATION
B.Ed. SYLLABUS, 1st YEAR SEMESTER - I
ENHANCING PROFESSIONAL CAPABILITIES /
ELECTIVE - GUIDANCE AND COUNSELLING
COURSE CODE: 22130EP14B

COURSE OBJECTIVES:

The student teacher will be able to:

- CO1: list out the principles underlying guidance
- CO2: elucidate the need of guidance and counselling in schools
- CO3: describe the different services in the school guidance programme
- CO4: understand the various therapies in counselling
- CO5: acquire the skills necessary to administer and interpret standardized tools

UNIT I: GUIDANCE

Guidance- Meaning, Definitions, Aims, Nature, Principles and Needs. Types- Educational, Vocational, Personal, Social- History of guidance movement in India- Problems of guidance movement- ways to improve guidance services in India - Benefits- Limitations. **Guidance Movement in India.** Therapies in Counselling: Psycho- behavioral therapy, Psycho - analytic therapy, Gestalt therapy – Stress and stress management, History of guidance movement in India – Problems of guidance movement in India – Ways to improve guidance movement in India.

UNIT II: COUNSELLING

Counselling- Meaning, Definitions, Elements-Characteristics – Objectives – Need – Types: Directive Counselling, Non-Directive Counselling, Eclectic Counselling – Meaning, Characteristics, Steps, Advantages, Limitations – Difference between Counselling and Guidance. **Qualities of a Counsellor** Counsellor – Qualities – Functions- Professional Ethics- Role of Teacher as counselor

UNIT III: GROUP GUIDANCE AND GROUP COUNSELLING

Group guidance – Meaning, Definition, Objectives, Problems, Significance – Techniques, Uses. Group counselling – Meaning, Requirements - Uses. **Theories of Vocational Choice** – Ginzberg, Super, Holland, Havighurst, Structural theory.

UNIT IV: TESTING DEVICES IN GUIDANCE

Testing devices in guidance: Meaning, Definition, Measurement, Uses of psychological tests: Intelligence tests – Aptitude tests- Personality Inventories- Attitude scales – Achievement tests – Creativity tests -Mental health – frustration conflict. **Non –Testing Devices in Guidance** Non-testing devices in guidance: Observation – Cumulative record, Anecdotal record, Case study , Autobiography, Rating Scale, Sociometry etc.

UNIT V: GUIDANCE SERVICES IN SCHOOLS

Guidance services at different school levels-Meaning, Significance, Types – Organisation of Guidance services in schools – Role of guidance personnel – Career and Occupational Information – sources, gathering, filing, dissemination- Career Corner- Career Conference- Career exhibitions. Good practices in Tamilnadu - Mobile Counselling centres - State Resource center for counselling children with disability. **Guidance for Exceptional Children** – Meaning, and Types. Guidance for gifted, backward, mentally retarded, orthopedically handicapped, visually impaired, deaf and dumb, juvenile delinquents-guidance for dropouts- Socially disadvantaged children - Alcoholics, Addicts - Sexual harassment-Eve teasing- Gender discrimination - Exemptions in examination for exceptional children.

SESSIONAL ACTIVITIES:

- Observe and inquire the process of learning by children from different backgrounds and record your observations.
- Visit any two Special Education Institutions and write a report on the methods of teaching.


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B.Ed. SYLLABUS – 1st YEAR SEMESTER – I
ENHANCING PROFESSIONAL CAPABILITIES /ELECTIVE
EDUCATIONAL ADMINISTRATION AND MANAGEMENT
COURSE CODE: 22130EP14C

COURSE OBJECTIVES:

The student teacher will be able to:

CO1: acquire knowledge of the terms used in educational administration and management

CO2: understand the role of head master and his/her duties

CO3: develop the mode of inspection and supervision of function

CO4: know the role of teacher in decision making

CO5: develop interest in the educational administration and management techniques

UNIT I - EDUCATIONAL ORGANIZATION

Principles or criteria -Organizational structures - Administrative structures at Central and State levels.

UNIT II- ESSENTIAL FACETS OF ADMINISTRATION

Headmaster and Teacher's duties and responsibilities, Role of the Head master – Parent Teacher Association-Time-Table- Co-curricular activities - Discipline- Student evaluation.

UNIT III - INSPECTION AND SUPERVISION

Aims, Meaning, Modern concepts - Types of Inspection and Supervision - Functions and duties of inspector and supervisor.

UNIT IV- DECISION MAKING IN ADMINISTRATION

Meaning - Importance - Process - Decision making techniques - Teachers' role in decision making- Involvement of pupils in decision making.

UNIT V - MANAGEMENT

Meaning-Definition -Objectives of Management -Role of Management -Difference between Administration and Management- Functions of Management –PODSCORB (Planning, Organization, Direction, Staffing ,Co-ordination, Reporting, Budgeting) - Modern Functions: Planning ,Organizing ,Leading ,Controlling-Management skills: Conceptual skills, Human skills, Technical skills.

SESSIONAL ACTIVITIES:

- A study of any one N.G.O (Non Government Organization) promoting education. (Study includes the objectives, functions, problems & contribution to education.)
- Yogic Practices for healthy living - some select yogic practices:Asanas, Bandha, Kriyas and Pranayama - Supine position, prone position, sitting position, standing position.
- Write and display of Education related quotes in your institution.
- Prepare an album about the best practices of various schools.
- Organize an Essay Writing Competition for protecting and safeguarding our Eco – System and submit a write up on it.
- Prepare a detailed report on the code of conduct observed by the teachers in schools

REFERENCES:

- Chakraborty, A. K. (2004). Principle & practice of education. Meerut: R.Lall Books Depot NIEP A.
- Chaupe, S. P . (2008). Foundations of education. UP: Vikas Publishing House Pvt Ltd
- Chaupe, S. P ., & Chaupe, A. (2008). School organisation. New Delhi: Vikas Publishing House.
- Gangadhar, R. M., & Rao, V . P . S. (2000). Organizational behaviour . Delhi: Konark Publishers Pvt. Ltd.

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B.Ed. SYLLABUS – 1st YEAR SEMESTER – I
ENHANCING PROFESSIONAL CAPABILITIES /ELECTIVE
PRE –PRIMARY EDUCATION
COURSE CODE: 22130EP14D

COURSE OBJECTIVES:

The student teacher will be able to:

CO1: gain the knowledge of the development of Pre-Primary education

CO2: acquaint with the policy perspectives of ECCE in India and world

CO3: systematize experiences and strengthen the professional competencies of pre-school Teachers.

CO4: organize meaningful learning experiences for pre-school children

CO5: develop skills required in selecting and organizing learning experiences

UNIT I: HISTORICAL APPROACH

Contribution of great educators to the development of child education: Comenius, Rouseau Pestalozzi, Froebel, Montessori, Dewey, Tagore and Gandhiji Development of Pre – Primary and Primary Education in India – Brief survey of Ancient India : Moghal, British period and Independent India Implications for Pre – Primary and Primary Education in our country – Reports of different Education commissions – Particularly the secondary education commission, the Kothari commission of 1964-66 and the new policy of education, 1986 – Development of Pre – Primary and Primary Education under the five year plans – the place of Pre- School and Primary education in the 10+2+3 pattern of education.

UNIT II: ECCE: POLICY AND PERSPECTIVES

Concept, significance and objectives of ECCE. ECCE in India: Policies and programs in national policy on Education (NPE, 1986) and POA (1992), National plan of action for children, 1992 and 2005 National curriculum framework (2005). ECCE in Global perspectives: United Nations convention on Rights of the child (UNCRC, 1989), Millenium Development Goals (2000) and Global monitoring report (UNESCO) 2007 – concerns and issues.

UNIT III: THE DEVELOPMENT OF CHILDREN

Aspects of Child Development: Physical including sensory motor development, intellectual including concept formation, language development, emotional and social - Development tasks up to late childhood: growth norms and their implications for education. Needs of normal and exceptional children biological, psychological, socio- cultural, health and nutritional needs - Needs as motives for child learning.


UNIT IV: PRE-PRIMARY EDUCATION

Principles involved in planning the programme of activities with reference to the aims and objectives of this stage - Basic schedule of activities - Planning and implementation, factors influencing planning - Importance of personal hygiene and environmental sanitation in the programme - Technique of developmental activities: Play , storytelling, language games, number work, creative work and activities for self-expression, group and individuals activities. Role of ICDS - Functions of Anganwadi.

UNIT V: STRATEGIES / APPROACHES AND RESOURCES

Characteristics of programmes for different settings – Pre-primary schoolers and early primary grade children – needed emphasis and rationale. General principles to curricular approaches – activity based play-way , child- centred, theme-based, holistic, joyful, inclusive – meaning, rationale and practical implications in specific contexts; puppetry , musical and rhythmic exercises, dramatization, art activities indoor and outdoor play , field trips and explorations as methods in primary and early primary stages - meaning, rationale, selection criteria, method of transaction Local specific community resources – human and material & their integration in curricular activities; preparation & use of learning and play materials - principles and characteristics; community involvement in effective implementation of ECCE programme Informal evaluation through observation & remediation training of ECCE workers. Exhibitions, parent' day programmes etc.

SESSIONAL ACTIVITIES:


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PRIST DEEMED TO BE UNIVERSITY
DEPARTMENT OF EDUCATION
B.Ed. SYLLABUS, 1st YEAR SEMESTER -II
ENHANCING PROFESSIONAL CAPABILITIES / ELECTIVE
EXPLORING LIBRARY AND OTHER LEARNING RESOURCES
COURSE CODE: 22130EP24B

COURSE OBJECTIVES:

The student- teachers will be able to:

CO1: Define library and acquire knowledge on information sources and services.

CO2: Develop understanding about user education.

CO3: Understand the place of MOOCs in the changing scenario.

CO4: develop an understanding about organizing different types of library

CO5: acquire knowledge about various instructional strategies to teach the students

UNIT I – EXPLORING LIBRARY AND INFORMATION SOCIETY

Library – Meaning – Definition – Types of Library; functions and objectives – laws of library science and implications in teacher education libraries. Information Science as a discipline and its relationship with other subject field.

UNIT II – INFORMATION SOURCES

Information: definition – sources of information – types of references – sources. Documentary Sources: Primary, Secondary and Tertiary – Non Documentary Sources: Electronic/Web learning – Sources – e book – e journal, e – learning – subject gateways in teacher education.

UNIT III – INFORMATION SERVICES

Reference Services – Types of reference services Current Awareness Services, Selective Dissemination of information, Translation service, Reprographic Services, Bibliographic Service, Indexing and Abstracting Services – on line services – learning resource centre.

UNIT IV – LIBRARY NETWORK

Library Automation – Digital Library, Electronic Library, Virtual Library, Library Networks: ERNET, DELNET, INFLIBNET – Documentation centres – NASSDOC, INSDOC – on line search of teacher education database – MOOCS.

UNIT V – USER EDUCATION

User Education in academic libraries – Role of teachers in the use of library. Library Committee: constitution and its functions. Library resources for classroom translations – encouraging reading and referring habit.

SESSIONAL ACTIVITIES:

- Study the Social Customs prevailing in the local community and submit a report.
- Study the religious diversities existing in the community and describe the root causes for such diversities.
- Education and vertical/ Horizontal Social Mobility – Conduct a Survey in a village/ward and prepare a report.
- Study the Social Stratification in a Village/ ward and prepare a report on it.
- Study the Essential skills & Life skills in education and prepare a report on it.

REFERENCES:

- Kusum, Veerna (2005) Digital Library: Preservation Strategies: New Delhi: Akansha Publishing House.
- Krishna Kumar (2004) Reference Services. New Delhi – Sterling Publishers.
- Navalani K. & Satija, MPC (1996). Library and Information Services: Emerging Challenges. Jaipur: RBSA Publishers.

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DEPARTMENT OF EDUCATION
B.Ed. SYLLABUS, 1st YEAR SEMESTER -II
ENHANCING PROFESSIONAL CAPABILITIES /ELECTIVE
TEACHING OF EARLY CHILDHOOD EDUCATION
COURSE CODE: 22130EP24C

COURSE OBJECTIVES:

The student teacher will be able to

- CO1: develop awareness about the importance of Early Childhood Education.
- CO2: acquire a sound knowledge about the contributions of various philosophers to the cause of early childhood education.
- CO3: develop an understanding about organizing different types of early childhood education programmes.
- CO4: acquire knowledge about various instructional strategies to teach young children.
- CO5: develop awareness about the various developmental aspects of children.

UNIT I: HISTORY OF EARLY CHILDHOOD EDUCATION IN INDIA:

Concept of Early Childhood Education - Need and importance of Early childhood Education - Objectives - Early Childhood Education movement in India and Abroad - Problems of Early Childhood Education in India.

UNIT II: CONTRIBUTIONS OF PHILOSOPHERS TO PRE SCHOOL EDUCATION :

Contributions of Froebel- Rousseau-Montessori- Piaget- Comenius- Gandhiji-Tagore and Dhara Bai Modak.

UNIT III: PLANNING AND ORGANIZATION OF PRE SCHOOLS:

Planning of pre-school programmes - Yearly plan, Monthly plan, Weekly plan, Daily plan -Organisation of a pre-school - site, space, material, personal and time- Types of pre-school programmes - Nursery , Kindergarten, Montessori, pre-basic and Balwadi - Role of ICDS (Integrated Child Development Scheme).

UNIT IV: GROWTH AND DEVELOPMENT OF CHILD:

Developmental stages - parental period - factors affecting parental period- Birth hazards, immunization schedule - various aspects of development with special emphasis to early childhood period.

UNIT V: SPECIAL NEEDS AND PROBLEMS OF PRE-SCHOOL CHILDREN:

Needs of pre-school children - children with special needs - physical, visual and hearing impairment - Learning disabilities - Behaviour problems - Aggression, temper tantrum, stealing, lying, eating problems, nail biting, bed wetting, thump sucking - their causes and remedial measures.

SESSIONAL ACTIVITIES:

- Observe and inquire the process of learning by children from different backgrounds and record your observations.
- Prepare an album of any 10 psychologists and their contributions to the learning process.
- Visit any two Special Education Institutions and write a report on the methods of teaching.

REFERENCES:

- Hurlock, Elizabeth, B. (2001). Child growth and development, Tata McGraw Hill publishing company, New Delhi.
- Kaul Vinetha (2001). Early Childhood Education Programme. National council of Educational Research and Training, New Delhi.
- Mohanthy jaganmuth and Bhagyadhar Mohanthy (2000). Early Childhood care and Education, Deep and Deep Publication, New Delhi.
- Ruth Katherine et.al. (1987). Early Childhood programmes. New York


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B.Ed. SYLLABUS, 1st YEAR - SEMESTER –II
ENHANCING PROFESSIONAL CAPABILITIES /ELECTIVE
PROFESSIONAL COURSE FOR TEACHER PROFICIENCY
COURSE CODE: 22130EP24D

COURSE OBJECTIVES:

The student teachers will be able to

CO1: Acquire knowledge on various concepts of Pedagogy.

CO2: Extrapolate on various stages of developmental tasks.

CO3: Enumerate various aspects of guidance and counseling.

CO4: Apprise on cognitive development.

CO5: Acquire mastery in the professional course for teachers' proficiency.

UNIT I – CHILD DEVELOPMENT AND PEDAGOGY

Nature of Educational Psychology – Human Growth and Development – Cognitive Development – Social, Emotional and Moral Development – Learning – Intelligence and Creativity – Motivation and Group Dynamics – Personality and Assessment – Mental Health and Hygiene – Guidance and Counseling.

UNIT II – TEXT BOOK ANALYSIS

Syllabus prescribed for Standard VI, VII and VIII by Government of Tamil Nadu (From time to time) (Tamil, English and Subject)

UNIT III – TEACHING PROFICIENCY

Definition for Proficiency – The role of teacher in the class-room management - Tactics for effective Instructional communication - Criteria for the selection of Tools and Techniques for teaching and Learning.

UNIT IV - PROFESSIONAL ETHICS FOR TEACHER

Code of conduct of Teacher – Ethics and Etiquettes – Unethical activities – qualities of professional towards student development and curriculum – Right of Children to free and compulsory Education – concept of Disciplinary proceedings and Punishment.

UNIT V – LEADERSHIP PROFILE

School vision – Instructional Leader – Organizational Leader – Community Leader – communication skill commitment – Decision Making and Problem Solving- Transformational Leader.

SESSIONAL ACTIVITIES:

- Prepare a question paper for classes IX to X and XI to XII to asses all the aspects of language learning.
- Analyse the text books of English of Tamil Nadu Govt. in terms of organization and integration of essential components, skills, needs and requirements with special reference to learners.


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B.ED. SYLLABUS SECOND YEAR SEMESTER – III
ENHANCING PROFESSIONAL CAPABILITIES / ELECTIVE
STRENGTHENING LANGUAGE PROFICIENCY
COURSE CODE: 22130EP33C

COURSE OBJECTIVES:

The students will be able to

CO1: Develop comprehending ideas, for reflection and thinking, as well as for expression and communication.

CO2: Enhance one's facility in the language of instruction is thus a vital need of student-teachers, irrespective of the subject areas that they are going to teach.

CO3: visualize as a range of primarily text-based language activities, which will aid in strengthening the ability to 'read', 'think', 'discuss and communicate' as well as to 'write' in the language of instruction.

CO4: Develop a taste for and abilities in reading and making meaning of different kinds of texts.

CO5: Use language for effective communication. Familiarize with nature and structure of English language

UNIT I: ENGAGING WITH NARRATIVE AND DESCRIPTIVE ACCOUNTS

The selected texts could include stories or chapters from fiction, dramatic incidents, vivid descriptive accounts, or even well-produced comic strip stories.

UNIT II: ENGAGING WITH POPULAR SUBJECT BASED EXPOSITORY WRITING

The selected texts could include articles, biographical writing, or extracts from popular non-fiction writing, with themes that are drawn from the subject areas of the student teachers (various sciences, mathematics, history, geography, literature/language pieces)

UNIT III: ENGAGING WITH JOURNALISTIC WRITING

The selected texts would include newspaper or magazine articles on topics of contemporary interest.

UNIT IV: ENGAGING WITH SUBJECT-RELATED REFERENCE BOOKS

For this Unit, the student-teachers should work in groups divided according to their subjects. Within these groups, pairs of student-teachers would make a choice of a specific topic in their subject area which they could research from a set of available reference books. The focus of this Unit is, as much the learning of effective processes of reference research and its presentation, as the actual reading of the reference books themselves.

UNIT V: ENGAGING WITH EDUCATIONAL WRITING

Selected texts could be drawn from the wide range of popular educational writing in the form of well-written essays, extracts or chapters from authors who deal with themes from education, schooling, teaching or learning. The writings selected should present a definite point of view or argument about some aspects of the above themes.

SESSIONAL ACTIVITIES:

- Write an essay on various contemporary social and educational emerging issues and problems in detail
- Enumerate the activities from the school text book
- Suggest your own activities using supplementary materials
- Analyse the tasks given at the end of any one unit in the text book

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B.Ed. SYLLABUS SECOND YEAR SEMESTER – III
ENHANCING PROFESSIONAL CAPABILITIES / ELECTIVE
GENDER ISSUES IN EDUCATION
COURSE CODE: 22130EP33D

COURSE OBJECTIVES:

The student teacher will be able to:

CO1: develop basic understanding and familiarity with key concepts—gender, gender-bias, gender stereotype, empowerment, gender parity, equity and equality, patriarchy and feminism;

CO2: understand the gradual paradigm shift from women's studies to gender studies and some important landmarks in connection with gender and education in the historical and contemporary period;

CO3: learn about gender issues in school, curriculum, textual materials across disciplines, pedagogical processes and its intersection with class, caste, religion and region; and

CO4: understand how gender, power and sexuality relate to education (in terms of access, curriculum and pedagogy).

CO5: understand how the female, power and sexuality relate to education.

UNIT I: GENDER ISSUES: KEY CONCEPTS

Gender, sex, sexuality, patriarchy, masculinity and feminism - Gender bias, gender stereotyping, and empowerment - Equity and equality in relation with caste, class, religion, ethnicity, disability and region.

UNIT II: GENDER STUDIES: PARADIGM SHIFTS

Paradigm shift from women's studies to gender studies - Historical backdrop: Some landmarks from social reform movements of the nineteenth and twentieth century's with focus on women's experiences of education - Contemporary period: Recommendations of policy initiatives commissions and committees, schemes, programmed and plans.

UNIT III: GENDER, POWER AND EDUCATION

Theories on Gender and Education: Application in the Indian Context - Gender Identities and Socialization - Schooling of Girls: Inequalities and resistances (issues of access, retention and exclusion).

UNIT IV: GENDER ISSUES IN CURRICULUM

Gender, culture and institution: Intersection of class, caste, religion and region - Curriculum and the gender question - Construction of gender in curriculum framework since Independence: An analysis - Gender and the hidden curriculum - Gender in text and context (textbooks' inter-sectionalist with other disciplines, classroom processes, including pedagogy) - Teacher as an agent of change - Life skills and sexuality.

UNIT V: GENDER, SEXUALITY, SEXUAL HARASSMENT AND ABUSE

Linkages and differences between reproductive rights and sexual rights - Development of sexuality, including primary influences in the lives of children (such as gender, body image, role models) - Sites of conflict: Social and emotional - Understanding the importance of addressing sexual harassment in family, neighbourhood and other formal and informal institutions - Agencies perpetuating violence: Family, school, work place and media (print and electronic) - Institutions redressing sexual harassment and abuse.

SESSIONAL ACTIVITIES:


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B.Ed. SYLLABUS – SECOND YEAR SEMESTER – IV
ENHANCING PROFESSIONAL CAPABILITIES / ELECTIVE
UNDERSTANDING THE SELF
COURSE CODE: 22130EP45B

COURSE OBJECTIVES:

The Student – Teachers will be able to:

CO1: Enable students to develop a vision of life for themselves.

CO2: Encourage students to give conscious direction to their lives to take responsibility for their actions.

CO3: Develop a holistic and integrated understanding of the human self and personality.

CO4: Facilitate the personal growth of the students by helping them to identify their own potential.

CO5: Develop the power of positive attitude.

UNIT – I EXPLORING THE AIM OF LIFE WORKSHOP THEMES:

Vision as a person - aspiration and purpose of life – Giving a conscious direction to life – Understanding difference dimensions of self and personality and way in which they influence the dynamics of identity formations, values and direction of life.

UNIT – II DISCOVERING ONE’S TRUE POTENTIAL:


Understanding one’s strengths and weaknesses through self observation exercises – Taking responsibility for one’s own actions – Developing positivity, self esteem and emotional integration – Exploring fear and trust competition and cooperation – Developing skills of inner self organization and self reflection – Writing a self-reflective journal

UNIT – III DEVELOPING SENSITIVITY:

Understand and challenge the unconscious, conditional attitudes that are stereotyped and prejudiced gender, caste, class, race region, disability etc and critically examine the sources of stereo typed messages (eg. media) – Defining consciously one’s own values towards self and society and develop a capacity to understand and appreciate divergent points of view – Widening their realm of consciousness – Developing the capacity for empathic listening and communications skills – Understanding one’s own childhood and adult – child gaps in society.

UNIT – IV PEACE, PROGRESS AND HARMONY:

Establishing peace with in oneself - exercises of concentration and meditation – Understanding group dynamics and communication – Creating group harmony – Exploring methods of creating a collective aspiration for progress and conflict resolution – Exploring the bases of social disharmony: becoming the agents and catalysts of change and exploring methods of facilitating change.


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B.Ed. SYLLABUS - SECOND YEAR SEMESTER - IV
ENHANCING PROFESSIONAL CAPABILITIES / ELECTIVE
ADDRESSING SPECIAL NEEDS IN THE CLASSROOM
COURSE CODE: 22130EP45D

OBJECTIVES:

The student- teachers will be able to:

- CO1: demonstrate knowledge of different perspectives in the area of education of children with disabilities;
- CO2: reformulate attitudes towards children with special needs;
- CO3: identify needs of children with diversities;
- CO4: plan need-based programmed for all children with varied abilities in the classroom;
- CO5: use human and material resources in the classroom;

UNIT I: PARADIGMS IN EDUCATION OF CHILDREN WITH SPECIAL NEEDS

Historical perspectives and contemporary trends - Approaches of viewing disabilities: The charity model, the bio centric model, the functional model and the human rights model - Concept of special education, integrated education and inclusive education; Philosophy of inclusive education.

UNIT II: LEGAL AND POLICY PERSPECTIVES

Important International Declarations/Conventions/Proclamations – Biwako Millennium Framework (BMF, 1993-2012); Recommendations of the Salamanca Statement and Framework of Action, 1994; Educational Provisions in the UN Convention on the Rights of Persons with Disabilities (UNCRPD), 2006; Constitutional Provisions; Programmed and Schemes of Education of Children with Disabilities;

UNIT III: DEFINING SPECIAL NEEDS

Understanding diversities-concepts, characteristics, classification of children with diversities (Visual Impairment, Hearing Impairment, Specific Learning Difficulties, Locomotors and Neuromuscular Disorders, Mental Retardation, Autism, Leprosy Cured Persons, Mental Illness and Multiple Disabilities) - Special needs in terms of the curriculum in the context of different disabilities and their learning styles - Concept of an inclusive school – infrastructure and accessibility, human resources, attitudes to disability, whole school approach.

UNIT IV: INCLUSIVE PRACTICES IN CLASSROOMS FOR ALL

School's readiness for addressing learning difficulties - Assessment of children to know their profile - Technological advancement and its application – ICT, adaptive and assistive devices, equipments and other technologies for different disabilities - Classroom management and organization - Responding to special needs by developing strategies for differentiating content, curricular adaptations, lesson planning and TLM

UNIT V: DEVELOPING SUPPORT NETWORKS

Addressing social climate of the classroom - Child-to-child programmed - Developing partnerships in teaching: Teacher and special teacher; Teacher and co-teaching personnel; Parents as partners - developing positive relationships between school and home - Involving community resources as source of support to teachers- Involving external agencies for networking – setting up appropriate forms of communication with professionals and para professionals.

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M.Ed. SYLLABUS-SEMESTER-I
SPECIALIZATION CORE COURSE-I
EARLY CHILD CARE AND EDUCATION
COURSE CODE: 22230SC15A**

COURSE OBJECTIVES:

1. Know the historical development of early childhood care and education.
2. Understand the different aspects of child development.
3. Review the various committees and commissions suggestions on early childhood education.
4. Execute the principles of planning and management of early childhood care and education.
5. Explain the various organizations contributions in early childhood care and education.

UNIT-I: OVERVIEW OF EARLY CHILDHOOD EDUCATION

Early Childhood Education: Concept, meaning, nature, objectives, need and importance – Early Childhood Education Movement in India and Abroad – Prominent promoters of Early Childhood Care and Education: Plato, Rousseau, Montessori, Froebel, Piaget, Tagore, Gandhi, Aurobindo, Giju Bhai Patil and Tarabai Modak.

UNIT-II: DEVELOPMENT DURING EARLY CHILDHOOD PERIOD

Pattern and Factors influencing the Physical development, Motor development, Emotional development, Social development, Cognitive development and Language development of the Pre-school children – Concept development: Importance and learning of various concepts such as size, shape, colour, weight, time and number.

UNIT – III: COMMITTEES AND COMMISSIONS ON EARLY CHILDHOOD CARE AND EDUCATION

Sargent Report (1944), Secondary Education Commission (1952-53), Child Care Committee (1963-64), Indira Education Commission (1964-66), Report of the Study Group (1972), National Policy on Education (1986), Millennium Development Goals (2000), National Focus Group on ECCE (2006) and Education for All Global Monitoring Report (2007) – International Treaties on Agreement relating to ECCE: Declaration of Human Rights (1948), Declaration of the Rights of the Child (1959), Convention on the Rights of the Child (1989), Salamanca Statement (1994) and Dakar Framework for Action of Education for All (2000).

UNIT – IV: PLANNING AND MANAGEMENT OF EARLY CHILDHOOD CARE AND EDUCATION

Principles involved in planning Pre-school programmes – Short-term and Long-term planning – Importance of Rhymes, Songs, Stories, Science exhibitions, Field trips, Puppet shows and Dramatization – Habit formation: Eating, Sleeping, Dressing and Toilet training- Requirements for Starting Early Childhood Care and Education: Finance, Place, Building, Staff and Records – Crèches: Aims, objectives, importance, and types.

UNIT – V: ORGANISATIONS INVOLVEMENT IN HEALTH CARE OF EARLY CHILDHOOD STAGE

Organizations working for pre-school education: NIPCCD (National Institute for Co-operative Child Development), NCERT, ICDS, UNICEF and CARE (Co-operative Assistance and Relief Everywhere) – Nutrition and Health of an Early Childhood Stage – Common Communicable Diseases of Early Childhood Stage.

SUGGESTED ACTIVITIES:

1. Make a resource file on collection of pictures, available materials and articles related early Childhood Education.
2. Visit to ICDS center and observing the ICDS Programme.

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M.Ed. SYLLABUS-SEMESTER-I
SPECIALIZATION CORE COURSE-III
INCLUSIVE EDUCATION
COURSE CODE: 22230SC15C

COURSE OBJECTIVES:

1. Enable students to understand the historical perspectives on education of children with diverse needs
2. Develop critical understanding of the recommendations of various commissions and committees towards inclusive education.
3. Understand the nature of difficulties encountered by children and prepare conducive teaching learning environment in inclusive schools,
4. Analyze special education, integrated education, mainstream and inclusive education practices, identify and utilize existing resources for promoting inclusive practice.
5. To develop awareness of learner towards inclusive education and its practices.

UNIT-I: INTRODUCTION TO INCLUSIVE EDUCATION

Definition- concept and importance of inclusive education - Historical perspectives on education of children with diverse needs - Difference between special education, integrated education and inclusive education - Advantages of inclusive education for education for all children.

UNIT-II: CONCEPT AND NATURE

Concept and principles of Inclusion - Benefits of Inclusion - Need of Inclusive education - Policies and legislations for Inclusive Education and Rehabilitation - National legislation's for Inclusive Education - Government Scheme and Provisions.

UNIT-III: COMPETENCIES DEVELOPMENT FOR INCLUSIVE EDUCATION

Theories of Inclusive Education - Philosophical Approaches to Inclusive Education - Attitude and positive behavior for Inclusion - Developing attitude and Competencies for Inclusion - Attitude, Self- Efficacy, Skill and Ideologies - Social skills for Inclusion.

UNIT-IV: RECOMMENDATIONS OF EDUCATION COMMISSIONS AND COMMITTEES INTERNATIONAL INITIATIVES

The Convention on the Rights of the Child - the World Declaration on Education - World Declaration on the Survival, Protection and Development of Children - Plans of action - Asian and Pacific decade of Disabled Persons - World Conference on Special needs Education and the Salamanca Statement and framework for action on Special Needs Education - National Initiatives - Indian Education Commission - integrated Education for Disabled Children - National Policy on Education - Establishment of National Institutes and their Regional Centers - Project Integrated Education for disabled children - District Primary Education Programme - Persons with Disabilities Act - Sarva Shiksha Abhiyan - Mental Health Act, - Rehabilitation Council of India Act, Persons with Disabilities Act, Protection of rights and full participation, National Trust for the Welfare of Persons with Autism.

UNIT-V: PREPARATION FOR INCLUSIVE EDUCATION


Concept and meaning of diverse needs - Educational approaches and measures for meeting the diverse needs - concept of remedial education, special education, integrated education and inclusive education - Brief account of existing special, integrated and inclusive education services in India - Building inclusive learning friendly classrooms, overcoming barriers for inclusion - Creating and sustaining inclusive practices - Role of teachers, parents and community for supporting - Techniques and methods used for adaptation of content, laboratory skills and play material.

SUGGESTED ACTIVITIES:

1. Various types of educational needs of children with respect to education identified
2. Mastery lecture on Government Scheme and Provisions for Inclusive Education


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M.Ed.SYLLABUS-SEMESTER-II
SPECIALIZATIONCORECOURSE-IV
ADVANCED EDUCATIONAL TECHNOLOGY
COURSECODE:22230SC25A

COURSEOBJECTIVES:

1. Understand the meaning of Educational Technology
2. Attain knowledge about behavioural technology
3. Understand the features, working and use of the Internet and web
4. Appreciate the use of multimedia and web content for teaching learning
5. Attain knowledge about e-learning

UNIT-I:INTRODUCTIONTOICT

ICT meaning and importance- Introduction to computer - Types of Computers - Computer in Education - Characteristics of Computer - Role of ICT - Different uses of computer in education - Advantages and disadvantages of Computer - Assisted Instruction education - Introduction to a personal computer - standard computer accessories-their configurations-conceptions and functioning- Functional overview of the operating system- Standard office and media selection.

UNIT-II:BEHAVIOURALTECHNOLOGY

Technology-Meaning and nature-Microteaching-meaning and objectives-Different phases of microteaching-Merits and demerits of microteaching - Microteaching cycle-Meaning and nature- Programmed instruction-Meaning-nature and principles-Types of programmed instruction-Linear-Branching and Mathematics-Merits and demerits of programmed instruction.

UNIT-III:INTERNETANDTHEWORLDWIDEWEB

The internet and the World Wide Web-Information-services and functions of the Internet and the web-connecting to and using the web- using search engines and web utilities-keywords and search strategies-synchronous and asynchronous communication on the web-e-mail-chat-news groups and forum- Websites with educational content-Search-locate and maintain lists of educational web sites-Critically examine the content of websites-using the web as a teaching-learning resource - Academic and Research content on the web- Online journals and abstraction services.

UNIT-IV:MULTIMEDIAANDWEBCONTENT

Multimedia packages- educational implications of media use and interactivity-websites with educational content-using the web as a teaching-learning resource-online learning- Multimedia Content-Multimedia packages - installation and use-Critical analysis of multimedia content-educational implications of media use and interactivity.

UNIT-V:NEWHORIZONSOFEducationalTECHNOLOGY

Elements of e-learning,e-content and e-books-virtual classroom and virtual university-merits and limitations-Recent trends in the area of educational technology-interactive video-video-conferencing -M-learning-MOOC-Watsup etc-Recent experiments in the third world countries and pointers for India with reference to Education.

SUGGESTEDACTIVITIES:

1. Prepare a power point presentation for any two units in Educational Technology and submit it.
2. Develop a Blog of your own and add it online.
3. Visit to any IT Company to know about latest software's.
4. Analyse any one topic in different website and present your report by comparing it.
5. Explore the Usage of Office 365 and write the merits and demerits in CD.

TEXTBOOKS:

1. Kulkarni, S.S. - Introduction to Educational Technology, New Delhi - Oxford.

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M.Ed. SYLLABUS – SEMESTER – III
PERSPECTIVE COURSE V
SOCIOLOGY OF EDUCATION
COURSE CODE: 22230PC31

COURSE OBJECTIVES:

1. Enable the students to understand the basic concepts of sociology of education
2. Motivate the students to explore the relationship between social system and education
3. Make the students to analyze the role of education in cultural change
4. Enable the students to identify various agencies of education
5. Make the students to examine the role of education in promoting national integration and international understanding

UNIT-I: SOCIOLOGY AND EDUCATION

Sociology of Education: Meaning, concept and importance – Sociology and Education - Basic concepts of sociology and education. - Difference between sociology of education and Educational Sociology – Scope and functions of educational Sociology.

UNIT-II: SOCIAL SYSTEM AND EDUCATION

Social System: Meaning, Concept and Characteristics, Education as a Subsystem – Education and Social change; Social mobility, social stratification, social deviants; Constraints on social change in India (Caste, ethnicity, class, language, religion, regionalism).

UNIT- III: PROCESS OF SOCIALISATION

Agencies of socialization- Family, School, Religion, Community - Education as a social system, social process and social progress; Technological change – Industrialization, Modernization and Urbanization.

UNIT IV: EDUCATION AND DEMOCRACY

Democracy: Meaning and concept- Education and Democracy- Education for national integration and international understanding- Constitutional ideals of education- Social equity and equality of educational opportunities – Education for socially and economically disadvantaged section of the society: SC/ST/OBC/Women/ Disabled and rural population.

UNIT V: EDUCATION IN CULTURAL CONTEXT

Culture: Meaning, concept and characteristics - Education and cultural change - Cultural lag – Meaning, concept, major causes and its effect on education – Education for multi-lingual and multi-cultural Indian society.

SUGGESTED ACTIVITIES:

1. Discussion on the relationship between Sociology and Education.
2. Analyse the Constraints on social change in India.
3. Collect details on the type of educational facilities available for socially and economically disadvantaged section of the society in India
4. Discussion on social equity and equality of educational opportunities.
5. Power Point presentation on educational sociology and their educational implications.

TEXTBOOKS:

1. Agarwal J.C.(2002). *Philosophical and sociological perspectives on education*. Shipra.
2. Jayapalan, N.(2001). *Sociological theories*. Atlantic Publishers.
3. Mujibul Hasan Siddiqui (2009). *Philosophical and sociological perspectives in Education*. Neeraj.
4. Ruhela, S.P.(1970). *Sociological foundation of education in contemporary India*, Dhanpat Rai.

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M.Ed.SYLLABUS-SEMESTER-III
TOOL COURSE- EDUCATIONAL MEASUREMENT AND EVALUATION
COURSECODE:22230TC33

COURSE OBJECTIVES:

1. Comprehend the concept, meaning and nature of measurement and evaluation.
2. Understand the relationship between measurement and evaluation.
3. Acquire knowledge about various tools of measurement and evaluation in existence.
4. Develop skills on using psychological test for measurement and evaluation.
5. Get hands on SPSS to learn various statistical measurement and its analysis.
6. Enable to distinguish various competencies in standardizing different types of measuring instrument.
7. Familiarize to construct different kinds of tests and tools.
8. Obtain knowledge on statistical concepts, test scores and its transformation.
9. Assimilate the new trends in evaluation in terms of grading, semester, CCE and online test.
10. Prepare question banks and other self-study materials.

UNIT-I: CONCEPT OF MEASUREMENT AND EVALUATION

Measurement and Evaluation – Concept, Meaning, nature and need. Relationship between measurement and evaluation, Functions of measurement and evaluation.

UNIT-II: TOOLS OF MEASUREMENT AND EVALUATION

Subjective and objective tools - Tests: Essay tests, objective test, scales, questioners, schedules, inventories, observation, interviews, performance tests, oral tests-diagnostic tests and remedial measures.

UNIT-III: PSYCHOLOGICAL TESTING

Construction and Standardization of Psychological tests, Aptitude, Attitude, personality tests. Intelligence and its nature - Theories: Spearman, Thorndike, Thurston and Guilford - Types of intelligence test-their functions and uses.

UNIT-IV: STATISTICAL CONCEPTS

Test scores and their transformation: Z and T Scores, percentile- Interpretation of qualitative data. Correlation analysis, Item analysis – Basic assumption, Methods


UNIT-V: NEW TRENDS IN EVALUATION

Grading System, Semester system, Continuous Comprehensive Evaluation, Question Bank, uses of computer in evaluation.

1. .

TEXTBOOKS:

1. Adams, G.S.(1964). *Measurement and evaluation in education, psychology and guidance*. Holt, Rinehart & Winston.
2. Anastasi.(1984). *Anne psychological testing*. The MacMillan.
3. Aggarwal, Y.P.(1998). *Statistical methods*. Sterling.
4. Cooper, D.(2007). *Talk about assessment, strategy and tools to improve learning*. Thomson Nelson.
5. Earl, L.M.(2006). *Assessment as learning: Using class room assessment to maximize student learning*. Corvine Press.


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THANJAVUR - 613 403.

PRIST DEEMED TO BE UNIVERSITY
SCHOOL OF EDUCATION
M.Ed.SYLLABUS-SEMESTER-
II OIPERSPECTIVE COURSE VI EDUCATIONAL STUDIES
COURSE CODE: 22230PC41

COURSE OBJECTIVES:

1. Understand the theoretical perspectives of education as a discipline in terms of social, cultural, political, economic, technological factors, and other substantial education system and the process of knowledge construction.
2. Explore the widening of interdisciplinary knowledge in education with respect to philosophy, psychology, sociology, management, economics, anthropology, ICT, etc. and insightful construction of knowledge.
3. Incorporate the socio-cultural context of India, in line with 'unity in diversity' with reference to multilingual and multicultural, socialisation and acculturation among the community and its stakeholders, Equality in educational opportunities and education for socio-economically deprived groups and Policy of inclusion and multi-foundational approaches to learning disabilities.
4. Acquire knowledge about multiple school contexts and its personnel management system, contemporary challenges, participation of different stakeholders and re-conceptualised learning resources.
5. Acquaint with institutions, systems and structure of education along with its various regulatory and advisory bodies in education.

UNIT-I: THEORETICAL PERSPECTIVES OF EDUCATION AS A DISCIPLINE

Education as a socially contrived system influenced by social, cultural, political, economic, and technological factors - Critical analysis of concepts, principles, theories, assumptions related to education discipline, sustainable education, schooling, curriculum, syllabus, textbooks, assessment, teaching-learning process - Critical analysis of education as a discipline - Aims of Indian Education in democratic, secular, egalitarian and humane society - Bridging gap of knowledge construction between: Content knowledge and Pedagogy knowledge; School knowledge and out of the school knowledge; Experiential knowledge and empirical knowledge; Knowledge on action and reflection on outcome of action; Theoretical knowledge and practical knowledge; Universal knowledge and contextual knowledge.

UNIT-II: EDUCATION AS AN INTERDISCIPLINARY KNOWLEDGE

Interdisciplinary nature of education pertinent to philosophy, psychology, sociology, management, economics, anthropology, ICT etc. and the framework for insightful construction of knowledge - Contribution of science and technology to education and challenges ahead - Axiological issues in education: Role of peace and other values, aesthetics in education - Issues in planning, management and monitoring of schools and teacher education in behavioural management - Interrelation between education and development.


UNIT- III: SOCIO-CULTURAL CONTEXT OF EDUCATION

Social purposiveness of education - Understanding Indian society: Multilingual and multicultural, appropriate approaches for teaching of diversity - Process of socialization and acculturation of the child - critical appraisal: Role of school, parents, peer group, community and other stakeholders - Equality in educational opportunity - critical analysis in schooling, teaching-learning and curriculum for social inequality - Education of socio-economically deprived groups based on gender, local (rural/urban), income differential and different disabilities in society - Policy of inclusion and multi-foundational approaches to learning disability.

UNIT-IV: SCHOOL CONTEXT

Multiple school contexts: Rural/urban, tribal etc. - Role of personnel's in school management: Teacher, headmaster, and administrators - Nurturing learner friendly school

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PRIST DEEMED TO BE UNIVERSITY
SCHOOL OF EDUCATION
M.Ed. SYLLABUS – SEMESTER –
IV PERSPECTIVE COURSE VIII
COMPARATIVE EDUCATION
COURSE CODE: 22230PC42

COURSE OBJECTIVES:

1. Understand the need, scope and history of comparative education.
2. Comprehend the primary and secondary education's aims and methods of instruction in U.S.A, U.K, Japan, Finland and India.
3. Analyze the role of national and state government on education.
4. Explore the comparative education of primary and secondary education of U.S.A, U.K, Japan, Finland and India.
5. Realize the issues and challenges in primary and secondary education of perspective of countries: U.S.A, U.K, Japan, Finland and India.

UNIT-I: HISTORY OF COMPARATIVE EDUCATION

Comparative Education: meaning, need and scope, brief history of comparative education-Determinants of a National education system: Geographical, social, economic, political, cultural, linguistic, historical etc. approaches to comparative education, historical, sociological, philosophical and scientific approaches.

UNIT-II: PRIMARY EDUCATION AND SECONDARY EDUCATION

Primary and Secondary Education in U.S.A, U.K, Japan and India - Aims, Content, Methods of Instruction and Evaluation system. Concept of Universalization of Primary Education in India: its implications- Salient features of Education system of U.S.A, U.K, Japan and India.

UNIT-III: CONSTITUTIONAL PROVISIONS FOR COMPARATIVE EDUCATION

Basic requirements of Education in different countries- Constitutional Provisions for Comparative Education – Federal Acts on Education – Relationship between Federal, State and Local Governments – International Project for the Evaluation of Educational Achievement (IEA). Universal compulsory Education – Higher Education – Educational Finance – World Bank – UNESCO, UNICEF and IMF.

UNIT-IV: COMPARATIVE EDUCATION AT PRIMARY AND SECONDARY LEVEL

Comparative Education: Importance of Comparison- study about comparative education at primary and secondary level in U.S.A., U.K. Japan and India. Vocationalization of Secondary Education.

UNIT-V: ISSUES AND CHALLENGES IN EDUCATION

Issues and challenges in primary and secondary education from the perspective of countries: U.S.A., U.K. Japan, Finland and India. Education for disadvantaged Children, Girls' education, Child-labour, Teacher education, expenditure and quality concerns in Elementary education.

SUGGESTED ACTIVITIES:

1. Group discussion on the need, meaning and scope of comparative education.
2. Prepare scrapbook on the system of primary education and secondary education in U.K, U.S.A, Japan, Finland and India.
3. Debate the role of Federal and State government on education.
4. Explore the issues and challenges in primary and secondary education from the per-

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**PRIST DEEMED TO BE UNIVERSITY
SCHOOL OF EDUCATION
M.Ed.SYLLABUS-SEMESTER-IV
TOOL COURSE- ICT ON TEACHING AND
LEARNING COURSE CODE: 22230TC43**

COURSE OBJECTIVES:

1. Develop the professional ability in ICT
2. Understand the impact of ICT
3. Explain the various educational resources
4. Describe the various assessment techniques
5. Explain ways to create online community

UNIT-I: INFORMATION AND COMMUNICATION TECHNOLOGY (ICT)

Definition, meaning, importance and scope of ICT-

Applications of Information and Communication Technologies-

Classroom and ICT; Professional development and ICT-Emergence of new information technology-convergence of computing and telecommunications.

UNIT-II: ICT MEDIATED EDUCATION

Concept, Importance, Meaning, Objectives & Nature of ICT mediated education- Teaching-Learning Environment: Types and Modes of using ICT - Learning Environments - Features of an ICT Mediated Teaching-Learning Environment-Physical Constituents of Classroom/Environment-Social Constituents-Supporting Learners in learning

UNIT-III: ICT AND TEACHING LEARNING PROCESS

ICT and Teaching and learning Process-Need for ICT Selection-Factors affecting ICT Selection-Selection of ICT - Integration of ICT - TPACK - E-learning, Web based learning, MOOC - Educational resources.

UNIT-IV: ICT FOR EDUCATIONAL MANAGEMENT AND ASSESSMENT

Definition - e-governance - importance of ICT in manpower planning and HRD - Applications of ICT in Educational Management-Use of ICT in financial management- Creating online community of Parents, Teachers and students for Effective management- TQM and applications of ICT in TQM - Concept and meaning of Computerized Test construction and Administration -Role of ICT in Assessment - Web based Assessment - Electronic support as a tool in assessment process- Use of Blogs for assessment- Advantages and Disadvantages of ICT based assessment

UNIT-V: ARTIFICIAL INTELLIGENCE (AI) IN EDUCATION

Artificial intelligence: Meaning and history - AI integrated education - Principles and objectives of AI integrated learning- Role of schools in the success of AI integrated learning- Meeting of National Goals through AI integration- Assessment of AI integrated learning.

SUGGESTED ACTIVITIES:

1. Select any one topic in the B.Ed. syllabus and integrate ICT in the selected topic
2. Create an online community to integrate the students and teachers in the classroom
3. Administer a Test using ICT
4. Create a personal blog and upload the ICT tools in the blog
5. Visit a nearby Teacher Education Institution and teach the students using ICT

TEXTBOOKS:

1. Kulkarni, S.S. (1986). *Introduction to Educational Technology*. Oxford & IBH.
2. Kumar, K.L. (1997). *Educational Technology*. New Age International (P) Ltd
3. Mangal, S.K. (2002). *Essentials of teaching learning and information technology*.

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PRIST DEEMED TO BE UNIVERSITY
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M.Ed.SYLLABUS-SEMESTER-IV
SPECIALIZATIONCORECOURSE-XGUIDANCE AND
COUNSELINGCOURSECODE:22230SC45

COURSE OBJECTIVES:

1. Enable the students to explain the conceptual aspects of Guidance and procedural aspects of guidance services.
2. Make the students to understand the knowledge about theoretical and procedural issues in Educational and Vocational guidance.
3. Enable the students to explain the role of counsellor, and Teacher in the guidance programme.
4. Enable the students to identify the different activities rendered by the different guidance personnel.
5. Make the students to familiarize with self, group and career appraisal techniques.

UNIT-I: CONCEPT OF GUIDANCE

Guidance - Concept, need, scope, assumptions, issues and problems of guidance. Difference between Guidance and Counselling. Bases of Guidance - Philosophical, Psychological and Sociological. Types of Guidance - Educational, Vocational, Recreational and Moral, Personal, Leadership and Health, Group and Individual Guidance. Aims and Objectives of Guidance - as per the recommendations of Kothari Commission.

UNIT-II: THE GUIDANCE SERVICE

Organizing Guidance service in School - Principles and importance, Role of Headmaster, Teachers, Parents and Counsellor's in organizing guidance services in School. Pupil Personal work - Its nature, scope and relation to vocational guidance. The Student Information Services, the Counselling Services, Placement Service, Occupation Information Service, Individual Inventory Service.

UNIT-III: TECHNIQUES AND THEORIES OF GUIDANCE

Techniques - Testing and Non-Testing. Essential in launching Guidance Programme - Science of information needed, use of interview and questionnaire in collecting information. Appraisal of Personal quality and interest - Inventory, Rating Scales, Anecdotal Record, Socio-metric methods, Cumulative Record Cards. Theories of Vocational Guidance - Ginsberg's theory and Super's Vocational Choice Theory.

UNIT-IV: COUNSELLING

Counselling - Concept, steps, Individual and group, Counselling, Approaches of Counselling - Directive Counselling, Non Directive Counselling, Eclectic Counselling and their utility, Role of the Career Master. Vocational Counselling Service - Nature, Qualification of the Vocational Counsellor. Place of counselling in a vocational guidance programme, counselling for all, setting, preparing and conducting the interview, Teacher Counsellor, Vocational Counsellor, Characteristics of a Coordinator.

UNIT-V: GUIDANCE FOR EXCEPTIONAL CHILDREN

Guidance for Exceptional Children - Meaning and Types. Guidance for gifted, backward, mentally retarded, orthopedically handicapped, visually impaired, deaf and dumb, juvenile delinquents guidance for dropouts - Socially disadvantaged children - Alcoholics Addicts - Sexual harassment - Eve teasing - Gender discrimination - Exemptions in examination for exceptional children.

SUGGESTED ACTIVITIES:

1. Conduct an interview of B.Ed students of any college, to find out the burden/psychological effects of practical/other programme. Mention how counsel/guide them


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SCHOOL OF ARTS AND SCIENCE
DEPARTMENT OF MICROBIOLOGY

Minutes of Board of Studies Meeting

The Board of Studies meeting for the department of Microbiology is held on 28.4.2022 at 11 a.m. in, PRIST Deemed to be University, Thanjavur under the chairmanship of Dr.A.Xavier Fernandes.

The following members were present:

1. Dr.A.Xavier Fernandes /Assistant Professor, PRIST (Member, BOS)
2. Dr. L.Chinnappa / Dean, PRIST (BOS, Member)
3. Dr. S. Ramesh, Professor, PRIST (Member, BOS)
4. Dr.S.Mohanraj /Associate Professor. (BOS, Member)
5. Dr. T. Ushadevi/ Associate Professor PRIST (Member, BOS)
6. Dr. K. Sundar / Assistant Professor, PRIST (Member, BOS)
7. Dr. R. Sathya/Assistant Professor, PRIST (Member, BOS)
8. Dr.A.Xavier Fernandes /Assistant Professor, PRIST (Member, BOS)
9. Dr. P. Anantharaman Professor, CAS in Marine Biology, Annamalai University (External Member, BOS)

The Chairman (BOS) welcomed all the members and presented the feedback about existing curriculum received from various Stakeholders and also from the department academic advisory committee.

The members of the Board have unanimously discussed and carefully reviewed the existing syllabus for (B.Sc., Microbiology, M.Sc., Microbiology and M.Phil.) in detail and made the necessary changes in upcoming (B.Sc., Microbiology, M.Sc., Microbiology and M.Phil.) as mentioned below.

I.Resolved to introduce the following New Discipline elective Courses in the B.Sc., (Microbiology) programme curriculum with effect from 2022-2023

I. To improve the skill development in Microbiology

S.No	Course Code	Course Name	Year of introduce
1.	Bioinoculants	22116DSC54A	2022
2.	Bioremediation practices	22116DSC54B	2022
3.	Advanced immunology	22116DSC54C	2022
4.	Genomics and proteomics	22116DSC54D	2022
5.	Bioethics	22116DSC63A	2022
6.	Biomolecules	22116DSC63B	2022
7.	Medical Microbiology	22116DSC63C	2022
8.	Bacterial Genetics	22116DSC63D	2022
9.	Immunotechnology	22216DSC15A	2022
10.	Aquatic Microbiology	22216DSC15B	2022
11.	Food Technology	22216DSC15C	2022
12.	Modern Industrial Biotechnology	22216DSC15D	2022
13.	Clinical research and development	22216DSC25A	2022
14.	Soil and Water Engineering	22216DSC25B	2022
15.	Fungal Immunology	22216DSC25C	2022
16.	Pollution Research	22216DSC25D	2022

17.	Microalgal Technology	22216DSC34A	2022
18.	Drug Development Product Management	22216DSC34B	2022
19.	Biomolecules and Polymers	22216DSC34C	2022
20.	Nanotechnology	22216DSC34D	2022
21.	Molecular Immunology	22216DSC44A	2022
22.	Metabolic Engineering of Bacteria	22216DSC44B	2022
23.	Toxicology	22216DSC44C	2022
24.	Biomedical Science	22216DSC44D	2022

II. To improve the Value-added course

S.No	Name of the Course	Course code	Year of introduce
1.	Certificate Course on Food processing	22516FP	2022
2.	Certificate Course on Clinical Laboratory Technology	22516CLT	2022

2. Resolved to introduce "Bioinoculants/ 20116DSC54A" has to be retained as it is without any changes, but the new course code 22116DSC54A is implemented Unit I to V content newly added:

UNIT I:

Mineralization of Organic & Inorganic Matter in Soil. Biological Nitrogen fixation- Chemistry and Genetics of BNF. Phytopathology and Disease cycle of Plant pathogens - Tikka and Citrus canker, Types of disease symptoms, Structural and Inducible biochemical defenses - Systemic Acquired Resistance (SAR), pathogenesis related (PR) proteins, Plantibodies, Phenolics, Phytoalexins

UNIT II:

Microbial Interactions - Mutualism, Commensalism, Amensalism, Synergism, Competition, Rhizosphere- Rhizosphere effect, Mycorrhizae – Types, Endophytes, PGPR- Plant growth promoting bacteria- symbiotic (Bradyrhizobium, Rhizobium, Frankia), Non-Symbiotic (Azospirillum, Azotobacter, Mycorrhizae, MHBs, Phosphate solubilizers, algae), Novel combination of microbes as biofertilizers, PGPRs. Biofertilizers and Biocontrol agents – Types, benefits and application. Advantages, social and environmental aspects - Bt crops, golden rice.

UNIT III:

Components of Environment: Hydrosphere, lithosphere, atmosphere, and biosphere – definitions with examples; Energy flow in the ecosystem- Carbon, Nitrogen, Sulfur and Phosphorous cycles. Physical factors affecting distribution of microorganisms in various environments. Predisposing factors for Environmental diseases – infectious and control of these diseases.

UNIT IV:

Waste management – Solid waste - Types - management - Factors affecting solid waste generation rates. Biological reference standards. Utilization of Solid Waste as Food, Feed and Fuel- Composting, Vermicomposting, Bio manure and Biogas production, E waste management

UNIT V:

Degradation of organic matter - lignin, cellulose, hemicellulose, pectin, common pesticides- herbicides (2,4-D) and pesticides (DDT), heavy metals. Biodegradation of Xenobiotics - Recalcitrant Halocarbons, Recalcitrant TNTs, PCBs and Synthetic polymers.

SCHOOL OF ARTS AND SCIENCE

Department of Microbiology

Composition of Board of Studies 2022-2023

	Designation	Name	Qualification	Designation & Affiliation	Mail id
1	Chairperson /HoD	Dr.A.Xavier Fernando	<u>M.Sc., M. ED</u> <u>M.Phil. Ph.D.</u>	Assistant Professor, PRIST Deemed to be University, Vallam, Thanjavur	a.xavierfernandes@gmail.com
2	External Expert-Academic	Dr. K.Kavitha	M.Sc., PhD	Assistant Professor, Dept. of Environmental & Herbal Science, Tamil University, Thanjavur	kavikiruthiga@gmail.com
3	External Expert-Industry	Dr.Manjula Kesavan	M.Sc., PhD	Managing Director, Bio Techno Solutions Training and Research Institute Trichy-004 TN	mznjulashami@gmail.com
4	Professor	Dr. S. Ramesh	M.Sc.,Ph.D.	Professor, PRIST Deemed to be University, Vallam, Thanjavur	ramesh@prist.ac.in
5	Associate Professor	Dr.S.Mohanraj	M.Sc.,Ph.D.	Associate Professor, PRIST Deemed to be University, Vallam, Thanjavur	sundar@prist.ac.in
6	Associate Professor	Dr. T. Ushadevi	<u>M.Sc., M.Phil., B. Ed., Ph.D.</u>	Associate Professor, PRIST Deemed to be University, Vallam, Thanjavur	ushadevi29@gmail.com
7	Assistant Professor	Dr.K. Sundar	<u>M.Sc., Ph.D.</u>	Assistant Professor, PRIST Deemed to be University, Vallam, Thanjavur	sundar@gmail.com
8	Assistant Professor	Dr. R. Sathya	M.Sc., M.Phil., PhD	Assistant Professor, PRIST Deemed to be University, Vallam, Thanjavur	sathyaram1984@gmail.com
9	Assistant Professor	Dr.A.Xavier Fernando	<u>M.Sc., M. ED</u> <u>M.Phil. Ph.D.</u>	Assistant Professor, PRIST Deemed to be University, Vallam, Thanjavur	a.xavierfernandes@gmail.com
10	Special Invitee-Dean	DR. L.Chinnappa	<u>M.Sc., M.Phil., B. Ed., Ph.D.</u>	Dean, School of Arts and Science, PRIST Deemed to be University, Vallam, Thanjavur	deanarts@prist.ac.in
11	Special Invitee-Alumnus/Alumna	S.Supraja	PG	Research Assistant II, TANBIO R&D Solution, Trichy	tamilselvan20@gmail.com
12	Special Invitee -Current student - UG or PG	R. KarthickRaja	PG	STUDENT	raja@gmail.com

Signature of the Chairman & Members

	Designation	Name	Qualification
1	Chairperson/HoD	Dr.A.Xavier Fernandes	A. Xavier
2	External Expert-Academic	Dr. K.Kavitha	K. Kavitha
3	External Expert- industry	Dr.Manjula Kesavan	Manjula
4	Professor	Dr. S. Ramesh	S. Ramesh
5	Associate Professor	Dr.S.Mohanraj	S. Mohanraj
6	Associate Professor	Dr. T. Ushadevi	T. Ushadevi
7	Assistant Professor	Dr.K.Sunder	K. Sunder
8	Assistant Professor	Dr. R. Sathya	R. Sathya
9	Assistant Professor	Dr.A.Xavier Fernandes	A. Xavier
10	Special Invitee-Dean	DR. L.Chinnappa	L. Chinnappa
	Special Invitee- Alumnus/Alumna	S.Supraja	S. Supraja
11	Special Invitee -Current student - UG or PG	R. KarthickRaja	R. KarthickRaja

A. Xavier
HOD
 Head of the Department
 Department of Microbiology
 School of Arts & Science
 Prist Deemed to be University, Thanjavur.

L. Chinnappa
Dean
 Dean of Arts & Science
 Prist Deemed to be University
 Thanjavur - 613 163, Tamilnadu.

Course Code	Course Title	L	T	P	C
22116DSC54B	Bioremediation practices	5	0	0	4

UNIT – I

Wastes– Classification and Quantification – Solid Waste Management and Disposal: Sources and Generation of Solid Waste – characterization, composition and classification. Hazardous Waste Management: Cyanides, Dioxins, Detergents, Plastics, Nylon and Paper. Waste Minimization approaches – Monitoring and Management strategies. Radioactive Waste: Sources, half life of radioactive elements, modes of decay. Effects on Plants, Animal and Man. Low and High-level Radioactive Waste Management – Waste Minimization and Treatment, Radiation standards.

UNIT - II

Recycling of Wastes – Types – sources – composition of waste – recycling of waste for Industrial, Agricultural and Domestic Purposes; Recycling of Metals, Reuse, recovery and reduction of paper and plastics; Recycling in Food Manufacturing, Beverages, Apparel, Leather, Paper, Pulp, Chemical and other industries; Fly Ash utilization. Waste Disposal Methods – composting, incineration, pyrolysis, medical waste disposal strategies.

UNIT – III

Microbial Activity in Soil and Ground Water, Lithosphere as Microbial habitat, Microorganisms in rock and minerals, Mineral soil and Organic soil. Biomobilization of silicon, phosphate, nitrogen. Geomicrobiology of fossil fuel, methane, peat, coal and petroleum.

UNIT – IV

Principles of Bioremediation – Rapid growth and Metabolism- Genetic plasticity – Metabolic pathways for the degradation of xenobiotics, hydrocarbons – Microbial site characterization – Quantification of biodegradation; Biocleaning -Chernobyl radioactive contaminated area - Phytoremediation.

UNIT – V

Aerobic Bioremediation: Bioremediation of Surface Soils: Fate and transport of contaminants in the Vadose zone – Biodegradation in soil ecosystems – Types of soil treatment systems – Bioreactors. Subsurface Aerobic Bioremediation- Bioremediation in fresh water and marine systems: Bioremediation: Anoxic/Anaerobic Processes –Fermentation, Degradation of xenobiotics. – Anoxic/Anaerobic bioremediation of hydrocarbons, Phenols, Heterocyclic Compounds, Cyanide, dyes,

Course Code	Course Title	L	T	P	C
22116DSC54BC	Advanced Immunology	5	0	0	4

Unit I

Molecular And Cellular Mechanisms Of Disease Prevention By The Immune System

- ❖ Immunity against bacteria.
- ❖ Immunity against viruses.
- ❖ Vaccines.

Unit II

Molecular And Cellular Mechanisms Of Disease Prevention By The Immune System

- ❖ Immunity against parasites.
- ❖ Immunity against cancer. 1. Tumor Immunology.

Unit III

Molecular And Cellular Mechanisms Of Disease Prevention By The Immune System

- ❖ Immunity against cancer. 2. Cancer immunotherapy.

Unit IV

Diseases Related With The Immune System

- ❖ Organ transplantation and immune rejection.
- ❖ Autoimmune diseases.

Unit V

Diseases Related With The Immune System

- ❖ Primary Immunodeficiencies.
- ❖ AIDS.
- ❖ Hypersensitivity reactions, Allergies.

Course Code	Course Title	L	T	P	C
20116DSC54D	Genomics and proteomics	4	1	0	3

Unit I

Introduction to protein structure, Chemical properties of proteins. Physical interactions that determine the property of proteins. Short-range interactions, electrostatic forces, Van der Waal interactions, hydrogen bonds, hydrophobic interactions.

Unit II

Proteomics: structural, functional, expression, interaction proteomics. Importance of proteomics. Determination of protein sizes (Sedimentation analysis, gel filtration, SDS-PAGE); Native PAGE,

Unit III

Protein-protein interactions, gel based proteomic tools e.g. 2D, DIGE, Non-gel based proteomic tools, Gel based proteomics, LC-based proteomics.

Unit IV

Protein array, Protein Identification and data evaluation, Identification of post-translational modifications: Phosphorylation, Glycosylation, Acetylation

Unit V

Mass Spectrometry-Fundamental parameters: Mass accuracy, Resolution, Sensitivity, Ion sources: Electrospray ionization, Matrix assisted laser desorption and ionization. Peptide mass finger printing, Tandem mass spectrometry

Course Code	Course Title	L	T	P	C
20116DSC63A	Bioethics	4	1	0	3

UNIT – I

General Ethical concerns: the use of nature, Different views of nature, Dynamic nature, interfering with nature, integrity of species; Reducing genetic diversity; Biological warfare; public perception of science.

UNIT – II

Medical ethics; History and culture: The Hippocratic tradition: a profession, Philanthropy, Do no harm, adoption to the oath by western medicine. Competing ethical

Traditions; Retaining the Hippocratic oath.

UNIT – III

Status of Human embryo: Human Embryonic development; Ethics through embryo development: Fertilization, the fetus and feeling pain; Scientific Research on Human Embryos: Experimental goals of Human Embryo Research, Human Development: How much Embryo experimentation in ethical?

UNIT – IV

Animal Rights: Making new strains of animal: Ethical limits of animal use; Religious views of animal status; Philosophical views of animal status; regulations.

UNIT – V

Human Gene therapy: Ethics of somatic cells gene therapy: Efficiency of treatment; safety of transferred genes; protecting human life; Affect on family life; Economic factors.

Course Code	Course Title	L	T	P	C
20116DSC63B	Biomolecules	5	0	0	4

Unit I

Carbohydrates: Structure and biological functions of Mono, di and Polysaccharides. Types of polysaccharides: Homo polysaccharides -chitin, fructans, mannans, xylans, and galactans. Structure and biological importance of Hetero polysaccharides- Glycoprotein – bacterial cell wall polysaccharides, marine polysaccharides and Lectins.

Unit II

Aminoacids and its general properties. Classification of amino acids. Proteins– classification and general properties. Orders of protein structure, Primary- Secondary: structure– the α -helix, β -pleated sheet. Protein sequencing methods.

Unit III

Lipids: Definition and classification of lipids. Biological significance of lipids. Types of Fatty acids-Essential, Non essential. Structure and biological functions of phospholipids, sphingolipids, glycolipids. Steroids – structure and functions of cholesterol, bile acids, sex hormones, ergosterol. Structure and biological role of prostaglandins, thromboxanes and leukotrienes.

Unit IV

Nucleic acid: Structure of purines, pyrimidines, nucleosides and nucleotides. DNA double helical structure. A, B and Z forms of DNA. Properties of DNA- Density, viscosity, hypochromicity, denaturation and renaturation. DNA sequencing– chemical and enzymatic methods. Chemical synthesis of DNA. RNA– types and biological role- Secondary, tertiary structures of RNA.

Unit V

Vitamins: Definition and Classification - Source, Structure and biological role - Daily requirements and deficiency manifestation of fat soluble vitamins and water soluble vitamins.

Course Code	Course Title	L	T	P	C
20116DSC63C	Medical Microbiology	5	0	0	4

Unit – I

Normal microbial flora of human – Host – parasite interaction: The Process of infection. Infective syndromes and diagnostic procedure - Strategy of antimicrobial therapy – Epidemiology and control of community infections.

Unit – II

General properties, epidemiology, transmission, pathogenesis, Symptoms, laboratory diagnosis, prevention and Treatment of the following Bacterial diseases: a) Pneumonia, b) Whooping-cough, c) Meningitis d) Diphtheriae) Pulmonary Tuberculosis, f) Leprosy, g) Typhoid, h) Cholera i) Tetanus, j) Syphilis, k) Gonorrhoea, d) Dental carries.

Unit - III

Mycobacterium: Mycobacterium tuberculosis, Mycobacterium leprae. Spirochaetes, Mycoplasma, Actinomycetes, Helicobacter, Compylobacter and other miscellaneous bacteria, Rickettsia, Chlamydia.

Unit – IV

General properties, epidemiology, transmission, pathogenesis, Symptoms, laboratory diagnosis, prevention and Treatment of the following viral diseases: Small pox, Influenza, Measles, Poliomyelitis, Common cold(Rhino virus), Hepatitis, Encephalitis, Rabies, AIDS.

Unit – V

Pathogenic Fungal diseases- Superficial, Subcutaneous and systemic mycoses, Protozoa-Amoebiasis, Malaria, Helminthes-Liverfluke, Filariasis, Hospital acquired infections: Hospital infections Principles of control – Committee – functions; Hospital waste disposal – Ethical committee – functions.

Course Code	Course Title	L	T	P	C
20116DSC63D	Bacterial Genetics	4	1	0	3

Unit -I

History and achievements of rDNA technology. Nomenclature, classification of Restriction Endonucleases - ligases, types - gene cloning in prokaryotes - Expression and cloning strategies. Construction of genomic library and cDNA library.

Unit II

Restriction enzymes - restriction analysis of genomes- restriction sites- cloning of blunt end DNA, adapters. DNA analysis: labeling of DNA and RNA probes. Southern and fluorescence *in situ* hybridization, DNA fingerprinting, chromosome walking.

Unit- III

Gene transfer Techniques - Physical - Biolistic method, Chemical - Calcium chloride and DEAE methods, Biological invitro package method - Screening and selection of recombinants.

Unit-IV

Microbial synthesis of commercial products - Insulin, Interferons, Human growth hormone, antibiotics, biopolymers.

Unit- V

Transgenic Plants - Ti plasmid, insect resistant plant. Transgenic animal - mice - retroviral method- DNA microinjection method. PCR methods and its applications.

Course Code	Course Title	L	T	P	C
22216DSC15A	Immunotechnology	5	0	0	4

Unit – I

Introduction: History of immunology – types of immunity – Innate and Acquired – Passive and Active - Humoral and cell Mediated Immunity. Lymphoid organs – autoimmunity, physiology of immune response – Immunohaematology

Unit - II

Antigens and Antibodies: Antigens – structure and properties – types – ISO and allo –haptons; adjuvants – antigen specificity, vaccines and toxoids. Immunoglobulins – structure - heterogeneity – types and subtypes – properties (physico – chemical and biological); theories of antibody production - Complement – structure – components - properties and functions of complement components; complement pathways and biological consequences of complement activation.

Unit - III

Major Histocompatibility complex: Structure and function of MHC and the HLA system. Gene regulation and Ir – genes. HLA tissue and transplantation – tissue typing methods for organ and tissue transplantation in humans; Graft versus host reaction and rejection. Autoimmunity –diseases-mechanism and disease with their diagnosis

Unit - IV

Tumor Immunology: tumour antigens – immune response to tumors; immunodiagnosis of tumors – detection of tumor markers: alphafoetal proteins, carcinoembryonic antigen etc. Immunotherapy of malignancy, Hypersensitivity – monoclonal antibody – production and their applications

Unit - V

Immunological techniques and their principles: In vitro of immunological methods – agglutination, precipitation, complement fixation, Immunofluorescence, ELISA, Radio Immuno Assays, Immunodiffusion, Immunoelectrophoresis, isoelectric focusing – cytotoxicity assay – labeled – antibody technique in light and Electron Microscopy and Immunohistochemistry. Techniques of Immunization – use of adjuvants – separation of lymphocytes – and preparation of Rosette forming cells - In vivo methods – skin tests and immune complex tissue demonstrations - Applications of these methods in diagnosis of microbial diseases.

Course Code	Course Title	L	T	P	C
22216DSC15B	Aquatic Microbiology	5	0	0	4

UNIT I

Aerobiology, Microbial contamination of air, Sources of contamination, Microbial indicators of air pollution. Enumeration of bacteria in air, Air sampling devices. Air sanitation. Effect of Air Pollution on plants and humans.

UNIT II

Aquatic microbiology: Microbiology of water, Water pollution and water borne pathogens, Bacteriological examination of water, Indicator organisms. Purification and disinfection of water Microbiology of sewage, Waste water treatment, BOD, COD. Role of microbes in marine fouling

UNIT III

Microbial flora of soil and factors affecting them, Key processes and role of microorganisms in Nitrogen, Carbon, Phosphorus, Sulphur and Iron cycles.

UNIT IV

Microbial interaction – Plant-microbe, microbe-microbe interactions. Endophytes, PGPR- mechanisms of plant growth promotion by PGPR, Plant Microbiome, Mycorrhiza, Biological Nitrogen fixers-Symbiotic and free living nitrogen fixers- physiology and genetics of nitrogen fixers, Phosphate solubilizers, Phytopathogens – Bacterial, fungal, Viral diseases. (Wilt, Blight, Canker, Mosaic, Rhizome rot of ginger etc.) – Control measures. Biofertilizers, Microbial control of pests and diseases. Bt-toxin- mode of action and applications. Integrated pest management. GM crops and its importance

UNIT V

Recycling of liquid and solid wastes – Composting – Biogas – Biodegradation. Bioremediation, Bioleaching, Xenobiotic degradation. Microbial corrosion- Biofilms degradation of petroleum products. Microbes in mineral leaching and metal concentration, Microbial enhanced oil recovery

Course Code	Course Title	L	T	P	C
22216DSC15C	Food Technology	5	0	0	4

UNIT I

Principles of fresh food storage: Nature of harvested crop, plant, animal; product storage; effect of cold storage and quality – storage of grains.

UNIT II

Processing and preservation by heat: Blanching, pasteurization, sterilization and UHT processing, canning, extrusion cooking, dielectric heating, microwave heating, baking, roasting and frying. Retort processing of Ready to eat (RTE) products. Newer methods of thermal processing – batch and continuous.

UNIT III

Processing and preservation by low Temperature: refrigeration, freezing, CA, MA, and dehydrofreezing. Food irradiation, history and mechanism, the electro-magnetic spectrum, forms of radiant energy. Principles of using electromagnetic radiation in food processing, ionizing radiations and non ionizing radiations, advantages and disadvantages. Controlling undesirable changes in food during irradiation.

UNIT IV

Processing and preservation by drying, concentration and evaporation: Drying – water activity, microbial spoilage due to moisture. Dehydration of fruits, vegetables, milk, animal products. Various methods employed in production of dehydrated commercial products, selection of methods based on characteristics of foods to be produced, advantages and disadvantages of different methods, sundrying, tray or tunnel drying, spray drying, drum drying, freeze drying, fluidized bed drying. Physical and chemical changes during drying control of chemical changes, desirable and undesirable changes. Packaging and storage of dehydrated products: Food Concentration- methods of food concentration, freeze concentration, Ultra-filtration, reverse osmosis.

UNIT V

Processing and preservation by non-thermal methods: High pressure, pulsed electric field, hurdle technology. GRAS and legal aspects for gamma irradiation. Permissible limits for chemical preservatives. Use and application of enzymes and microorganism in processing and preservation of foods; food fermentations, pickling smoking ; Food additives; Definition, types and functions, permissible limits and safety aspects. Chemical Preservatives- type I and type II.

Course Code	Course Title	L	T	P	C
22216DSC15D	Modern Industrial Biotechnology	5	0	0	4

UNIT I

History of Biotechnology, Traditional and New Biotechnology, Scope & Importance of Biotechnology. Branches of Biotechnology, Present Status of Biotechnology in India and their research Disciplines. Branches of Biotechnology: Red Biotech, White/Grey Biotech, Green Biotech, Blue Biotech.

UNIT II

Production of useful compounds: ethanol, lactic acid, citric acid. Production of antibiotics: Penicillin, Streptomycin. Production of enzymes: α -amylase, proteases, lipases. Single cell proteins (SCP) from bacteria, yeast, fungi and algae for human feed and animals feed (as supplements). Fuel (ethanol, biogas) production from cheap, less useful and abundant substrates such as sugarcane bagasse, wood (biofuel & bioenergy).

UNIT III

Gene transfer methods in Animals – Microinjection, Embryonic Stem cell, gene transfer. Transgenic Animals – Mice, Cow, Pig, Sheep, Goat, Bird, Insect. Animal propagation – Artificial insemination, Animal Clones. Introduction to Stem Cell Technology and its applications. Genetic modification in Medicine - gene therapy, vectors in gene therapy, molecular engineering, human genetic engineering, problems & ethics. Human Genome Project (HGP) – an overview of the project, goals of the project, major scientific strategies & approaches used in HGP, expected scientific & medical benefits of this project. Principle of DNA fingerprinting and its application.

UNIT IV

Plant Tissue Culture applications – micropropagation, from callus to plant, somatic embryogenesis, soma clonal variation, valuable germplasm, chemicals from plants, genetically engineered plants. Applications of Plant Genetic Engineering – crop improvement, herbicide resistance, insect resistance, virus resistance. Genetic modification in Agriculture – transgenic plants, genetically modified foods, application, future applications, ecological impact of transgenic plants, their future applications.

UNIT V

Fundamentals, methods and strategies of application (biostimulation, bioaugmentation) – examples, bioremediation of metals (Cr, As, Se, Hg), radionuclides (U, Te), organic pollutants (PAHs, PCBs, Pesticides, TNT etc.), technological aspects of bioremediation (in situ, ex situ).

Course Code	Course Title	L	T	P	C
22216DSC25A	Clinical research and development	5	0	0	4

UNIT I:

Microbiology Laboratory Safety Practices -General Safety Guidelines, Handling of Biological Hazards, Infectious health care waste disposal - Biomedical waste management, Emerging and Re-emerging infections.

UNIT II:

Diagnostic procedures - General concept of Clinical specimen collection, transport, storage and general processing in Microbiology laboratory - Specimen acceptance and rejection criteria.

UNIT III:

Diagnosis of microbial diseases - Clinical, differential, Microbiological, immunological and molecular diagnosis of microbial diseases. Modern and novel microbial diagnostic methods. Automation in Microbial diagnosis.

UNIT IV:

Antibiotic sensitivity tests - Disc diffusion - Stokes and Kirby Bauer methods, E test - Dilution - Agar dilution & broth dilution - MBC/MIC - Quality control for antibiotics and standard strains.

UNIT V:

Nosocomial infections – common types, sources, reservoir and mode of transmission, pathogenesis and control measures. Hospital Infection Control Committee (HICC) – Functions.

Course Code	Course Title	L	T	P	C
22216DSC25B	Soil and Water Engineering	5	0	0	4

UNIT I:

Soil Microbiology– Soil as Microbial Habitat, Soil profile and properties, Soil formation, Diversity, and distribution of major group of microorganisms in soil. Quantification of soil microflora, role of microorganism in soil fertility. Mineralization of Organic & Inorganic Matter in Soil. Biological Nitrogen fixation- Chemistry and Genetics of BNF. Phytopathology and Disease cycle of Plant pathogens - Tikka and Citrus canker, Types of disease symptoms, Structural and Inducible biochemical defenses - Systemic Acquired Resistance (SAR), pathogenesis related (PR) proteins, Plantibodies, Phenolics, Phytoalexins

UNIT II:

Microbial Interactions - Mutualism, Commensalism, Amensalism, Synergism, Competition, Rhizosphere- Rhizosphere effect, Mycorrhizae – Types, Endophytes, PGPR- Plant growth promoting bacteria– symbiotic (*Bradyrhizobium*, *Rhizobium*, *Frankia*), Non-Symbiotic (*Azospirillum*, *Azotobacter*, Mycorrhizae, MHBs, Phosphate solubilizers, algae), Novel combination of microbes as biofertilizers, PGPRs. Biofertilizers and Biocontrol agents – Types, benefits and application. Advantages, social and environmental aspects - Bt crops, golden rice.

UNIT III:

Components of Environment: Hydrosphere, lithosphere, atmosphere, and biosphere – definitions with examples; Energy flow in the ecosystem- Carbon, Nitrogen, Sulfur and Phosphorous cycles. Physical factors affecting distribution of microorganisms in various environments. Predisposing factors for Environmental diseases – infectious (water and air borne) and pollution related, spread and control of these diseases. Treatment and safety of drinking (potable) water, methods to detect potability of water samples. Space microbiology - Microbiological research in space environment.

UNIT IV:

Waste management – Solid waste- Types - management - Factors affecting solid waste generation rates. Industrial effluent treatment, primary, secondary, tertiary, and advanced treatment process. Quality assessment of decontaminated matters and other biological effluents. Biological reference standards. Utilization of Solid Waste as Food, Feed and Fuel- Composting, Vermicomposting, Bio manure and Biogas production. E waste management

UNIT V:

Degradation of organic matter - lignin, cellulose, hemicellulose, pectin, common pesticides- herbicides (2,4-D) and pesticides (DDT), heavy metals. Biodegradation of Xenobiotics - Recalcitrant Halocarbons, Recalcitrant TNTs, PCBs and Synthetic polymers. Biodegradation of Hydrocarbons. Biodeterioration of Textiles and Leather. Pollution Control Bodies and Environmental laws in India. Environmental impact assessment, EIA guidelines, US Environment protection Agency norms

Course Code	Course Title	L	T	P	C
22216DSC25c	Fungal Immunology	5	0	0	4

UNIT I FUNGAL PROPERTIES

Fungi - Structure and cell differentiation- unicellular and multicellular forms. Modes of reproduction -sexual, asexual and para sexual, life cycle patterns. Growth requirements and cultivation. Virulence factors. Detection and recovery of fungi from clinical specimens. Advances in diagnostic mycology. Antifungal agents- type and mode of action, testing methods and quality control. Immunity to fungal infection.

UNIT II MYCOSES

Superficial Mycoses- Dermatophytosis, Piedra, Pityriasis versicolor, Tinea nigra. Subcutaneous Mycoses- Mycetoma, Sporotrichosis, Chromoblastomycosis, Phaeohyphomycosis, Rhinosporidiosis. Histoplasmosis, Blastomycosis, Coccidioidomycosis and Paracoccidioidomycosis. Opportunistic mycoses-Candidiasis, Cryptococcosis, Aspergillosis, Zygomycosis, Dimatiaceous fungi.

UNIT III PROTOZOOLOGY

Host – parasite relationship, Lab diagnosis of parasitic infections. Pathogenic mechanism, transmission, life cycle, lab diagnosis of Protozoans – Entamoeba, Giardia, Trichomonas, Balantidium.

UNIT IV HAEMOFLAGELLATES

Trypanosomes- Leishmania, Trypanosoma and Sporozoites- Plasmodium. Coccidia- Toxoplasma, Cryptosporidium.

UNIT V HELMINTHOLOGY

Cestodes - Taenia solium and T. saginata, Echinococcus. Trematodes – Fasciola hepatica, Fasciolopsis buski, Paragonimus, Schistosoma. Nematodes – Ascaris, Ancylostoma, Trichinella, Trichuris, Strongyloides, Enterobius, Filarial worms- Wuchereria, Brugia, Loa Loa, Dracunculus, Onchocerca; and other parasitic infections in immunocompromised hosts and AIDS associated parasites.

Course Code	Course Title	L	T	P	C
22216DSC25D	Pollution Research	5	0	0	4

UNIT I

Environmental Impact Assessment: Definition, significance and scope of impact assessment, need & objective, types of environmental impacts, methods of environmental assessments.

UNIT II

Municipal Solid wastes: - Characteristics, generation, collection and transportation of solid wastes, engineered systems for solid waste management (reuse/ recycle, energy recovery, treatment and disposal).

UNIT III

Project management and control: - Project cycle, organization, planning, scheduling, monitoring, updating and management system.

UNIT IV

Environmental analysis, safety and health, pollution control, surveillance, setting standards and control

UNIT V

Legal framework, organisation for control and pollution control laws, acts and bylaws

Course Code	Course Title	L	T	P	C
22216DSC34A	Microalgal Technology	5	0	0	4

UNIT I:

Introduction to Algae - General characteristics. Classification of algae according to Fritsch. Salient features of different groups of algae. Distribution - Freshwater, brackish water and marine algae. Identification methods. An overview of applied Phycology. Economically important microalgae.

UNIT II:

Cultivation of freshwater and marine microalgae - Growth media. Isolation and enumeration of microalgae. Laboratory cultivation and maintenance. Outdoor cultivation - Photobioreactors - construction, types and operation; raceway ponds - Heterotrophic and mixotrophic cultivation - Harvesting of microalgae biomass.

UNIT III:

Microalgae in food and nutraceutical applications - Algal single cell proteins. Cultivation of *Spirulina* and *Dunaliella*. Microalgae as aquatic, poultry and cattle feed. Microalgal biofertilizers. Value-added products from microalgae. Pigments - Production of microalgal carotenoids and their uses. Phycobiliproteins - production and commercial applications. Polyunsaturated fatty acids as active nutraceuticals. Microalgal secondary metabolites - Pharmaceutical and cosmetic applications

UNIT IV:

Microalgae in environmental applications. Phycoremediation - Domestic and industrial waste water treatment. High-rate algal ponds and surface-immobilized systems - Treatment of gaseous wastes by microalgae. Sequestration of carbon dioxide. Scavenging of heavy metals by microalgae. Negative effects of algae. Algal blooms, algicides for algal control

UNIT V:

Microalgae as feed stock for production of biofuels - Carbon-neutral fuels. Lipid-rich algal strains - *Botryococcus braunii*. Drop-in fuels from algae - hydrocarbons and biodiesel, bioethanol, biomethane, biohydrogen and syngas from microalgae biomass. Biocrude synthesis from microalgae. Integrated biorefinery concept. Life cycle analysis of algae biofuels

Course Code	Course Title	L	T	P	C
22216DSC34B	Drug Development Product Management	5	0	0	4

UNIT I:

Drug Development Pathway: how to go from molecule to medicine - target product profile - types of compounds (small molecules - biologics - antibody / drug conjugates, vaccines) - different phases in development, approval, and life cycle management - current and future drug development process - success metrics, timelines, costs.

UNIT II

Target identification and validation - assay development and screening - animal models of disease - Lead identification, lead optimization and clinical candidate selection

UNIT III

Emerging Technologies and approaches in drug development - Use of biomarkers and diagnostics - PHC - Real world data - Use of electronic medical records

UNIT IV

History of Regulation - Regulatory requirements in different countries (focus on FDA and EMA) - Regulatory interactions at different phases of development - CTA - IND - NDA - Tools for expedited review and approval - Safety database - Regulatory compliance and post approval commitments - Pediatrics

UNIT V

Types of Endpoints in Clinical Trials - Blinding, Randomization, and Stratification - Hypothesis Testing and Error Probabilities - Multiple Testing - Interim Analyses - Sample Size and Trial Duration - Minimum Detectable Difference - Confidence Intervals - P-Values

Course Code	Course Title	L	T	P	C
22216DSC34C	Biomolecules and Polymers	5	0	0	4

Unit I: Chemistry of Carbohydrates

Classification of carbohydrates, reducing and non-reducing sugars, biological functions, general properties and reactions of glucose and fructose, their open chain structure, epimers, mutarotation and anomers, reactions of monosaccharides, determination of the configuration of glucose (Fischer proof), the cyclic structure of glucose. Haworth projections. The cyclic structure of fructose. The linkage between monosaccharides: structure of disaccharides (sucrose, maltose, lactose) and polysaccharides (starch and cellulose) excluding their structure elucidation.

Unit II: Nucleosides, Nucleotides and Nucleic Acids

Components of Nucleic acids: Adenine, guanine, thymine, cytosine and uracil (structure only), other components of nucleic acids, nucleosides and nucleotides (nomenclature), structure of polynucleotides; structure of DNA (Watson-Crick model) and RNA (types of RNA), difference between DNA and RNA, genetic code, biological roles of DNA and RNA: replication, transcription and translation.

Unit-III: Lipids

Introduction to oils and fats; common fatty acids present in oils and fats, Hydrogenation of fats and oils, Saponification value, acid value, iodine number. Reversion and rancidity. Lipids: Classification. Biological importance of triglycerides and phosphoglycerides and cholesterol; Lipid membrane, Liposomes and their biological functions and underlying applications. Lipoproteins. Properties, functions and biochemical functions of steroid hormones.

Unit IV: Amino acids, Peptides & Proteins

Amino Acids and Peptides -Zwitterion, isoelectric point and electrophoresis. Preparation of amino acids: Strecker synthesis and using Gabriel's phthalimide synthesis. Reactions of amino acids; ester of -COOH group, acetylation of -NH₂ group, complexation with Cu²⁺ ions, ninhydrin test. DISCIPLINE SPECIFIC ELECTIVE COURSE CHEM-DSE 8: Biomolecule-II 33 Determination of the primary structure of peptides by degradation Edman degradation (Nterminal) and C-terminal (thiohydantoin and with carboxypeptidase enzyme). Synthesis of simple peptides (up to dipeptides) by N-protection (t-butyloxycarbonyl and phthaloyl) & C-activating groups and Merrifield solid-phase synthesis. An Overview of primary, secondary, tertiary and quaternary structure of proteins.

UNIT V : Enzymes

Classification of enzymes and their uses (mention ribozymes). Mechanism of enzyme action, factors affecting enzyme action, coenzymes and cofactors and their role in biological reactions, specificity of enzyme action (including stereo-specificity), enzyme inhibitors and their importance, and the phenomenon of inhibition (competitive and non-competitive inhibition including allosteric inhibition). Drug action-receptor theory. Structure – activity relationships of drug molecules, binding role of -OH group, -NH₂ group, double bond and aromatic ring.

Course Code	Course Title	L	T	P	C
22216DSC34D	Nanotechnology	5	0	0	4

Unit I: Introduction to bionanotechnology

Milestones in History – bionanotechnology – concept and future prospects – application in Life Sciences. Terminologies – nanotechnology, bionanotechnology, nanobiomaterials, biocompatibility, nanomedicine, nanowires, quantum Dots, nanocomposite, nanoparticles, nanosensors. Biotechnology to bionanotechnology, natural bionanomachines. Current status of bionanotechnology.

Unit II: Synthesis of nanoparticles

Molecular nanotechnology – nanomachines – collagen. Uses of nanoparticles – cancer therapy – manipulation of cell and biomolecules. Cytoskeleton and cell organelles. Types of nanoparticles production – physical, chemical and biological. Microbial synthesis (bacteria, fungi and yeast) of nanoparticles – mechanism of synthesis.

Unit III: Types of nanoparticles and methods of characterization

Nanoparticles – types, functions – Silver, Gold and Titanium. Physical and chemical properties of nanoparticles. Characterization of nanoparticles – UV- Vis spectroscopy, particle size analyzer, Electron Microscopy – HRTEM, SEM, AFM, EDS, XRD. Other tools and techniques required for bionanotechnology: rDNA technology, site directed mutagenesis, fusion proteins, X- Ray crystallography, NMR. Bioinformatics: molecular modeling, docking, computer assisted molecular design.

Unit IV: Applications of bionanotechnology

Drug and gene delivery – protein mediated and nanoparticle mediated. Uses of nanoparticles in MRI, DNA and Protein Microarrays. Nanotechnology in health sectors. Nanomedicines, Antibacterial activities of nanoparticles. Nanotechnology in agriculture. Toxicology in nanoparticles – Dosimetry.

Unit V: Merits and demerits of nanoparticles

Advantages of nanoparticles – drug targeting, protein detection, MRI, development of green chemistry – commercial viability of nanoparticles. Disadvantages – pollution and health risks associated with nanoparticles.

Course Code	Course Title	L	T	P	C
22216DSC44A	Molecular Immunology	5	0	0	4

UNIT I

History of Immunology-Jenner, Pasteur, Metchnikoff, Kitasato – Types of immunity – Innate immunity- organs involved- Acquired Immunity – Cells involved- Hematopoietic stem cells – Cells of immune system, T and B cell activation and maturation, Antigens-The molecular basis of antigen and antibody interactions. Organs of Immunity- Primary- Bone marrow, Bursa- Thymus- Secondary lymphoid Organs- Lymph nodes, MALT Spleen.

UNIT II:

Immunoglobulins- General Structure- Types- IgG, IgA, IgM, IgE, IgD Class switching- Hybridoma technology- Monoclonal antibody production and application, Immunologic messenger molecules- Cytokines, Chemokines, interferons interleukins- Complement system: Classical, Alternate, MBL pathway.

UNIT III

Transplantation Immunology- Tissue typing and organ transplantation – MHC gene in human and mouse, MHC class I and class II molecules – Autoimmune diseases: Type-1 Diabetes- Addison's disease and Graves, disease. Immunostimulation and Immunosuppression and their clinical significance.

UNIT IV

Immunity against diseases- HIV- Structure- spread and control- Covid19- Stages of infection- spread and control measures- quarantine. Molecular interaction between T cell and Corona virus-2 - Covid19 Vaccines and their effectiveness - booster dose. Cancer and Tumour immunology – Nobel Prize 2020 for discovery of Immunotherapy for Cancer – 2019 Nobel Prize for discovery concerns the impact of Hepatitis C virus and Cancer.

UNIT V

Techniques in Immunology; Radio Immuno Assay, ELISA, Western Blotting, Immunofluorescence technique, immunohistochemistry. Vaccines– whole organism vaccine, synthetic peptide vaccine, multivalent subunit-anti idotype vaccine, designer vaccine, edible vaccine, DNA vaccine, recombinant vector vaccine; Abzymes, Current scenario of vaccines and vaccination

Course Code	Course Title	L	T	P	C
22216DSC44B	Metabolic Engineering of Bacteria	5	0	0	4

Unit I:

Introduction to Genetics – Great milestones in Genetics; levels of Genetic analysis (Classical, Molecular & Population Genetics); Genetics in Agriculture, Medicine & Society.

Unit II Cells & Chromosomes - Basic cell types – structure & evolutionary relationships, Overview of Prokaryotic & Eukaryotic cells, Cellular environment, Chromosomes – where genes are located.

Unit III Genetics of Cell Cycle – Key events of the Cell cycle, Genetic analysis of the Cell cycle, Regulation of cell cycle, Checkpoints in the cell cycle.

Unit IV Basic principles of Heredity – Segregation of a single gene, the principle & verification of segregation, segregation of two or more genes, test cross with unlinked genes.

Unit V Patterns of Inheritance – Autosomal inheritance, Sex chromosomes & Sex-linked inheritance, Cytoplasmic inheritance.

Course Code	Course Title	L	T	P	C
22216DSC44C	Toxicology	5	0	0	4

UNIT I:

General Introduction - Definition of toxins, different categories of toxins and venoms, recent trends in venom and toxin research.

UNIT II:

Bacterial toxins - Bacterial toxins Bacterial toxinogenesis, endotoxins, exotoxins, exotoxins, bacterial protein toxins with special reference to cholera, diphtheria and tetanus toxins, molecular mechanism of action of endotoxins, exotoxins, enterotoxins, neurotoxins and mycotoxins.

UNIT III:

Plant toxins & Toxins from snake venom - Natural toxins in plants, Plant toxic proteins, impact of plant toxin on human, natural toxins in food, plants, allelopathy. Toxins from snake venom Snakes and Biological significance of their venoms, composition of snake venom, evolution of venom, 3D structure of some important venom constituents and their mechanism of action (phospholipase A2, cardiotoxin, neurotoxin) three-finger toxins, anti-venom and medicinal plants in treatment of snakebite patients.

UNIT IV:

Tools for isolation and characterization of toxins - Multidimensional chromatographic techniques (gel-filtration, ion-exchange reverse-phase HPLC, SDS-PAGE, 2-dimensional gel electrophoresis), toxin mass fingerprinting, N-terminal peptide sequencing, analysis of protein data by using proteomics software.

UNIT V:

Medicinal and industrial applications of venoms and toxins. Use of toxins in neurobiology and muscular research, anticancer drugs, diagnosis of haemostatic disorders, antibacterial agents, bioinsecticides and other industrial applications.

Course Code	Course Title	L	T	P	C
22216DSC44D	Biomedical Science	5	0	0	4

UNIT I

Human Genetics - Principles - History and Impact of Genetics in Medicine - Gregor Mendel and the Laws of Inheritance - The Origins of Medical Genetics - Types of Genetic Disorders (single gene disorders, Chromosomal disorders, Polygenic disorders, Somatic cell genetics, mitochondrial disorders) - The Human Genome Project.

UNIT II

Molecular Genetics & Cytogenetics: DNA sequence polymorphisms SNPs, VNTRs, Minisatellites, Microsatellites. Mapping and Identifying Genes for Monogenic Disorders - Position-Independent Identification of Human Disease Genes - Positional Cloning. The Human Genome Project and its Applications

UNIT III

Population And Mathematical Genetics -Hardy-Weinberg Principle and its Applications - Factors that alter gene frequency- non-random mating, small populations, selection, Mutations., Migration and gene flow. Consanguinity and its consequences - Genetic Polymorphism - Segregation Analysis - Genetic Linkage - Risk Calculation - Probability Theory - Use of Linked Markers -Bayes's Theorem and Prenatal Screening - Empiric Risks

UNIT IV

Genetics in Medicine: Hemoglobin and the Hemoglobinopathies - Disorders of Hemoglobin – alpha, beta and gamma - Clinical Variation of the Hemoglobinopathies - Antenatal and Newborn Hemoglobinopathy - Disorders of Lipid Metabolism - Disorders Affecting Mitochondrial Function. Prenatal Diagnosis of Inborn Errors of Metabolism

UNIT V

Clinical Genetics: Epigenetics and Cancer - Diabetes - Crohn Disease -Hypertension - Coronary Artery Disease - Schizophrenia - Alzheimer Disease - Hemochromatosis - Venous Thrombosis - Age-Related Macular Degeneration. Recurrent miscarriage - Xeroderma Pigmentosa - X chromosome inactivation - X-linked mental retardation and Fragile X 3 Single-Gene Disorders -Huntington Disease - Hemophilia . Preimplantation Genetic Diagnosis - Non-Invasive Prenatal Diagnosis. Stem Cell Therapy & Ethical and Legal Issues in Medical Genetics.

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SCHOOL OF ARTS AND SCIENCE
DEPARTMENT OF MICROBIOLOGY
B. Sc., MICROBIOLOGY
2022-2023 REGULATION

SEMESTER I					
Course Code	Course Title	L	T	P	C
THEORY					
22110AEC11/ 22111AEC11/ 22132AEC11/ 22135AEC11	Language-I (Tamil-I/ Advanced English-I/ Hindi-I/ French-I	4	0	0	2
22111AEC12	English-I	4	0	0	2
22116AEC13	Fundamentals of Microbiology	6	1	0	5
22115AEC14B	Bio Chemistry I	6	1	0	4
PRACTICAL					
22116AEC15L	Fundamentals of Microbiology Lab	0	0	3	2
22115AEC16BL	Bio Chemistry I Lab	0	0	3	2
Total		22	2	6	17
AUDIT COURSE					
221ACLSICN	Indian Constitution	-	-	-	2
221ACLSUHV	Universal Human Values	-	-	-	2
SEMESTER - II					
Course Code	Course Title	L	T	P	C
THEORY					
22110AEC21/ 22111AEC21/ 22132AEC21/ 22135AEC21	Language-II (Tamil-II/ Advanced English-II / Hindi-II/ French-II)	4	0	0	2
22111AEC22	English-II	4	0	0	2
22116AEC23	Microbial Physiology	6	1	0	5
22115AEC24	Bio Chemistry II	6	1	0	4
PRACTICAL					
22116AEC25L	Microbial Physiology Lab	0	0	3	2
22115AEC26L	Bio Chemistry II Lab	0	0	3	2
RESEARCH SKILL BASED					
Total		19	2	6	19
22116RLC27	Research Led Seminar	-	-	-	1
Total		22	2	6	18
AUDIT COURSES					
221ACLSCOS	Communication Skills	-	-	-	2

221ACSSBBE	Basic Behavioral Etiquette	-	-	-	2
SEMESTER – III					
Course Code	Course Title	L	T	P	C
THEORY					
22110AEC31/ 22111AEC31/ 22132AEC31/ 22135AEC31	Language-III (Tamil-III/ Advanced English-III / Hindi-III/ French-III)	4	0	0	2
22111AEC32	English-III	4	0	0	2
22116AEC33	Immunology	4	1	0	4
22116AEC34	Cell Biology	4	1	0	5
PRACTICAL					
22116AEC35L	Immunology Lab	0	0	3	2
22116AEC36L	Cell Biology Lab	0	0	3	2
RESEARCH SKILL BASED COURSE					
22116RMC37	Research Methodology	2	0	0	2
	Total	18	2	6	19
AUDIT COURSE					
221ACLSOAN	Office Automation	-	-	-	2
SEMESTER – IV					
Course Code	Course Title	L	T	P	C
THEORY					
22110AEC41/ 22111AEC41/ 22132AEC41/ 22135AEC41	Language-IV (Tamil-IV/ Advanced English-IV/ Hindi-IV/ French-IV)	4	0	0	2
22111AEC42	English-IV	4	0	0	2
22116AEC43	Virology	4	1	0	4
22116AEC44	Biostatistics and Bioinformatics	5	1	0	5
221ENSTU45	Environmental studies	2	0	0	2
PRACTICAL					
22116AEC46L	Virology Lab	0	0	3	2
22116AEC47L	Biostatistics and Bioinformatics Lab	0	0	3	2
AUDIT COURSE					
221ACLSLMS	Leadership and Management Skills	-	-	-	2
221ACSSAQA	General Aptitude and Quantitative Ability	-	-	-	2
SEMESTER – V					
Course Code	Course Title	L	T	P	C
THEORY					
22116AEC51	Food and Dairy Microbiology	4	1	0	4
22116AEC52	Molecular Biology	4	1	0	3
22116AEC53	Agricultural and Environmental Microbiology	4	1	0	4

22116DSC54	Discipline Specific Elective -I	4	1	0	3
PRACTICAL					
22116AEC55L	Food and Dairy Microbiology and Molecular Biology Lab	0	0	3	2
22116AEC56L	Agricultural and Environmental Microbiology Lab	0	0	3	2
RESEARCH SKILL BASED					
22116BRC57	Participation in Bounded Research	-	-	-	1
AUDIT COURSE					
221ACLSPSL	Professional Skills	-	-	-	2
	Total	16	4	6	19
SEMESTER – VI					
Course Code	Course Title	L	T	P	C
THEORY					
22116AEC61	Industrial Microbiology	4	1	0	4
22116SEC62	Clinical Microbiology	4	1	0	5
22116DSC63	Discipline Specific Elective - II	4	1	0	3
221—OEC	Open Elective	4	0	0	2
PRACTICAL					
22116AEC64L	Industrial Microbiology Lab	0	0	3	2
22116SEC65L	Clinical Microbiology Lab	0	0	3	2
22116PRW66	Project Work	-	-	-	4
22116PROEE	Program Exit Examination	-	-	-	1
	Total	16	3	6	23
AUDIT COURSE					
221ACSSIST	Interview Skills Training and Mock Test	-	-	-	2
221ACLSCET	Community Engagement	-	-	-	1
Total Credits -Programme					11
Total Credits - Audit Courses					5
Total Credits - Audit Courses					19

Discipline Specific electives

Semester	Discipline Specific Elective Courses-I
V	a) 22116DSC54A - Bioinoculants b) 22116DSC54B - Bioremediation practices c) 22116DSC54C- Advanced immunology d) 22116DSC54D- Genomics and proteomics
	Discipline Specific Elective Courses-I
VI	a) 22116DSC63A - Bioethics b) 22116DSC63B - Biomolecules c) 22116DSC63C - Medical Microbiology d) 22116DSC64D - Bacterial Genetics

Open Electives

Semester	Open Elective Courses
VI	a) 221TNOEC-Tamil Ilakkiya Varalaru b) 221ENOEC-Journalism c) 221MAOEC-Development of Mathematical Skills d) 221PHOEC-Instrumentation e) 221CEOEC-Food and Adulteration f) 221CSOEC - E-Learning g) 221CAOEC-Web Technology h) 221CMOEC-Banking service

Credit Distribution

Sem	AE C	SEC	DSC	OE C	Research	Others	Total
I	17	-	-	-	-	-	17
II	17	-	-	-	1	-	18
III	17	-	-	-	2	-	19
IV	17	-	-	-	-	2	19
V	15	-	3	-	1	-	19
VI	6	7	3	2	4	1	23
Total	89	7	6	2	8	3	115

A. Ximenes
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School of Arts and Science
Department of Microbiology
M. Sc., Syllabus-Regulation 2022

Course Code	Course Title	L	T	P	C
SEMESTER I					
22216SEC11	Prokaryotic Microbiology	6	1	0	5
22216SEC12	Eukaryotic Microbiology	6	1	0	5
22216SEC13	Microbial Physiology	6	1	0	4
22216SEC14L	Fundamentals of Microbiology Lab	0	0	4	2
22216DSC15	Discipline Specific Elective I	5	0	0	4
22216RLC16	Research Led Seminar	-	-	-	1
	Total	23	3	4	21
SEMESTER II					
22216SEC21	Industrial Microbiology	5	1	0	5
22216SEC22	Environmental and Agricultural Microbiology	5	1	0	5
22216SEC23	Clinical Microbiology	5	0	0	4
22216SEC24L	Industrial, Clinical and Environmental and Agricultural Microbiology Lab	0	0	4	2
22216DSC25	Discipline Specific Elective II	5	0	0	4
22216RMC26	Research Methodology	3	0	0	2
22216BRC27	Participation in Bounded Research	-	-	-	2
	Total	23	2	4	24
SEMESTER III					
22216SEC31	Microbial Genetics	6	1	0	6
22216SEC32	Microbial Biotechnology	6	1	0	6
22216SEC33L	Microbial Genetics and Biotechnology Lab	0	0	5	3
22216DSC34	Discipline Specific Elective III	5	0	0	4
222_OEC	Open Elective	4	0	0	4
22216SRC35	Design/Socio technical research	-	-	-	2
	Total	21	2	5	24
SEMESTER IV					
22216SEC41	Pharmaceutical Microbiology	6	1	0	6
22216SEC42	Biostatistics and Bioinformatics	6	1	0	6
22216SEC43L	Pharmaceutical Microbiology Lab	0	0	5	3
22216SEC44	Discipline Specific Elective IV	5	0	0	4
22216PRW45	Project Work	-	-	-	6
22216PEE	Programme exit examinations	-	-	-	2
	Total	17	2	5	27
	Total Credits for the Program				96

Discipline specific Electives

Semester	Discipline specific Elective Courses-I
I	a) 22216DSC15A- Immunotechnology b) 22216DSC15B- Aquatic Microbiology c) 22216DSC15C - Food Technology d) 22216DSC15D - Modern Industrial Biotechnology
	Discipline specific Elective Courses-II
II	a) 22216DSC25A-Clinical research and development b) 22216 DSC25B- Soil and Water Engineering c) 22216 DSC25C -Fungal Immunology d) 22216 DSC25D -Pollution Research
	Discipline specific Elective Courses-III
III	a) 22216DSC34A-Microalgal Technology b) 22216DSC34B-Drug Development Product Management c) 22216DSC34C -Biomolecules and Polymers d) 22216DSC34D -Nanotechnology
	Discipline specific Elective Courses-IV
IV	a) 22216DSC44A-Molecular Immunology b) 22216DSC44B-Metabolic Engineering of Bacteria c) 22216DSC44C - Toxicology d) 22216DSC44D -Biomedical Science

Open Electives

Semester	Open Elective Courses
III	a) 222ENOEC-Writing for the media b) 222MAOEC-Applicable Mathematics Techniques c) 222PHOEC-Bio-Medical Instrumentation d) 222CHOEC-Green Chemistry e) 222CSOEC - M-Marketing f) 222CMOEC- Financial Services

Credit Distribution:

Sem	SEC	DSC	GEC	RSB courses	Others	Total
I	16	4	-	1	-	21
II	16	4	-	4	-	24
III	15	4	3	2	-	24
IV	15	4	-	6	2	27
Total	62	16	3	13	02	96

A. Kumari
HOD

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SCHOOL OF ARTS AND SCIENCE

DEPARTMENT OF MICROBIOLOGY

Value added course

ACADEMIC YEAR 2022-2023

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SCHOOL OF ARTS AND SCIENCE

DEPARTMENT OF MICROBIOLOGY

Certificate Course in Advanced Techniques in Clinical Microbiology

ACADEMIC YEAR 2022-2023

Subject Code: 22516ATCM

Total: 45 hours

Course objectives:

To learn the basic and advanced techniques in a clinical Laboratory.

Course Outcomes

At the end of this course, students will be able to, Understand laboratory safety methods. Understand pathological analysis of clinical specimens. Gain knowledge about automated techniques in Clinical Laboratory Technology.

Unit I Laboratory Safety (9Hr)

Organization of laboratory and safety precautions in laboratory – Personal hygiene and care – General health care – Vaccination Schedule for technicians – Laboratory care and cautions – Do's and Don't's – lab accidents – Cuts and wounds – Fire Accidents (Chemical Gas, Flammable Chemicals, Electrical , Spirit Lamp, Gas) – Chemical burns.

Unit II Sample Analysis (9Hr)

Sample collection, processing, preservation and transportation of various clinical pathology samples. Pathological Analysis of clinical specimens.

Unit III Microscopic Analysis (9Hr)

Microscopic analysis of clinical specimens – Urine, Stool, Sputum, Pus, Blood, CSF and other body fluids.

Unit IV Culture Methods(9Hr)


Culture methods – Culturing and isolation of pathogens from clinical specimens: Culture media – General purpose media – special media – selective media – differential media – transport media. Department of Microbiology Faculty of Science 87

Unit V Advanced Techniques & Automation (9Hr)

ELISA – PCR- Fluorescence Microscopy – Automated culture systems – automated Blood culture – Automated Urine culture – Automated Antibiotic Sensitivity testing.

Text Books:

1. Anantha narayanan. R. and Paniker C. K. J. TextBook of Microbiology, 9th Edition Orient Longman, 2013.
2. Chakraborty, A TextBook of Microbiology 3rd Edn, New Central book Agency (P) Ltd, Kolkata, India, 2005.
3. James cappuccino, Natalie Sherman. Microbiology A Laboratory manual. 7th Edition. 2004. Praful Godkar, Darsan, Text book of Medical Laboratory Technology Vol I & II, Bhalani Publishing House. 2014.


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SCHOOL OF ARTS AND SCIENCE
DEPARTMENT OF MICROBIOLOGY
CERTIFICATE COURSE ON FOOD PROCESSING
ACADEMIC YEAR 2022-2023

Syllabus

Subject Code: 22516FP

Value added course: 1

Total: 45 hours

AIM:

The aim of food processing makes food more edible, palatable and safe, and preserves it so it can be eaten beyond the harvest season. Food processing is also a tool that offers greater variety in foods and therefore increases the consumer's choice.

Course Objectives:

- CO 1: To get the knowledge about the principles and methods of preservation
- CO 2: To know about the freezing and thawing process.
- CO3: To know about food Drying/Dehydration
- CO4: To get the knowledge of Food Concentration
- CO 5: To know about the Membrane Processing

Course Outcome:

- CO1: Students will understand the basic concepts in food processing and will get knowledge
- CO2: They will understand different freezing methods used in food processing.
- CO3: They will understand the drying methods and types of dryers.
- CO4: They will understand different Food Concentration methods used in food processing
- CO5: They will learn different Membrane Processing.

UNIT 1 (9Hr)

Food processing and preservation principles, method of preservation: pasteurization (definition, time-temperature combination and equipments) sterilization (definition, time-temperature combination and equipments), blanching (definition, time-temperature combination and equipments, adequacy in blanching), canning (definition, time-temperature combination and equipments), packaging (Introduction, Metal Containers, Glass Containers, Rigid Plastic Containers, Retortable Pouches).

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UNIT 2 (9Hr)

Food Freezing and thawing process: Introduction, freezing point and freezing rate, comparison of Freezing and thawing process; freezing methods: Air freezing, plate freezing, liquid immersion freezing and cryogenic freezing. Freezer selection. Advantages and disadvantages of freezing. Freezing curve. Freezer selection, advantages and disadvantages of freezing and changes in food during freezing storage.

UNIT 3 (9Hr)

Food Drying/Dehydration: Definition, free and bound moisture, concept of water activity, factors affecting drying, Drying curve (constant rate period and falling rate period), moisture content (wet basis and dry basis), equilibrium moisture content, Drying methods and equipments: sun/solar drying, Cabinet drying, tunnel dryer, spray dryer, freeze dryer, fluidized bed dryer, Nutritional, physico-chemical changes during drying

UNIT 4 (9Hr)

Food Concentration: Evaporation- Definition, types of evaporator (single effect, double effect and multiple effect evaporator); Freeze concentration- General principles and applications, basic elements, ice crystal nucleation, growth and crystallization, separation techniques (filtration and wash column).

UNIT 5 (9Hr)

Membrane Processing: General principles and advantages, dead end and cross flow, Classification of membrane system: Reverse Osmosis, Nano Filtration, Ultra Filtration, Micro Filtration, Electrodialysis and Pervaporation; Membrane technology comparison chart, Membrane application in the food industries; Membrane performance, and Limitation of membrane processes.

TEXT BOOKS/ REFERENCES:

1. Food Processing: Principles and Applications by Ramaswamy H. & Marcotte M. Taylor & Francis.
2. Food Science by Norman N Potter and Joseph H. Hotchkiss, CBS Publishers and Distributors.
3. Novel Food Processing Technologies by Barbosa-Canovas, Tapia & Cano CRC Press; 2004.


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PONNAIYAH RAMAJAYAM INSTITUTE OF SCIENCE AND TECHNOLOGY (PRIST)
PRIST Deemed to be University
School of Education
Department of Education

Minutes of the meeting of the Board of Studies (BoS)*

Date: 09 .05. 2022

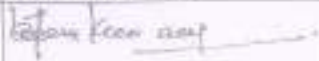
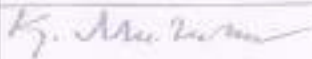
Venue: Silver Jubilee Seminar Hall, First floor (CRD)

Time: 11.00 am


Members present:

Chairman: Dr.R.Gunasekaran
M.Sc , M.Ed, M. Phil, Ph.D.,
Head & Professor
School of Education
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External Members






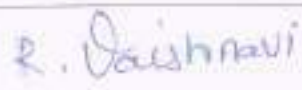

S.No.	Name/Degree/Designation	Institute/Organization/ Full address	Online/ Physical	Signature (scan, if online)
1	Dr. N.Sasikumar M.Sc ,M.Ed, M.Phil.,Ph.D Associate Professor, Head, Department of Education, Alagappa University, Karaikudi	Head, Department of Education, Alagappa University, Karaikudi	Physical	 Dr. N. SASIKUMAR, M.Sc, M.Sc(Psy), M.Ed, M.Phil, Ph.D Assistant Professor Department of Education Alagappa University Karaikudi - 630 003
2	Dr.K. Muthusamy M.Com, M.Ed, M.Phil, Ph.D., Principal, Annai Fathima College of Education, Kumbakonam	Principal, Annai Fathima College of Education, Kumbakonam.	Physical	 Dr. K. MUTHUSAMY, M.Sc, Ph.D, M.Ed, M.Phil, Ph.D, PRINCIPAL, ANNAI FATHIMA COLLEGE OF EDUCATOR, SIVLACHIN, KUMBAKONAM-612001

Internal Members


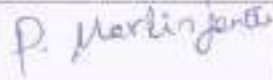
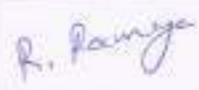
S.No.	Name/Degree/Designation	Department	Online/ Physical	Signature (scan, if online)
1	Dr.R.Gunasekaran M.Sc , M.Ed, M. Phil, Ph.D., Head & Professor	Department of Education	Physical	 09.05.2022

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2	Dr.P.Rajasekar M.A , M.Ed,M. Phil, Ph.D.,Professor	Department of Education	Physical	
3	Dr.K.B.Jasmine SuthandiraDevi M.A , M.Ed,M. Phil, Ph.D.,Professor	Department of Education	Physical	
4	Dr.M.Balasubramanian M.A , M.Ed,M. Phil, Ph.D.,Associate Professor	Department of Education	Physical	
5	Dr.M.Aron Antony CharlesM.Sc , M.Ed,M. Phil, Ph.D., Associate Professor	Department of Education	Physical	
6	Dr.S.Selvaraj M.A,M.Ed, M.Phil, Ph.D., Assistant Professor	Department of Education	Physical	
7	Mrs.R.Vaishnavi M.A.M.Ed , M. Phil, Assistant Professor	Department of Education	Physical	
8	T.Selvaraj M.Sc ,M.Ed, M. Phil, Assistant Professor	Department of Education	Physical	

Invited Participants

S.No.	Name/Degree/Designation	Department/Class Institute/Organization/Address	Online/ Physical	Signature (scan, if online)
1	Dr.Chinnappa M.Sc,M.Ed.,M.Phil,Ph.D.,PCIDCA Dean, School of Arts and Science, PRIST Deemed to be University, Thanjavur	Dean, School of Arts andScience, PRIST DEEMED TO BE UNIVERSITY, Thanjavur	Physical	
2	P. Merlin Jenita M.A.,B.Ed., II - M.Ed Student Teacher,Pomniya Ramajayam CBSC Public School, Thanjavur.	PRIST DEEMED TO BE UNIVERSITY, Thanjavur	Physical	
3	R.Ranya B.Sc II - B.Ed Student	PRIST DEEMED TO BE UNIVERSITY, Thanjavur	Physical	

Agenda

1. Confirmation of the previous Meeting Minutes
2. Action taken on the previous Meeting Minutes
3. To scrutinize the stakeholder feedback on B.Ed. and M.Ed. curriculum

4. To consider about inclusion of syllabus in Pedagogy subjects based upon the Tamil nadu Text book society
5. To consider the introduction of employment oriented add on courses
6. To consider the introduction to new course.
7. To consider the introduction to value added course.
8. To recommend the panel of examiners for B.Ed. & M.Ed.
9. Any other matter

SCHOOL OF EDUCATION
Department of Education
Minutes of the Board of Studies

The Board of Studies meeting was held on 09.05.2022. The Chairman Dr.R.Gunasekaran Welcomed the members to Board of studies and outlined the changes to be made in the following for the board approval.

Item 1. To consider change in the Curriculum, Scheme of Examination and Syllabi of B.Ed & M.Ed course and approval.

Item 2. To suggest the panel of names for appointment of examiners.

Item 3. Other academic activities in the department.


As per the suggestions and recommendations given by the Stakeholders on the above items discussed, the existing/revised Scheme of Curriculum/Scheme of Examination syllabi and Panel of Examiners are to be followed is annexed herewith for the implementation from the commencement of the Academic year 2021-2022.

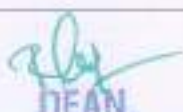
The members after careful scrutiny of the changes to be made unanimously accorded approval for the proposed changes/modifications. They also resolved to authorize the Chairman of Board of Studies to place the changes/modifications now approved by the BOS before the Standing Committee on Academic affairs and Academic Council.

The Regulations and Syllabus for B.Ed. and M.Ed. Courses were discussed in the BOS.

Agendum 1: Confirmation of the previous Meeting Minutes	
Discussion: The minutes of the 7 th Board of Studies meeting held on 13 th July 2021 were communicated to the members. The comments received have been incorporated and placed for confirmation. The same was approved by the 7 th Academic council.	
Resolution: Resolution: The coordinator read the minutes of earlier meeting and the minutes were Reviewed and passed by the members.	
Agendum 2: Action taken on the previous Meeting Minutes	
Discussion: The details of the action taken were presented to the members	
Resolution: The members expressed satisfaction over the action taken	
Agendum 3: To scrutinize the stakeholder feedback on B.Ed and M.Ed curriculum	
Discussion	<ol style="list-style-type: none"> 1. Introducing the changes of new trends of curriculum in the pedagogy subjects 2. More appropriate topics should be added for M.Ed. curriculum based upon the recent trends 3. For B.Ed. and M.Ed. regular TET and TRB coaching hours should be added 4. To introduce the Psychology practical record in the curriculum for M.Ed.
Resolution	The board unanimously resolved to make necessary changes as requested by the stake holders

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Agendum 4: To consider about inclusion of syllabus in Pedagogy subjects based upon the Tamilnadu Text book society
Discussion The Tamil nadu text book society changed the school syllabus frequently so B.Ed. pedagogy curriculum syllabus also modify based upon the resent trends
Resolution The members of the board resolved to approve the modified syllabus of the pedagogy subjects in the B.Ed. curriculum
Agendum 5: To consider the introduction of employment oriented add on courses.
Discussion The existing syllabus gives enough opportunity for employability and there was no urgent need to introduce new add on courses. Also it was pointed out that, the syllabus should be revised compulsorily next year based upon the new education policy
Resolution: Resolved to introduce some more employment oriented add on courses in the next BOS meeting
Agendum 6: To consider the introduction to new course
Discussion The board members give syllabus new course for B.Ed : Childhood and Growing up, Value and Peace Education, Teaching and Learning, Pre - Primary Education, Disaster Management, Professional Course for Teacher Proficiency, Strengthening Language Proficiency, Gender Issues in Education, Understanding the self, Addressing Special needs in Classroom M.Ed new course: Early Child Care and Education, Inclusive Education, Pre - Service and In-service Teacher Education, Sociology of Education, Educational Measurement and Evaluation, Educational Studies, Comparative Education, ICT on Teaching and Learning, Crucial Understanding of ICT and Cyber Security.
Resolution: Resolved to introduce new course in the next BOS meeting
Agendum 7: To consider the introduction to value added course
Discussion The existing syllabus gives enough name of the Value added course Educational and Socialization, NCC, Health and Well-Being, Modern Pedagogical Techniques, Technical Writing.
Resolution: Resolved to introduce some more employment oriented Value added courses in the next BOS meeting
Agendum 8: To recommend the panel of examiners for B.Ed. & M.Ed.
Discussion Members suggested the names of the experts who would serve as panel of examiners for B.Ed. and M.Ed. Programme
Resolution: The BOS approved a tentative list of subject experts for paper setting, moderation and Examiners. If required few more experts may be included with the permission of the Concerned authorities.
Agendum 9: Review Of Curriculum & Syllabus In B.Ed-Regulation - 2022



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Discussion

- To discuss the modifications in the syllabi for First and Second Year curriculum
- As such, the curriculum is revisited and certain sweeping changes have been made – by introducing new courses and improvising the syllabi of many courses. The honorable members Board of Studies have expressed their appreciations for the changes made commenting that they address the current demands of the education Profession.

Resolution:

Resolved to Improvements in Course Contents of the following paper B.Ed (B.Ed. I,II,III and IV semester)I - Semester

Group – A: Perspectives in Education

	Course Code	Course Title	Revision
Group – B: Curriculum	22130PE11	Psychology of Learners and	I - semester
	22130PE12	Learning Assessment for Learning	I - semester
	22130CP13A	And Pedagogic studies	
	22130CP13A	Pedagogy of Tamil: Part - I	I - semester
	22130CP13B	Pedagogy of English: Part - I	I - semester
	22130CP13C	Pedagogy of Mathematics: Part - I	I - semester
	22130CP13D	Pedagogy of Physical Science: Part - I	I - semester
	22130CP13E	Pedagogy of Biological Science: Part - I	I - semester
	22130CP13F	Pedagogy of Computer Science: Part - I	I - semester
	22130CP13G	Pedagogy of Social Science: Part - I	I - semester
	22130CP13H	Pedagogy of Commerce and Accountancy : Part - I	I - semester
	22130CP13I	Pedagogy of Economics: Part - I	I - semester
	22130CP13J	Pedagogy of History: Part - I	I - semester
22130CP13K	Pedagogy of Geography: Part - I	I - semester	
		II - Semester	
S.NO.	Course Code	Course Title	Revision
Group –A	Perspectives in Education		
	22130PE21	Contemporary India and Education	II - semester
	22130PE22	Teaching and Learning	II - semester
Group – B:	Curriculum and Pedagogic studies		
	22130CP23A	Pedagogy of Tamil: Part – II	II - semester



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	22130CP23B	Pedagogy of English: Part - II	II - semester
	22130CP23C	Pedagogy of Mathematics: Part - II	II - semester
	22130CP23D	Pedagogy of Physical Science: Part - II	II - semester
	22130CP23E	Pedagogy of Biological Science: Part - II	II - semester
	22130CP23F	Pedagogy of Computer Science: Part - II	II - semester
	22130CP23G	Pedagogy of Social Science: Part - II	II - semester
	22130CP23H	Pedagogy of Commerce and Accountancy : Part - II	II - semester
	22130CP23I	Pedagogy of Economics: Part - II	II - semester
	22130CP23J	Pedagogy of History: Part - II	II - semester
		III - Semester	
Group -A	Perspectives in	Education	Revision
	22130PE31	Knowledge and Curriculum	III - semester
		IV - Semester	
Group -A	Perspectives in	Education	
	22130PE43	Language across the Curriculum	IV - semester
<u>Review Of Curriculum & Syllabus In M.Ed - Regulation 2022</u>			
Resolved to introduce the following Courses in the M.Ed programme curriculum with effect from 2022-23			
	Course Code	Course Title	Revision
	22230TE14	Teacher Education In India Elementary & Secondary Level	
	22230SC15A	Early Child Care and Education	
		II - Semester	
	22230PC21	Philosophy of Education	

22230SC25B Pre-service and In-service Teacher Education
III - Semester

22230PC31 Sociology of Education

22230TC33 Educational Measurement and Evaluation
IV - Semester

22230PC41 Educational Studies

22230PC42 Comparative Education

22230TC43 ICT on Teaching and Learning
ONLINE COURSE (CHOICE BASED)

MOOC SWAYAM -I Course (Not less than 4 weeks)

Signature:



Chair/HoD:

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Department of Education

Name: *Dr. M. Aron Antony Charles*

Date: *09.05.22*

Mandatory Attachments:

1. Minutes of the previous BoS meeting minutes and report on the follow-up action taken.
2. BoS Meeting 'Notification' sent to all members, including online meeting link.
3. Online Screenshots and geo-tagged photos in the venue.
4. Attendance sheet print of online attendees.
5. Detailed syllabi with PEOs, POs, COs, etc. (in Annexures), if new Programme(s) introduction /Curriculum revision is discussed.

Note: The 'minutes' of the BoS meeting along with the attachments as listed above must be mailed to the Registrar by the HoD within three days after the meeting, copying Dean concerned, Dean - Academic Affairs and the VC's office.


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Signature:



Dean:

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Name: *Dr. R. GUNASEKARAN*

Date: *09-05-2022*


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PRIST DEEMED TO BE UNIVERSITY
SCHOOL OF EDUCATION
VALUE ADDED COURSE
Course code: 22130VAC1 - Education and Socialization

Objectives:

- To enable the teacher trainees undertake action research to solve their professional problems.
- To reduce the gap between theory and practice, teacher and education curriculum and school realities.
- The course (B.Ed.,) will provide adequate theoretical orientation regarding the objectives of education in the Indian Background.

Unit - I : Introduction : Conceptual clarity, Relationship between society, Education and Development.

Unit - II : Socialization and Education : Relations between socialization and Education, Agencies of socialization and Education: Family, Peer Groups, School and Meida

Unit - III : Education, Inequalities and Social Justice: Concept of Equality of Educational Opportunity, Education and Disparities: Caste, Class, tribe, gender, rural-urban, Education and social mobility

Unit - IV : Emerging Trends in Education in India: School education: Existing scenario, Higher Education in India. Governance of Higher Education: Institutional programmes, National Educational policy 1986.

Outcomes:

- Applying teaching skills and dealing with classroom problems
- Evolving a system of education which enhances the potential of every learner to acquire, retain and transform knowledge leading to wisdom society through creative, experiential and joyful modes of learning.
- Transform the educational landscape by providing open access to quality, value based and socially relevant education to all by harnessing the disruptive potential of AI.
- Analysis of Curriculum, construction of blue print, selecting appropriate teaching strategies according to needs of students and conducting action research to solve classroom problems.

Reference book:

- Roberta Bemis: Wadsworth Publishing Co Inc; 8th ed. edition (26 January 2009); CBS Publishers & Distributors Pvt. Ltd -PH: 011-49344934 ISBN-13 : 978-0495603252
- Grusec, J.E., Lytton, H. (1988). Socialization and the Family. In: SocialDevelopment. Springer, New York, NY. https://doi.org/10.1007/978-1-4612-3768-6_5
- Psychology Press Ltd; 1st edition (28 November 2012) SBN-13 : 978-0415651769


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PRIST DEEMED TO BE UNIVERSITY
SCHOOL OF EDUCATION
VALUE ADDED COURSE
Course code: 22130VAC2 - NCC

Objectives:

- To enable the teacher trainees undertake action research to solve their professional problems.
- To reduce the gap between theory and practice, teacher and education curriculum and school realities.
- The course (B.Ed.) will provide adequate theoretical orientation regarding the objectives of education in the Indian Background.
- National Integration: Importance and Necessity

UNIT-I: The NCC

Aim and Objectives of NCC – Organization and Trainings and NCC Song

Incentives – National integration and Awareness- National Integration: Importance and Necessity.

Freedom Struggle and Nationalist Movement in India

UNIT- II: Drill, Weapon Training

Characteristics of a rifle and its ammunition- Stripping, assembling, care and cleaning of 22 Rifle

Loading, cocking and unloading-Different positions for holding and aiming

UNIT- III: Personality Development and Leadership

Introduction to Personality development-Communication skills - Leadership traits-Time

management- Disaster Management and Civil Affairs-types of Emergencies and Nature (Disasters-

Assistance during natural and other calamities:Floods,Cyclones, Earth quakes, Accidents.

UNIT- IV: Social Awareness Community Development-Basics of Social Service and its needs

Contribution of youth towards social welfare-Civic responsibilities- Health and Hygiene

Hygiene and sanitation-Infectious and contagious diseases and its prevention.

UNIT- V: Adventure and Obstacle Training-Obstacle training: Environment Awareness and

Conservation-Natural resources-conservation and management-Water conservation and rain water

Harvesting.

Outcomes:

- Transform the educational landscape by providing open access to quality, value based and socially relevant education to all by harnessing the disruptive potential of AI.
- Analysis of Curriculum, construction of blue print, selecting appropriate teaching strategies according to needs of students and conducting action research to solve classroom problems.

Reference book: Mindset (Carol S. Dweck, 2017): A liberating way to approach life, as per which everything great is work in progress. A must-read and the book I have gifted most often. Read here for more: Winning (Jack Welch, 2005): Probably the best book on leadership out there. Great advice which I keep on referring to regularly. Often while facing a difficult situation at work I am reminded of some of the learnings: "Don't run for office. You are already elected.", or how Candor is the biggest dirty little secret in education.

Good to Great (Jim Collins, 2001): One of the most popular business books. Concepts introduced in this book like Level 5 leadership, Stockdale's paradox, Flywheel & Hedgehodge concept have become almost legendary.

Shoe Dog (Phil Knight, 2016): An adrenalin-pumping story of how Nike was built. If you are not into non-fiction and would like to start somewhere, this could be the perfect start!

Hit Refresh (Satya Nadella, 2017): A great read on leadership, empathy, and how to drive change. Learn how to transform an organization and a bit about partnerships and technology.


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**PRIST DEEMED TO BE UNIVERSITY
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VALUE ADDED COURSE**

Course code: 22130VAC3 – Health and Well-Being

Objectives:

- To introduce the learners to the concept of health and wellness and its solely
- To introduce the learners to the concept to health and wellness and its relevance in daily life.
- To introduce the learners to the relation between mind-body and its relevance.
- To introduce learners to health behavior and promotion of human strengths for well-being evince daily life.
- To introduce the learners to the relation between mind-body and its relevance.

UNIT-I: INTRODUCTION TO HEALTH & WELLNESS

Definition of health-WHO definition-Importance of health in everyday life-Components of health-physical, social,mental,spiritual and its relevance Concept of wellness-Mental Health & wellness-Determinants of health behaviors-Using the mass media for health promotion

UNIT-II: Mind-Body connection in health-concept and relation-Implications of mind-ode connections. Well being-Digital wellbeing-Understanding health beliefs, and perspectives of in digamous people pertaining to Assam and North Estonia Promoting Human strengths and life enhancement Classification of human strengths and virtues; cultivating inner strengths: Hope and optimism

UNIT-III: Science of Wellbeing is an evolving science with contributions from multiple disciplines including Psychology , Sociology , Health & Physical Education , Nutrition , Environmental Science and Finance. With the distinct knowledge base of social and behavioral science at its core , it began as a branch of social science and has since evolved. The term Wellbeing encompasses Holistic Health and Happiness, in addition to positive functioning of physical , emotional and social domains.

UNIT-IV: In modern world, " Wellbeing " is referred as stress free living and happiness in terms of positive psychological interventions, good physical functioning in terms of health, nutrition and physical education as well as financial security in terms of commercial studies.

UNIT-V: The subject being offered at the Higher Secondary level under the West Bengal Council of Higher Secondary Education provides the scope for the students to choose higher education and vocation at degree course involving Psychology , Physical Education , Sociology and Nutrition for career opportunities as Psychologist , Motivational speaker , Wellbeing Counselor , Physical educator and Yoga Therapist , Nutritionist and Diet Therapist etc.

LEARNEROUTCOMES:

- After completion of this course the learner will be able to:
- Explain the concept and nature of health, wellness and it various implications
- Dementia trade quite knowledge on well-being and promotion of healthy behavior..

REFERENCE BOOK

1. Carr, A. (2004). *Positive Psychology:Thescience of happiness and humanstrength*. UK: Routledge.
2. Forshaw,M.(2003). *Advancedpsychology: Healthpsychology*. London: Hodderand Stoughton.
3. Hick, J.W. (2005). *Fifty signs of Mental Health. A Guide to understanding mental health*. Yale University Press.
4. Snyder,C.R. & Lopez,S.J.(2007). *Positivepsychology: Thescientificandpractical explorations of human strengths*. Thousand Oaks, CA: Sage.


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**PRIST DEEMED TO BE UNIVERSITY
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VALUE ADDED COURSE**

Course code: 22130VAC4 – Modern Pedagogical Techniques

Objectives:

- Explain the concept of group analysis, Brain storming, Micro teaching ,different types of techniques, programmed, inquired, co-operative learning and mind mapping with illustration
- Describe the innovative medias involved in teaching and learning process such as M- Learning and E-Learning in the class room
- Familiar with online Learning Tools which are used to connect the learners to teach them.

UNIT – 1 – Innovative Techniques

Group analysis: Meaning - Methods – Brain Storming: Meaning - Methods - Micro Teaching Technique: Meaning - Characteristics - Procedure - Phases -Principles - Teaching Skills -Set induction - Reinforcement - Probing Questions - Stimulus Variation - Closure - Black Board Skills - Advantages - Disadvantages.

UNIT – 2 – Individualised Instructions

Programmed Learning - Concept - Characteristics - Principles - Styles of Program -InquiryBasedLearning - Concept - Characteristics - Misconception - Criticism - Mind Map - Concept - Characteristics - Examples.

UNIT – 3 – Educational Approaches

Cooperative Learning - Meaning -Techniques - Benefits - Dramatization - Meaning - Importance - Types - Advantages - Limitations -Gamification - Meaning - Techniques - Design – Applications.

UNIT – 4 – Audio-Visual Aids

Need for Audio Visual Aids - Role of Audio Visual Aids - Purpose - Print Resources - Newspaper - Magazines - Journal - Encyclopaedia - Audio Resources – DVDs - CD - Visual Resources - Pictures - Flash card - Charts- Posters – Photographs- Models - ICT Resources - Television – Internet- Multimedea.

UNIT – 5 – Interactive Electronic Whiteboard

Highlights - Features - General operation and use - Classroom uses - Benefits - Criticisms

Outcomes:

practice the group analysis, Brain storming and Micro teaching and understanding the application of mind mapping and obtaining knowledge in programmed, cooperative and inquiry based learning

Apply of the innovative medias involved in teaching and learning process such as M- Learning and E-Learning can be practiced in the class room

Reference book:

- Denning,P.J and Tedre,M. (2019) Computational Thinking, The MIT Press.
- Flatley, Joseph .L (2011) Augumented reality at the Allard Pearson Museum in Netherland.
- Higgins,s.,Xiao.Z, (2012) The impact of Digital Technology on learning: A summary for the Education Endowment Foundation, London.
- Rajasekar,S. and Raja Ganesan,D.(2013) Methods of Teaching of ComputerScience,Hyderebad: Neeikamal Publications PVT Ltd.


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PRIST DEEMED TO BE UNIVERSITY
DEPARTMENT OF EDUCATION
B.Ed. SYLLABUS, 1st YEAR SEMESTER - I
ENHANCING PROFESSIONAL CAPABILITIES /
ELECTIVE - GUIDANCE AND COUNSELLING
COURSE CODE: 22130EP14B

COURSE OBJECTIVES:

The student teacher will be able to:

- CO1: list out the principles underlying guidance
- CO2: elucidate the need of guidance and counselling in schools
- CO3: describe the different services in the school guidance programme
- CO4: understand the various therapies in counselling
- CO5: acquire the skills necessary to administer and interpret standardized tools

UNIT I: GUIDANCE

Guidance- Meaning, Definitions, Aims, Nature, Principles and Needs. Types- Educational, Vocational, Personal, Social- History of guidance movement in India- Problems of guidance movement- ways to improve guidance services in India - Benefits- Limitations. **Guidance Movement in India**. Therapies in Counselling: Psycho- behavioral therapy, Psycho - analytic therapy, Gestalt therapy – Stress and stress management, History of guidance movement in India – Problems of guidance movement in India – Ways to improve guidance movement in India.

UNIT II: COUNSELLING

Counselling- Meaning, Definitions, Elements-Characteristics – Objectives – Need – Types: Directive Counselling, Non-Directive Counselling, Eclectic Counselling – Meaning, Characteristics, Steps, Advantages, Limitations – Difference between Counselling and Guidance. **Qualities of a Counsellor** Counsellor – Qualities – Functions- Professional Ethics- Role of Teacher as counselor

UNIT III: GROUP GUIDANCE AND GROUP COUNSELLING

Group guidance – Meaning, Definition, Objectives, Problems, Significance – Techniques, Uses. Group counselling – Meaning, Requirements - Uses. **Theories of Vocational Choice** – Ginzberg, Super, Holland, Havighurst, Structural theory.

UNIT IV: TESTING DEVICES IN GUIDANCE

Testing devices in guidance: Meaning, Definition, Measurement, Uses of psychological tests: Intelligence tests – Aptitude tests- Personality Inventories- Attitude scales – Achievement tests – Creativity tests -Mental health – frustration conflict. **Non –Testing Devices in Guidance** Non-testing devices in guidance: Observation – Cumulative record, Anecdotal record, Case study , Autobiography, Rating Scale, Sociometry etc.

UNIT V: GUIDANCE SERVICES IN SCHOOLS

Guidance services at different school levels-Meaning, Significance, Types – Organisation of Guidance services in schools – Role of guidance personnel – Career and Occupational Information – sources, gathering, filing, dissemination- Career Corner- Career Conference- Career exhibitions. Good practices in Tamilnadu - Mobile Counselling centres - State Resource center for counselling children with disability. **Guidance for Exceptional Children** – Meaning, and Types. Guidance for gifted, backward, mentally retarded, orthopedically handicapped, visually impaired, deaf and dumb, juvenile delinquents-guidance for dropouts- Socially disadvantaged children - Alcoholics, Addicts - Sexual harassment-Eve teasing- Gender discrimination - Exemptions in examination for exceptional children.

SESSIONAL ACTIVITIES:

- Observe and inquire the process of learning by children from different backgrounds and record your observations.
- Visit any two Special Education Institutions and write a report on the methods of teaching.

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B.Ed. SYLLABUS – 1st YEAR SEMESTER – I
ENHANCING PROFESSIONAL CAPABILITIES /ELECTIVE
EDUCATIONAL ADMINISTRATION AND MANAGEMENT
COURSE CODE: 22130EP14C

COURSE OBJECTIVES:

The student teacher will be able to:

CO1: acquire knowledge of the terms used in educational administration and management

CO2: understand the role of head master and his/her duties

CO3: develop the mode of inspection and supervision of function

CO4: know the role of teacher in decision making

CO5: develop interest in the educational administration and management techniques

UNIT I - EDUCATIONAL ORGANIZATION

Principles or criteria -Organizational structures - Administrative structures at Central and State levels.

UNIT II- ESSENTIAL FACETS OF ADMINISTRATION

Headmaster and Teacher's duties and responsibilities, Role of the Head master – Parent Teacher Association-Time-Table- Co-curricular activities - Discipline- Student evaluation.

UNIT III - INSPECTION AND SUPERVISION

Aims, Meaning, Modern concepts - Types of Inspection and Supervision - Functions and duties of inspector and supervisor.

UNIT IV- DECISION MAKING IN ADMINISTRATION

Meaning - Importance - Process - Decision making techniques - Teachers' role in decision making- Involvement of pupils in decision making.

UNIT V - MANAGEMENT

Meaning-Definition -Objectives of Management -Role of Management -Difference between Administration and Management- Functions of Management –PODSCORB (Planning, Organization, Direction, Staffing ,Co-ordination, Reporting, Budgeting) - Modern Functions: Planning ,Organizing ,Leading ,Controlling-Management skills: Conceptual skills, Human skills, Technical skills.

SESSIONAL ACTIVITIES:

- A study of any one N.G.O (Non Government Organization) promoting education. (Study includes the objectives, functions, problems & contribution to education.)
- Yogic Practices for healthy living - some select yogic practices:Asanas, Bandha, Kriyas and Pranayama - Supine position, prone position, sitting position, standing position.
- Write and display of Education related quotes in your institution.
- Prepare an album about the best practices of various schools.
- Organize an Essay Writing Competition for protecting and safeguarding our Eco – System and submit a write up on it.
- Prepare a detailed report on the code of conduct observed by the teachers in schools

REFERENCES:

- Chakraborty, A. K. (2004). Principle & practice of education. Meerut: R.Lall Books Depot NIEP A.
- Chaupe, S. P . (2008). Foundations of education. UP: Vikas Publishing House Pvt Ltd
- Chaupe, S. P ., & Chaupe, A. (2008). School organisation. New Delhi: Vikas Publishing House.
- Gangadhar, R. M., & Rao, V . P . S. (2000). Organizational behaviour . Delhi: Konark Publishers Pvt. Ltd.

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B.Ed. SYLLABUS – 1st YEAR SEMESTER – I
ENHANCING PROFESSIONAL CAPABILITIES /ELECTIVE
PRE –PRIMARY EDUCATION
COURSE CODE: 22130EP14D

COURSE OBJECTIVES:

The student teacher will be able to:

CO1: gain the knowledge of the development of Pre-Primary education

CO2: acquaint with the policy perspectives of ECCE in India and world

CO3: systematize experiences and strengthen the professional competencies of pre-school Teachers.

CO4: organize meaningful learning experiences for pre-school children

CO5: develop skills required in selecting and organizing learning experiences

UNIT I: HISTORICAL APPROACH

Contribution of great educators to the development of child education: Comenius, Rouseau Pestalozzi, Froebel, Montessori, Dewey, Tagore and Gandhiji Development of Pre – Primary and Primary Education in India – Brief survey of Ancient India : Moghal, British period and Independent India Implications for Pre – Primary and Primary Education in our country – Reports of different Education commissions – Particularly the secondary education commission, the Kothari commission of 1964-66 and the new policy of education, 1986 – Development of Pre – Primary and Primary Education under the five year plans – the place of Pre- School and Primary education in the 10+2+3 pattern of education.

UNIT II: ECCE: POLICY AND PERSPECTIVES

Concept, significance and objectives of ECCE. ECCE in India: Policies and programs in national policy on Education (NPE, 1986) and POA (1992), National plan of action for children, 1992 and 2005 National curriculum framework (2005). ECCE in Global perspectives: United Nations convention on Rights of the child (UNCRC, 1989), Millenium Development Goals (2000) and Global monitoring report (UNESCO) 2007 – concerns and issues.

UNIT III: THE DEVELOPMENT OF CHILDREN

Aspects of Child Development: Physical including sensory motor development, intellectual including concept formation, language development, emotional and social - Development tasks up to late childhood: growth norms and their implications for education. Needs of normal and exceptional children biological, psychological, socio- cultural, health and nutritional needs - Needs as motives for child learning.


UNIT IV: PRE-PRIMARY EDUCATION

Principles involved in planning the programme of activities with reference to the aims and objectives of this stage - Basic schedule of activities - Planning and implementation, factors influencing planning - Importance of personal hygiene and environmental sanitation in the programme - Technique of developmental activities: Play , storytelling, language games, number work, creative work and activities for self-expression, group and individuals activities. Role of ICDS - Functions of Anganwadi.

UNIT V: STRATEGIES / APPROACHES AND RESOURCES

Characteristics of programmes for different settings – Pre-primary schoolers and early primary grade children – needed emphasis and rationale. General principles to curricular approaches – activity based play-way , child- centred, theme-based, holistic, joyful, inclusive – meaning, rationale and practical implications in specific contexts; puppetry , musical and rhythmic exercises, dramatization, art activities indoor and outdoor play , field trips and explorations as methods in primary and early primary stages - meaning, rationale, selection criteria, method of transaction Local specific community resources – human and material & their integration in curricular activities; preparation & use of learning and play materials - principles and characteristics; community involvement in effective implementation of ECCE programme Informal evaluation through observation & remediation training of ECCE workers. Exhibitions, parent' day programmes etc.

SESSIONAL ACTIVITIES:


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PRIST DEEMED TO BE UNIVERSITY
DEPARTMENT OF EDUCATION
B.Ed. SYLLABUS, 1st YEAR SEMESTER -II
ENHANCING PROFESSIONAL CAPABILITIES / ELECTIVE
EXPLORING LIBRARY AND OTHER LEARNING RESOURCES
COURSE CODE: 22130EP24B

COURSE OBJECTIVES:

The student- teachers will be able to:

- CO1: Define library and acquire knowledge on information sources and services.
- CO2: Develop understanding about user education.
- CO3: Understand the place of MOOCs in the changing scenario.
- CO4: develop an understanding about organizing different types of library
- CO5: acquire knowledge about various instructional strategies to teach the students

UNIT I – EXPLORING LIBRARY AND INFORMATION SOCIETY

Library – Meaning – Definition – Types of Library; functions and objectives – laws of library science and implications in teacher education libraries. Information Science as a discipline and its relationship with other subject field.

UNIT II – INFORMATION SOURCES

Information: definition – sources of information – types of references – sources. Documentary Sources: Primary, Secondary and Tertiary – Non Documentary Sources: Electronic/Web learning – Sources – e book – e journal, e – learning – subject gateways in teacher education.

UNIT III – INFORMATION SERVICES

Reference Services – Types of reference services Current Awareness Services, Selective Dissemination of information, Translation service, Reprographic Services, Bibliographic Service, Indexing and Abstracting Services – on line services – learning resource centre.

UNIT IV – LIBRARY NETWORK

Library Automation – Digital Library, Electronic Library, Virtual Library, Library Networks: ERNET, DELNET, INFLIBNET – Documentation centres – NASSDOC, INSDOC – on line search of teacher education database – MOOCS.

UNIT V – USER EDUCATION

User Education in academic libraries – Role of teachers in the use of library. Library Committee: constitution and its functions. Library resources for classroom translations – encouraging reading and referring habit.

SESSIONAL ACTIVITIES:

- Study the Social Customs prevailing in the local community and submit a report.
- Study the religious diversities existing in the community and describe the root causes for such diversities.
- Education and vertical/ Horizontal Social Mobility – Conduct a Survey in a village/ward and prepare a report.
- Study the Social Stratification in a Village/ ward and prepare a report on it.
- Study the Essential skills & Life skills in education and prepare a report on it.

REFERENCES:

- Kusum, Veerma (2005) Digital Library: Preservation Strategies: New Delhi: Akansha Publishing House.
- Krishna Kumar (2004) Reference Services. New Delhi – Sterling Publishers.
- Navalani K. & Satija, MPC (1996). Library and Information Services: Emerging Challenges. Jaipur: RBSA Publishers.

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B.Ed. SYLLABUS, 1st YEAR SEMESTER -II
ENHANCING PROFESSIONAL CAPABILITIES /ELECTIVE
TEACHING OF EARLY CHILDHOOD EDUCATION
COURSE CODE: 22130EP24C

COURSE OBJECTIVES:

The student teacher will be able to

- CO1: develop awareness about the importance of Early Childhood Education.
- CO2: acquire a sound knowledge about the contributions of various philosophers to the cause of early childhood education.
- CO3: develop an understanding about organizing different types of early childhood education programmes.
- CO4: acquire knowledge about various instructional strategies to teach young children.
- CO5: develop awareness about the various developmental aspects of children.

UNIT I: HISTORY OF EARLY CHILDHOOD EDUCATION IN INDIA:

Concept of Early Childhood Education - Need and importance of Early childhood Education - Objectives - Early Childhood Education movement in India and Abroad - Problems of Early Childhood Education in India.

UNIT II: CONTRIBUTIONS OF PHILOSOPHERS TO PRE SCHOOL EDUCATION :

Contributions of Froebel- Rousseau-Montessori- Piaget- Comenius- Gandhiji-Tagore and Dhara Bai Modak.

UNIT III: PLANNING AND ORGANIZATION OF PRE SCHOOLS:

Planning of pre-school programmes - Yearly plan, Monthly plan, Weekly plan, Daily plan -Organisation of a pre-school - site, space, material, personal and time- Types of pre-school programmes - Nursery , Kindergarten, Montessori, pre-basic and Balwadi - Role of ICDS (Integrated Child Development Scheme).

UNIT IV: GROWTH AND DEVELOPMENT OF CHILD:

Developmental stages - parental period - factors affecting parental period- Birth hazards, immunization schedule - various aspects of development with special emphasis to early childhood period.

UNIT V: SPECIAL NEEDS AND PROBLEMS OF PRE-SCHOOL CHILDREN:

Needs of pre-school children - children with special needs - physical, visual and hearing impairment - Learning disabilities - Behaviour problems - Aggression, temper tantrum, stealing, lying, eating problems, nail biting, bed wetting, thump sucking - their causes and remedial measures.

SESSIONAL ACTIVITIES:

- Observe and inquire the process of learning by children from different backgrounds and record your observations.
- Prepare an album of any 10 psychologists and their contributions to the learning process.
- Visit any two Special Education Institutions and write a report on the methods of teaching.

REFERENCES:

- Hurlock, Elizabeth, B. (2001). Child growth and development, Tata McGraw Hill publishing company, New Delhi.
- Kaul Vinetha (2001). Early Childhood Education Programme. National council of Educational Research and Training, New Delhi.
- Mohanthy jagannath and Bhagyadhar Mohanthy (2000). Early Childhood care and Education, Deep and Deep Publication, New Delhi.
- Ruth Katherine et.al. (1987). Early Childhood programmes. New York


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B.Ed. SYLLABUS, 1st YEAR - SEMESTER –II
ENHANCING PROFESSIONAL CAPABILITIES /ELECTIVE
PROFESSIONAL COURSE FOR TEACHER PROFICIENCY
COURSE CODE: 22130EP24D

COURSE OBJECTIVES:

The student teachers will be able to

CO1: Acquire knowledge on various concepts of Pedagogy.

CO2: Extrapolate on various stages of developmental tasks.

CO3: Enumerate various aspects of guidance and counseling.

CO4: Apprise on cognitive development.

CO5: Acquire mastery in the professional course for teachers' proficiency.

UNIT I – CHILD DEVELOPMENT AND PEDAGOGY

Nature of Educational Psychology – Human Growth and Development – Cognitive Development – Social, Emotional and Moral Development – Learning – Intelligence and Creativity – Motivation and Group Dynamics – Personality and Assessment – Mental Health and Hygiene – Guidance and Counseling.

UNIT II – TEXT BOOK ANALYSIS

Syllabus prescribed for Standard VI, VII and VIII by Government of Tamil Nadu (From time to time) (Tamil, English and Subject)

UNIT III – TEACHING PROFICIENCY

Definition for Proficiency – The role of teacher in the class-room management - Tactics for effective Instructional communication - Criteria for the selection of Tools and Techniques for teaching and Learning.

UNIT IV - PROFESSIONAL ETHICS FOR TEACHER

Code of conduct of Teacher – Ethics and Etiquettes – Unethical activities – qualities of professional towards student development and curriculum – Right of Children to free and compulsory Education – concept of Disciplinary proceedings and Punishment.

UNIT V – LEADERSHIP PROFILE

School vision – Instructional Leader – Organizational Leader – Community Leader – communication skill commitment – Decision Making and Problem Solving- Transformational Leader.

SESSIONAL ACTIVITIES:

- Prepare a question paper for classes IX to X and XI to XII to asses all the aspects of language learning.
- Analyse the text books of English of Tamil Nadu Govt. in terms of organization and integration of essential components, skills, needs and requirements with special reference to learners.


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PRIST DEEMED TO BE UNIVERSITY
DEPARTMENT OF EDUCATION
B.ED. SYLLABUS SECOND YEAR SEMESTER – III
ENHANCING PROFESSIONAL CAPABILITIES / ELECTIVE
STRENGTHENING LANGUAGE PROFICIENCY
COURSE CODE: 22130EP33C

COURSE OBJECTIVES:

The students will be able to

CO1: Develop comprehending ideas, for reflection and thinking, as well as for expression and communication.

CO2: Enhance one's facility in the language of instruction is thus a vital need of student-teachers, irrespective of the subject areas that they are going to teach.

CO3: visualize as a range of primarily text-based language activities, which will aid in strengthening the ability to 'read', 'think', 'discuss and communicate' as well as to 'write' in the language of instruction.

CO4: Develop a taste for and abilities in reading and making meaning of different kinds of texts.

CO5: Use language for effective communication. Familiarize with nature and structure of English language

UNIT I: ENGAGING WITH NARRATIVE AND DESCRIPTIVE ACCOUNTS

The selected texts could include stories or chapters from fiction, dramatic incidents, vivid descriptive accounts, or even well-produced comic strip stories.

UNIT II: ENGAGING WITH POPULAR SUBJECT BASED EXPOSITORY WRITING

The selected texts could include articles, biographical writing, or extracts from popular non-fiction writing, with themes that are drawn from the subject areas of the student teachers (various sciences, mathematics, history, geography, literature/language pieces)

UNIT III: ENGAGING WITH JOURNALISTIC WRITING

The selected texts would include newspaper or magazine articles on topics of contemporary interest.

UNIT IV: ENGAGING WITH SUBJECT-RELATED REFERENCE BOOKS


For this Unit, the student-teachers should work in groups divided according to their subjects. Within these groups, pairs of student-teachers would make a choice of a specific topic in their subject area which they could research from a set of available reference books. The focus of this Unit is, as much the learning of effective processes of reference research and its presentation, as the actual reading of the reference books themselves.

UNIT V: ENGAGING WITH EDUCATIONAL WRITING

Selected texts could be drawn from the wide range of popular educational writing in the form of well-written essays, extracts or chapters from authors who deal with themes from education, schooling, teaching or learning. The writings selected should present a definite point of view or argument about some aspects of the above themes.

SESSIONAL ACTIVITIES:

- Write an essay on various contemporary social and educational emerging issues and problems in detail
- Enumerate the activities from the school text book
- Suggest your own activities using supplementary materials
- Analyse the tasks given at the end of any one unit in the text book


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PRIST DEEMED TO BE UNIVERSITY
DEPARTMENT OF EDUCATION
B.Ed. SYLLABUS SECOND YEAR SEMESTER – III
ENHANCING PROFESSIONAL CAPABILITIES / ELECTIVE
GENDER ISSUES IN EDUCATION
COURSE CODE: 22130EP33D

COURSE OBJECTIVES:

The student teacher will be able to:

CO1: develop basic understanding and familiarity with key concepts—gender, gender-bias, gender stereotype, empowerment, gender parity, equity and equality, patriarchy and feminism;

CO2: understand the gradual paradigm shift from women's studies to gender studies and some important landmarks in connection with gender and education in the historical and contemporary period;

CO3: learn about gender issues in school, curriculum, textual materials across disciplines, pedagogical processes and its intersection with class, caste, religion and region; and

CO4: understand how gender, power and sexuality relate to education (in terms of access, curriculum and pedagogy).

CO5: understand how the female, power and sexuality relate to education.

UNIT I: GENDER ISSUES: KEY CONCEPTS

Gender, sex, sexuality, patriarchy, masculinity and feminism - Gender bias, gender stereotyping, and empowerment - Equity and equality in relation with caste, class, religion, ethnicity, disability and region.

UNIT II: GENDER STUDIES: PARADIGM SHIFTS

Paradigm shift from women's studies to gender studies - Historical backdrop: Some landmarks from social reform movements of the nineteenth and twentieth century's with focus on women's experiences of education - Contemporary period: Recommendations of policy initiatives commissions and committees, schemes, programmes and plans.

UNIT III: GENDER, POWER AND EDUCATION

Theories on Gender and Education: Application in the Indian Context - Gender Identities and Socialization - Schooling of Girls: Inequalities and resistances (issues of access, retention and exclusion).

UNIT IV: GENDER ISSUES IN CURRICULUM

Gender, culture and institution: Intersection of class, caste, religion and region - Curriculum and the gender question - Construction of gender in curriculum framework since Independence: An analysis - Gender and the hidden curriculum - Gender in text and context (textbooks' inter-sectionalist with other disciplines, classroom processes, including pedagogy) - Teacher as an agent of change - Life skills and sexuality.

UNIT V: GENDER, SEXUALITY, SEXUAL HARASSMENT AND ABUSE

Linkages and differences between reproductive rights and sexual rights - Development of sexuality, including primary influences in the lives of children (such as gender, body image, role models) - Sites of conflict: Social and emotional - Understanding the importance of addressing sexual harassment in family, neighbourhood and other formal and informal institutions - Agencies perpetuating violence: Family, school, work place and media (print and electronic) - Institutions redressing sexual harassment and abuse.

SESSIONAL ACTIVITIES:


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B.Ed. SYLLABUS – SECOND YEAR SEMESTER – IV
ENHANCING PROFESSIONAL CAPABILITIES / ELECTIVE
UNDERSTANDING THE SELF
COURSE CODE: 22130EP45B

COURSE OBJECTIVES:

The Student – Teachers will be able to:

CO1: Enable students to develop a vision of life for themselves.

CO2: Encourage students to give conscious direction to their lives to take responsibility for their actions.

CO3: Develop a holistic and integrated understanding of the human self and personality.

CO4: Facilitate the personal growth of the students by helping them to identify their own potential.

CO5: Develop the power of positive attitude.

UNIT – I EXPLORING THE AIM OF LIFE WORKSHOP THEMES:

Vision as a person - aspiration and purpose of life – Giving a conscious direction to life – Understanding difference dimensions of self and personality and way in which they influence the dynamics of identity formations, values and direction of life.

UNIT – II DISCOVERING ONE'S TRUE POTENTIAL:

Understanding one's strengths and weaknesses through self observation exercises – Taking responsibility for one's own actions – Developing positivity, self esteem and emotional integration – Exploring fear and trust competition and cooperation – Developing skills of inner self organization and self reflection – Writing a self-reflective journal

UNIT – III DEVELOPING SENSITIVITY:

Understand and challenge the unconscious, conditional attitudes that are stereotyped and prejudiced gender, caste, class, race region, disability etc and critically examine the sources of stereo typed messages (eg. media) – Defining consciously one's own values towards self and society and develop a capacity to understand and appreciate divergent points of view – Widening their realm of consciousness – Developing the capacity for empathic listening and communications skills – Understanding one's own childhood and adult – child gaps in society.

UNIT – IV PEACE, PROGRESS AND HARMONY:

Establishing peace with in oneself - exercises of concentration and meditation – Understanding group dynamics and communication – Creating group harmony – Exploring methods of creating a collective aspiration for progress and conflict resolution – Exploring the bases of social disharmony: becoming the agents and catalysts of change and exploring methods of facilitating change.


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B.Ed. SYLLABUS - SECOND YEAR SEMESTER - IV
ENHANCING PROFESSIONAL CAPABILITIES / ELECTIVE
ADDRESSING SPECIAL NEEDS IN THE CLASSROOM
COURSE CODE: 22130EP45D

OBJECTIVES:

The student- teachers will be able to:

- CO1: demonstrate knowledge of different perspectives in the area of education of children with disabilities;
- CO2: reformulate attitudes towards children with special needs;
- CO3: identify needs of children with diversities;
- CO4: plan need-based programmed for all children with varied abilities in the classroom;
- CO5: use human and material resources in the classroom;

UNIT I: PARADIGMS IN EDUCATION OF CHILDREN WITH SPECIAL NEEDS

Historical perspectives and contemporary trends - Approaches of viewing disabilities: The charity model, the bio centric model, the functional model and the human rights model - Concept of special education, integrated education and inclusive education; Philosophy of inclusive education.

UNIT II: LEGAL AND POLICY PERSPECTIVES

Important International Declarations/Conventions/Proclamations – Biwako Millennium Framework (BMF, 1993-2012); Recommendations of the Salamanca Statement and Framework of Action, 1994; Educational Provisions in the UN Convention on the Rights of Persons with Disabilities (UNCRPD), 2006; Constitutional Provisions; Programmed and Schemes of Education of Children with Disabilities;

UNIT III: DEFINING SPECIAL NEEDS

Understanding diversities-concepts, characteristics, classification of children with diversities (Visual Impairment, Hearing Impairment, Specific Learning Difficulties, Locomotors and Neuromuscular Disorders, Mental Retardation, Autism, Leprosy Cured Persons, Mental Illness and Multiple Disabilities) - Special needs in terms of the curriculum in the context of different disabilities and their learning styles - Concept of an inclusive school – infrastructure and accessibility, human resources, attitudes to disability, whole school approach.

UNIT IV: INCLUSIVE PRACTICES IN CLASSROOMS FOR ALL

School's readiness for addressing learning difficulties - Assessment of children to know their profile - Technological advancement and its application – ICT, adaptive and assistive devices, equipments and other technologies for different disabilities - Classroom management and organization - Responding to special needs by developing strategies for differentiating content, curricular adaptations, lesson planning and TLM

UNIT V: DEVELOPING SUPPORT NETWORKS

Addressing social climate of the classroom - Child-to-child programmed - Developing partnerships in teaching: Teacher and special teacher; Teacher and co-teaching personnel; Parents as partners - developing positive relationships between school and home - Involving community resources as source of support to teachers- Involving external agencies for networking – setting up appropriate forms of communication with professionals and para professionals.

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M.Ed. SYLLABUS-SEMESTER-I
SPECIALIZATION CORE COURSE-I
EARLY CHILD CARE AND EDUCATION
COURSE CODE: 22230SC15A**

COURSE OBJECTIVES:

1. Know the historical development of early childhood care and education.
2. Understand the different aspects of child development.
3. Review the various committees and commissions suggestions on early childhood education.
4. Execute the principles of planning and management of early childhood care and education.
5. Explain the various organizations contributions in early childhood care and education.

UNIT-I: OVERVIEW OF EARLY CHILDHOOD EDUCATION

Early Childhood Education: Concept, meaning, nature, objectives, need and importance – Early Childhood Education Movement in India and Abroad – Prominent promoters of Early Childhood Care and Education: Plato, Rousseau, Montessori, Froebel, Piaget, Tagore, Gandhi, Aurobindo, Giju Bhai Patil and Tarabai Modak.

UNIT-II: DEVELOPMENT DURING EARLY CHILDHOOD PERIOD

Pattern and Factors influencing the Physical development, Motor development, Emotional development, Social development, Cognitive development and Language development of the Pre-school children – Concept development: Importance and learning of various concepts such as size, shape, colour, weight, time and number.

UNIT – III: COMMITTEES AND COMMISSIONS ON EARLY CHILDHOOD CARE AND EDUCATION

Sargent Report (1944), Secondary Education Commission (1952-53), Child Care Committee (1963-64), Indira Education Commission (1964-66), Report of the Study Group (1972), National Policy on Education (1986), Millennium Development Goals (2000), National Focus Group on ECCE (2006) and Education for All Global Monitoring Report (2007) – International Treaties on Agreement relating to ECCE: Declaration of Human Rights (1948), Declaration of the Rights of the Child (1959), Convention on the Rights of the Child (1989), Salamanca Statement (1994) and Dakar Framework for Action of Education for All (2000).

UNIT – IV: PLANNING AND MANAGEMENT OF EARLY CHILDHOOD CARE AND EDUCATION

Principles involved in planning Pre-school programmes – Short-term and Long-term planning – Importance of Rhymes, Songs, Stories, Science exhibitions, Field trips, Puppet shows and Dramatization – Habit formation: Eating, Sleeping, Dressing and Toilet training- Requirements for Starting Early Childhood Care and Education: Finance, Place, Building, Staff and Records – Crèches: Aims, objectives, importance, and types.

UNIT – V: ORGANISATIONS INVOLVEMENT IN HEALTH CARE OF EARLY CHILDHOOD STAGE

Organizations working for pre-school education: NIPCCD (National Institute for Co-operative Child Development), NCERT, ICDS, UNICEF and CARE (Co-operative Assistance and Relief Everywhere) – Nutrition and Health of an Early Childhood Stage – Common Communicable Diseases of Early Childhood Stage.

SUGGESTED ACTIVITIES:

1. Make a resource file on collection of pictures, available materials and articles related early Childhood Education.
2. Visit to ICDS center and observing the ICDS Programme.

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SCHOOL OF EDUCATION
M.Ed. SYLLABUS-SEMESTER-I
SPECIALIZATION CORE COURSE-III
INCLUSIVE EDUCATION
COURSE CODE: 22230SC15C

COURSE OBJECTIVES:

1. Enable students to understand the historical perspectives on education of children with diverse needs
2. Develop critical understanding of the recommendations of various commissions and committees towards inclusive education.
3. Understand the nature of difficulties encountered by children and prepare conducive teaching learning environment in inclusive schools,
4. Analyze special education, integrated education, mainstream and inclusive education practices, identify and utilize existing resources for promoting inclusive practice.
5. To develop awareness of learner towards inclusive education and its practices.

UNIT-I: INTRODUCTION TO INCLUSIVE EDUCATION

Definition- concept and importance of inclusive education - Historical perspectives on education of children with diverse needs - Difference between special education, integrated education and inclusive education - Advantages of inclusive education for education for all children.

UNIT-II: CONCEPT AND NATURE

Concept and principles of Inclusion - Benefits of Inclusion - Need of Inclusive education - Policies and legislations for Inclusive Education and Rehabilitation - National legislation's for Inclusive Education - Government Scheme and Provisions.

UNIT-III: COMPETENCIES DEVELOPMENT FOR INCLUSIVE EDUCATION

Theories of Inclusive Education - Philosophical Approaches to Inclusive Education - Attitude and positive behavior for Inclusion - Developing attitude and Competencies for Inclusion - Attitude, Self- Efficacy, Skill and Ideologies - Social skills for Inclusion.

UNIT-IV: RECOMMENDATIONS OF EDUCATION COMMISSIONS AND COMMITTEES INTERNATIONAL INITIATIVES

The Convention on the Rights of the Child - the World Declaration on Education - World Declaration on the Survival, Protection and Development of Children - Plans of action - Asian and Pacific decade of Disabled Persons - World Conference on Special needs Education and the Salamanca Statement and framework for action on Special Needs Education - National Initiatives - Indian Education Commission - integrated Education for Disabled Children - National Policy on Education - Establishment of National Institutes and their Regional Centers - Project Integrated Education for disabled children - District Primary Education Programme - Persons with Disabilities Act - Sarva Shiksha Abhiyan - Mental Health Act, - Rehabilitation Council of India Act, Persons with Disabilities Act, Protection of rights and full participation, National Trust for the Welfare of Persons with Autism.

UNIT-V: PREPARATION FOR INCLUSIVE EDUCATION


Concept and meaning of diverse needs - Educational approaches and measures for meeting the diverse needs - concept of remedial education, special education, integrated education and inclusive education - Brief account of existing special, integrated and inclusive education services in India - Building inclusive learning friendly classrooms, overcoming barriers for inclusion - Creating and sustaining inclusive practices - Role of teachers, parents and community for supporting - Techniques and methods used for adaptation of content, laboratory skills and play material.

SUGGESTED ACTIVITIES:

1. Various types of educational needs of children with respect to education identified
2. Mastery lecture on Government Scheme and Provisions for Inclusive Education


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M.Ed.SYLLABUS-SEMESTER-II
SPECIALIZATION CORE COURSE-IV
ADVANCED EDUCATIONAL TECHNOLOGY
COURSE CODE: 22230SC25A

COURSE OBJECTIVES:

1. Understand the meaning of Educational Technology
2. Attain knowledge about behavioural technology
3. Understand the features, working and use of the Internet and web
4. Appreciate the use of multimedia and web content for teaching learning
5. Attain knowledge about e-learning

UNIT-I: INTRODUCTION TO ICT

ICT meaning and importance- Introduction to computer - Types of Computers - Computer in Education - Characteristics of Computer - Role of ICT - Different uses of computer in education - Advantages and disadvantages of Computer - Assisted Instruction education - Introduction to a personal computer - standard computer accessories-their configurations-conceptions and functioning- Functional overview of the operating system- Standard office and media selection.

UNIT-II: BEHAVIOURAL TECHNOLOGY

Technology-Meaning and nature-Microteaching-meaning and objectives-Different phases of microteaching-Merits and demerits of microteaching - Microteaching cycle-Meaning and nature- Programmed instruction-Meaning-nature and principles-Types of programmed instruction-Linear-Branching and Mathematics-Merits and demerits of programmed instruction.

UNIT-III: INTERNET AND THE WORLD WIDE WEB

The internet and the World Wide Web-Information-services and functions of the Internet and the web-connecting to and using the web- using search engines and web utilities-keywords and search strategies-synchronous and asynchronous communication on the web-e-mail-chat-news groups and forum- Websites with educational content-Search-locate and maintain lists of educational web sites-Critically examine the content of websites-using the web as a teaching-learning resource - Academic and Research content on the web- Online journals and abstraction services.

UNIT-IV: MULTIMEDIA AND WEB CONTENT

Multimedia packages- educational implications of media use and interactivity-websites with educational content-using the web as a teaching-learning resource-online learning- Multimedia Content-Multimedia packages - installation and use-Critical analysis of multimedia content-educational implications of media use and interactivity.

UNIT-V: NEW HORIZONS OF EDUCATIONAL TECHNOLOGY

Elements of e-learning,e-content and e-books-virtual classroom and virtual university-merits and limitations-Recent trends in the area of educational technology-interactive video-video-conferencing -M-learning-MOOC-Watsup etc-Recent experiments in the third world countries and pointers for India with reference to Education.

SUGGESTED ACTIVITIES:

1. Prepare a power point presentation for any two units in Educational Technology and submit it.
2. Develop a Blog of your own and add it online.
3. Visit to any IT Company to know about latest software's.
4. Analyse any one topic in different website and present your report by comparing it.
5. Explore the Usage of Office 365 and write the merits and demerits in CD.

TEXT BOOKS:

1. Kulkarni, S.S.- Introduction to Educational Technology, New Delhi-Oxford.

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M.Ed. SYLLABUS – SEMESTER – III
PERSPECTIVE COURSE V
SOCIOLOGY OF EDUCATION
COURSE CODE: 22230PC31

COURSE OBJECTIVES:

1. Enable the students to understand the basic concepts of sociology of education
2. Motivate the students to explore the relationship between social system and education
3. Make the students to analyze the role of education in cultural change
4. Enable the students to identify various agencies of education
5. Make the students to examine the role of education in promoting national integration and international understanding

UNIT-I: SOCIOLOGY AND EDUCATION

Sociology of Education: Meaning, concept and importance – Sociology and Education - Basic concepts of sociology and education. - Difference between sociology of education and Educational Sociology – Scope and functions of educational Sociology.

UNIT-II: SOCIAL SYSTEM AND EDUCATION

Social System: Meaning, Concept and Characteristics, Education as a Subsystem – Education and Social change; Social mobility, social stratification, social deviants; Constraints on social change in India (Caste, ethnicity, class, language, religion, regionalism).

UNIT- III: PROCESS OF SOCIALISATION

Agencies of socialization- Family, School, Religion, Community - Education as a social system, social process and social progress; Technological change – Industrialization, Modernization and Urbanization.

UNIT IV: EDUCATION AND DEMOCRACY

Democracy: Meaning and concept- Education and Democracy- Education for national integration and international understanding- Constitutional ideals of education- Social equity and equality of educational opportunities – Education for socially and economically disadvantaged section of the society: SC/ST/OBC/Women/ Disabled and rural population.

UNIT V: EDUCATION IN CULTURAL CONTEXT

Culture: Meaning, concept and characteristics - Education and cultural change - Cultural lag – Meaning, concept, major causes and its effect on education – Education for multi-lingual and multi-cultural Indian society.

SUGGESTED ACTIVITIES:

1. Discussion on the relationship between Sociology and Education.
2. Analyse the Constraints on social change in India.
3. Collect details on the type of educational facilities available for socially and economically disadvantaged section of the society in India
4. Discussion on social equity and equality of educational opportunities
5. Power Point presentation on educational sociology and their educational implications

TEXTBOOKS:

1. Agarwal J.C.(2002). *Philosophical and sociological perspectives on education*. Shipra.
2. Jayapalan, N.(2001). *Sociological theories*. Atlantic Publishers.
3. Mujibul Hasan Siddiqui (2009). *Philosophical and sociological perspectives in Education*. Neeraj.
4. Ruhela, S.P.(1970). *Sociological foundation of education in contemporary India*, Dhanpat Rai.

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M.Ed.SYLLABUS-SEMESTER-III
TOOL COURSE- EDUCATIONAL MEASUREMENT AND EVALUATION
COURSECODE:22230TC33

COURSE OBJECTIVES:

1. Comprehend the concept, meaning and nature of measurement and evaluation
2. Understand the relationship between measurement and evaluation.
3. Acquire knowledge about various tools of measurement and evaluation in existence.
4. Develop skills on using psychological test for measurement and evaluation.
5. Get hands on SPSS to learn various statistical measurement and its analysis.
6. Enable to distinguish various competencies in standardizing different types of measuring instrument.
7. Familiarize to construct different kinds of tests and tools.
8. Obtain knowledge on statistical concepts, test scores and its transformation.
9. Assimilate the new trends in evaluation in terms of grading, semester, CCE and online test.
10. Prepare question banks and other self-study materials.

UNIT-I: CONCEPT OF MEASUREMENT AND EVALUATION

Measurement and Evaluation – Concept, Meaning, nature and need. Relationship between measurement and evaluation, Functions of measurement and evaluation.

UNIT-II: TOOLS OF MEASUREMENT AND EVALUATION

Subjective and objective tools - Tests: Essay tests, objective test, scales, questioners, schedules, inventories, observation, interviews, performance tests, oral tests-diagnostic tests and remedial measures.

UNIT-III: PSYCHOLOGICAL TESTING

Construction and Standardization of Psychological tests, Aptitude, Attitude, personality tests. Intelligence and its nature - Theories: Spearman, Thorndike, Thurston and Guilford - Types of intelligence test-their functions and uses.

UNIT-IV: STATISTICAL CONCEPTS

Test scores and their transformation: Z and T Scores, percentile- Interpretation of qualitative data. Correlation analysis, Item analysis – Basic assumption, Methods


UNIT-V: NEW TRENDS IN EVALUATION

Grading System, Semester system, Continuous Comprehensive Evaluation, Question Bank, uses of computer in evaluation.

1. .

TEXTBOOKS:

1. Adams, G.S.(1964). *Measurement and evaluation in education, psychology and guidance*. Holt, Rinehart & Winston.
2. Anastasi.(1984). *Anne psychological testing*. The MacMillan.
3. Aggarwal, Y.P.(1998). *Statistical methods*. Sterling.
4. Cooper, D.(2007). *Talk about assessment, strategy and tools to improve learning*. Thomson Nelson.
5. Earl, L.M.(2006). *Assessment as learning: Using class room assessment to maximize student learning*. Corvine Press.


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M.Ed.SYLLABUS-SEMESTER-
II OIPERSPECTIVE COURSE VI EDUCATIONAL STUDIES
COURSE CODE: 22230PC41

COURSE OBJECTIVES:

1. Understand the theoretical perspectives of education as a discipline in terms of social, cultural, political, economic, technological factors, and other substantial education system and the process of knowledge construction.
2. Explore the widening of interdisciplinary knowledge in education with respect to philosophy, psychology, sociology, management, economics, anthropology, ICT, etc. and insightful construction of knowledge.
3. Incorporate the socio-cultural context of India, in line with 'unity in diversity' with reference to multilingual and multicultural, socialisation and acculturation among the community and its stakeholders, Equality in educational opportunities and education for socio-economically deprived groups and Policy of inclusion and multi-foundational approaches to learning disabilities.
4. Acquire knowledge about multiple school contexts and its personnel management system, contemporary challenges, participation of different stakeholders and re-conceptualised learning resources.
5. Acquaint with institutions, systems and structure of education along with its various regulatory and advisory bodies in education.

UNIT-I: THEORETICAL PERSPECTIVES OF EDUCATION AS A DISCIPLINE

Education as a socially contrived system influenced by social, cultural, political, economic, and technological factors - Critical analysis of concepts, principles, theories, assumptions related to education discipline, sustainable education, schooling, curriculum, syllabus, textbooks, assessment, teaching-learning process - Critical analysis of education as a discipline - Aims of Indian Education in democratic, secular, egalitarian and humane society - Bridging gap of knowledge construction between: Content knowledge and Pedagogy knowledge; School knowledge and out of the school knowledge; Experiential knowledge and empirical knowledge; Knowledge on action and reflection on outcome of action; Theoretical knowledge and practical knowledge; Universal knowledge and contextual knowledge.

UNIT-II: EDUCATION AS AN INTERDISCIPLINARY KNOWLEDGE

Interdisciplinary nature of education pertinent to philosophy, psychology, sociology, management, economics, anthropology, ICT etc. and the framework for insightful construction of knowledge - Contribution of science and technology to education and challenges ahead - Axiological issues in education: Role of peace and other values, aesthetics in education - Issues in planning, management and monitoring of schools and teacher education in behavioural management - Interrelation between education and development.


UNIT- III: SOCIO-CULTURAL CONTEXT OF EDUCATION

Social purposiveness of education - Understanding Indian society: Multilingual and multicultural, appropriate approaches for teaching of diversity - Process of socialization and acculturation of the child - critical appraisal: Role of school, parents, peer group, community and other stakeholders - Equality in educational opportunity - critical analysis in schooling, teaching-learning and curriculum for social inequality - Education of socio-economically deprived groups based on gender, local (rural/urban), income differential and different disabilities in society - Policy of inclusion and multi-foundational approaches to learning disability.

UNIT-IV: SCHOOL CONTEXT

Multiple school contexts: Rural/urban, tribal etc. - Role of personnel's in school management: Teacher, headmaster, and administrators - Nurturing learner friendly school

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M.Ed. SYLLABUS – SEMESTER –
IV PERSPECTIVE COURSE VIII
COMPARATIVE EDUCATION
COURSE CODE: 22230PC42

COURSE OBJECTIVES:

1. Understand the need, scope and history of comparative education.
2. Comprehend the primary and secondary education's aims and methods of instruction in U.S.A, U.K, Japan, Finland and India.
3. Analyze the role of national and state government on education.
4. Explore the comparative education of primary and secondary education of U.S.A, U.K, Japan, Finland and India.
5. Realize the issues and challenges in primary and secondary education of perspective of countries: U.S.A, U.K, Japan, Finland and India.

UNIT-I: HISTORY OF COMPARATIVE EDUCATION

Comparative Education: meaning, need and scope, brief history of comparative education-Determinants of a National education system: Geographical, social, economic, political, cultural, linguistic, historical etc. approaches to comparative education, historical, sociological, philosophical and scientific approaches.

UNIT-II: PRIMARY EDUCATION AND SECONDARY EDUCATION

Primary and Secondary Education in U.S.A, U.K, Japan and India - Aims, Content, Methods of Instruction and Evaluation system. Concept of Universalization of Primary Education in India: its implications- Salient features of Education system of U.S.A, U.K, Japan and India.

UNIT-III: CONSTITUTIONAL PROVISIONS FOR COMPARATIVE EDUCATION

Basic requirements of Education in different countries- Constitutional Provisions for Comparative Education – Federal Acts on Education – Relationship between Federal, State and Local Governments – International Project for the Evaluation of Educational Achievement (IEA). Universal compulsory Education – Higher Education – Educational Finance – World Bank – UNESCO, UNICEF and IMF.

UNIT-IV: COMPARATIVE EDUCATION AT PRIMARY AND SECONDARY LEVEL

Comparative Education: Importance of Comparison- study about comparative education at primary and secondary level in U.S.A., U.K. Japan and India. Vocationalization of Secondary Education.

UNIT-V: ISSUES AND CHALLENGES IN EDUCATION

Issues and challenges in primary and secondary education from the perspective of countries: U.S.A., U.K. Japan, Finland and India. Education for disadvantaged Children, Girls' education, Child-labour, Teacher education, expenditure and quality concerns in Elementary education.

SUGGESTED ACTIVITIES:

1. Group discussion on the need, meaning and scope of comparative education.
2. Prepare scrapbook on the system of primary education and secondary education in U.K, U.S.A, Japan, Finland and India.
3. Debate the role of Federal and State government on education.
4. Explore the issues and challenges in primary and secondary education from the per-

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M.Ed.SYLLABUS-SEMESTER-IV
TOOL COURSE- ICT ON TEACHING AND
LEARNING COURSE CODE: 22230TC43**

COURSE OBJECTIVES:

1. Develop the professional ability in ICT
2. Understand the impact of ICT
3. Explain the various educational resources
4. Describe the various assessment techniques
5. Explain ways to create online community

UNIT-I: INFORMATION AND COMMUNICATION TECHNOLOGY (ICT)

Definition, meaning, importance and scope of ICT-

Applications of Information and Communication Technologies-

Classroom and ICT; Professional development and ICT-Emergence of new information technology-convergence of computing and telecommunications.

UNIT-II: ICT MEDIATED EDUCATION

Concept, Importance, Meaning, Objectives & Nature of ICT mediated education- Teaching-Learning Environment: Types and Modes of using ICT - Learning Environments - Features of an ICT Mediated Teaching-Learning Environment-Physical Constituents of Classroom/Environment-Social Constituents-Supporting Learners in learning

UNIT-III: ICT AND TEACHING LEARNING PROCESS

ICT and Teaching and learning Process-Need for ICT Selection-Factors affecting ICT Selection-Selection of ICT - Integration of ICT - TPACK - E-learning, Web based learning, MOOC - Educational resources.

UNIT-IV: ICT FOR EDUCATIONAL MANAGEMENT AND ASSESSMENT

Definition - e-governance - importance of ICT in manpower planning and HRD - Applications of ICT in Educational Management-Use of ICT in financial management- Creating online community of Parents, Teachers and students for Effective management- TQM and applications of ICT in TQM - Concept and meaning of Computerized Test construction and Administration -Role of ICT in Assessment - Web based Assessment - Electronic support as a tool in assessment process- Use of Blogs for assessment- Advantages and Disadvantages of ICT based assessment

UNIT-V: ARTIFICIAL INTELLIGENCE (AI) IN EDUCATION

Artificial intelligence: Meaning and history - AI integrated education - Principles and objectives of AI integrated learning- Role of schools in the success of AI integrated learning- Meeting of National Goals through AI integration- Assessment of AI integrated learning.

SUGGESTED ACTIVITIES:

1. Select any one topic in the B.Ed. syllabus and integrate ICT in the selected topic
2. Create an online community to integrate the students and teachers in the classroom
3. Administer a Test using ICT
4. Create a personal blog and upload the ICT tools in the blog
5. Visit a nearby Teacher Education Institution and teach the students using ICT

TEXTBOOKS:

1. Kulkarni, S.S. (1986). *Introduction to Educational Technology*. Oxford & IBH.
2. Kumar, K.L. (1997). *Educational Technology*. New Age International (P) Ltd
3. Mangal, S.K. (2002). *Essentials of teaching learning and information technology*.

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PRIST DEEMED TO BE UNIVERSITY
SCHOOL OF EDUCATION
M.Ed.SYLLABUS-SEMESTER-IV
SPECIALIZATIONCORECOURSE-XGUIDANCE AND
COUNSELINGCOURSECODE:22230SC45

COURSE OBJECTIVES:

1. Enable the students to explain the conceptual aspects of Guidance and procedural aspects of guidance services.
2. Make the students to understand the knowledge about theoretical and procedural issues in Educational and Vocational guidance.
3. Enable the students to explain the role of counsellor, and Teacher in the guidance programme.
4. Enable the students to identify the different activities rendered by the different guidance personnel.
5. Make the students to familiarize with self, group and career appraisal techniques.

UNIT-I: CONCEPT OF GUIDANCE

Guidance - Concept, need, scope, assumptions, issues and problems of guidance. Difference between Guidance and Counselling. Bases of Guidance - Philosophical, Psychological and Sociological. Types of Guidance - Educational, Vocational, Recreational, Social and Moral, Personal, Leadership and Health, Group and Individual Guidance. Aims and Objectives of Guidance - as per the recommendations of Kothari Commission.

UNIT-II: THE GUIDANCE SERVICE

Organizing Guidance service in School - Principles and importance, Role of Headmaster, Teachers, Parents and Counsellor's in organizing guidance services in School. Pupil Personal work - Its nature, scope and relation to vocational guidance. The Student Information Services, the Counselling Services, Placement Service, Occupation Information Service, Individual Inventory Service.

UNIT-III: TECHNIQUES AND THEORIES OF GUIDANCE

Techniques - Testing and Non-Testing. Essential in launching Guidance Programme - Science of information needed, use of interview and questionnaire in collecting information. Appraisal of Personal quality and interest - Inventory, Rating Scales, Anecdotal Record, Socio-metric methods, Cumulative Record Cards. Theories of Vocational Guidance - Ginsberg's theory and Super's Vocational Choice Theory.

UNIT-IV: COUNSELLING

Counselling - Concept, steps, Individual and group, Counselling, Approaches of Counselling - Directive Counselling, Non Directive Counselling, Eclectic Counselling and their utility, Role of the Career Master. Vocational Counselling Service - Nature, Qualification of the Vocational Counsellor. Place of counselling in a vocational guidance programme, counselling for all, setting, preparing and conducting the interview, Teacher Counsellor, Vocational Counsellor, Characteristics of a Coordinator.

UNIT-V: GUIDANCE FOR EXCEPTIONAL CHILDREN

Guidance for Exceptional Children - Meaning and Types. Guidance for gifted, backward, mentally retarded, orthopedically handicapped, visually impaired, deaf and dumb, juvenile delinquents guidance for dropouts - Socially disadvantaged children - Alcoholics Addicts - Sexual harassment - Eve teasing - Gender discrimination - Exemptions in examination for exceptional children.

SUGGESTED ACTIVITIES:

1. Conduct an interview of B.Ed students of any college, to find out the burden/psychological effects of practical/other programme. Mention how counsel/guide them


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SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

BOARD OF STUDIES
2022-2023



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SCHOOL OF ENGINEERING AND TECHNOLOGY
DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

BOARD OF STUDIES MEETING
CIRCULAR

10.06.22

The BOS Meeting is scheduled on 16.06.22 at 11.00 am in the Gallery Hall of 'A' Block at PRIST Deemed to be University Vallam Campus under the Chairmanship of Prof. Dr. Avirajamanjula. All are requested to attend the meeting without fail.

AGENDA OF THE MEETING:

1. To confirm the minutes of the previous meetings.
2. To discuss the action taken on the previous meeting minutes.
3. To scrutinize the stakeholders feedback on B.Tech (FT/PT).
4. To scrutinize the stakeholders feedback on M.Tech Power Systems (FT/PT).
5. To introduce the syllabus contents of two newly added Value added courses.
6. To introduce the syllabus contents of Audit Skill courses.
7. To discuss upon the Programme Educational Objectives (PEOs), Programme Outcomes (POs) and Programme Specific Outcomes (PSOs) of B.Tech (FT/PT) and M.Tech Power Systems (FT/PT).
8. To recommend the panel of Examiners for B.Tech(FT/PT).
9. To recommend the panel of Examiners for M.Tech Power Systems (FT/PT).

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SCHOOL OF ENGINEERING AND TECHNOLOGY
DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING
MINUTES OF THE MEETING OF THE BOARD OF STUDIES (BOS)

Board: EEE

The Meeting of Board of Studies (BOS) was held as given below:

Name of the Body	Board of Studies(BOS)
Department	Electrical and Electronics Engineering
Meeting No	12
Date and Time	16-06-22 @ 11.00 Am
Venue	Gallery Hall, 'A' Block
Members Attended	The details are given in the ANNEXURE-I

AGENDA	
1.	To confirm the minutes of the previous meetings.
2.	To discuss the action taken on the previous meeting minutes.
3.	To scrutinize the stakeholders feedback on B.Tech (FT/PT).
4.	To scrutinize the stakeholders feedback on M.Tech Power Systems (FT/PT).
5.	To introduce the syllabus contents of newly added Value added courses.
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7.	To discuss upon the Programme Educational Objectives (PEOs), Programme Outcomes (POs) and Programme Specific Outcomes (PSOs) of B.Tech (FT/PT) and M.Tech Power Systems (FT/PT).
8.	To recommend the panel of Examiners for B.Tech (FT/PT).
9.	To recommend the panel of Examiners for M.Tech Power Systems (FT/PT).
10.	Any other matter

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R. Suresh
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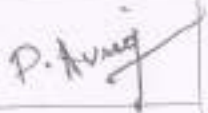


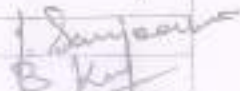
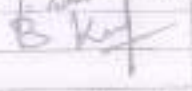
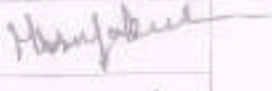
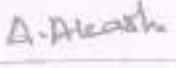
ATTENDANCE OF THE [12 Twelfth] BOARD OF STUDIES MEETING
Board:EEE

Date: 16-06-2022

Time:11.00 Am


Venue: Gallery Hall, 'A' Block

The following members were present for the Board of Studies meeting

S.No.	Name/Degree/Designation	Institute/Organization/ Full address	Online/ Physical	Signature
1.	Prof. Dr. Avirajamanjula- Chairman	Dept of EEE, PRIST DU	Physical	
2.	Dr. M. P. Selvan, Professor, NIT - Trichy External Members	National Institute of Technology, Tiruchirappalli.	Physical	
3.	Mr. R.Sambath External Members	AEE /Distribution, TNEB, Mannargudi	Physical	
4.	Mr. J.Sanjeevikumar,Professor	Dept of EEE, PRIST DU	Physical	
5.	Mr. B.Kunjurajaputham,Professor	Dept of EEE, PRIST DU	Physical	
6.	Mrs. S. Geetha	Dept of ECE, PRIST DU	Physical	
7.	Mr. Vijayakumar .	Dept of MECH, PRIST DU	Physical	
8.	A.Akash Student	III EEE, PRIST DU	Physical	

Date: 16/06/2022


BOS Chairman/HOD
Seal


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MINUTES OF THE MEETING

At the outset, the Chairman BOS welcomed the members for attending the meeting of the Board of Studies. In her introductory remarks, she described the agenda items.

Agendum 1:

Discussion: To confirm the previous BOS Meeting Minutes and to discuss the action taken on the previous BoS Meeting Minutes.

Resolution: The chairman confirmed the previous meeting minutes of BoS and discussed the action taken on the previous BOS Meeting Minutes.

Agendum 2:

Discussion: To scrutinize the abstract of stakeholders feedback on existing curriculum and syllabi for B.TECH-EEE (Full Time/Part Time) and M.TECH- Power System (FullTime/Part Time).

Resolution: The members of the Board thoroughly scrutinized the existing curriculum and syllabi and the abstract of stakeholders feedback on B.TECH-EEE (Full Time/Part Time) and M.TECH- Power System (Full Time/Part Time) and resolved to revise the curriculum in the subsequent syllabus revision.

Agendum 3:

Discussion: To discuss about B. Tech (FT) syllabus revision of higher semesters subject to the prevailing condition.

Resolution: Subject to the prevailing condition, syllabus revision is to be carried out for the higher semesters of B. Tech (FT).

Agendum 4:

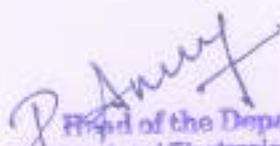
Discussion: To accommodate the suggestions revealed by stakeholders and to incorporate them as revised syllabus for B. Tech (PT) & M. Tech- Power System (FT/PT).

Resolution: The members of the board have unanimously recommended to introduce the new courses with the revised curriculum and syllabi for B.TECH-EEE(PT) & M.TECH - Power System (FT/PT).

Agendum 5:

Discussion: To recommend the panel of Examiners for B. Tech (FT/PT) and for M. Tech-Power System with (FT/PT).

Resolution: The members of the board also scrutinized and updated the panel of examiners and recommended the panel of examiners for the B.TECH -EEE (FT/PT) & M.TECH - Power System (FT/PT), and submitted the same for the Academic Council for its approval.


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Vairam, Thanjavur-613 403.

The meeting was concluded with thanks from the Chairman.

Signature:

Chair/HoD:

Dept.: EEE

Name: Dr. P. Avirajamanjula

Date: 10.05.2022

Signature:

Dean:

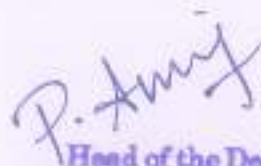
School: Engineering and Technology

Name:

Date: 10.05.2022

Enc:

1. Annexure – I: B. Tech (PT) – EEE
2. Annexure – II: M. Tech (FT / PT) – Power System



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ANNEXURE-I:

B.TECH (EEE) – Part Time

ITEM 1: The board members suggested to redesign the course of 22153C13P- Circuit Theory with updating the all 5 units of 19153C13P Circuit Analysis and Networks subject in I semester.

ITEM 2: The course “22153C22P-Optimization Techniques” is included in I semester to acquire the basic knowledge of different optimization methods instead of the course 19153C22P Computer Architecture.

ITEM 3: The board members proposed that the new course 22153C32P Linear Integrated Circuits and Applications can be added in the syllabus instead of 19153C32P Analog Integrated Circuits which enhance the student knowledge about the function and application of digital and analog ICs.

ITEM 4: The board members suggested to introduce a lab course 22153L35P DC and AC Electrical Machines Laboratory, and it is revised to understand the operation and characteristics of DC and AC electrical machines.

ITEM 5: A lab course “22153L45P Control and Instrumentation Laboratory” is introduced instead of “19153L45P Control System & Measurements Lab” according to the board members recommendation.

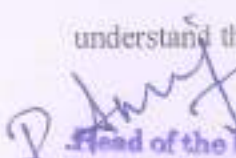
ITEM 6: The board members suggested to introduce a course “22153E44AP- Electromagnetic Theory” instead of “19153E44_P Field Theory”, to obtain a better knowledge in the electromagnetic fields area.


ITEM 7: The board members recommended a course 22153E54CP VLSI Design to include in the elective subjects instead of 19153E54CP Communication Engineering to gain knowledge of VLSI design.

ITEM 8: It is proposed by board members that 22153E64BP Micro Electro Mechanical Systems-this new course is introduced instead of 19153E64BP Professional Ethics to obtain knowledge in micro electro mechanical systems.

ITEM 9: The members proposed that a new course “22153E74CP Fundamentals of Nanoscience” to be introduced instead of “19153E74CP-Fiber Optics and Laser Instruments” to understand the basics of nanoscience and its applications.

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B. Tech (PT) EEE R 2022

Semester I

Sl. No	Subject Code	Subject Name	Periods Per Week			C
			L	T	P	
1	22148S11P	Transforms and Partial Differential Equations	3	1	0	4
2	22153C12P	Control System	3	1	0	4
3	22153C13P	Circuit Theory	3	1	0	3
4	22153C14P	Electronic circuits	3	0	0	3
5	22153C15P	Electrical Machines-I	4	0	0	4
Total No of Credits						22

Semester II

S. No	Subject Code	Subject Name	Periods Per Week			C
			L	T	P	
1	22148S21P	Numerical Methods	3	1	0	4
2	22153C22P	Optimization Techniques	3	0	0	3
3	22153C23P	Electrical Machines-II	3	1	0	4
4	22153C24P	Digital Electronics	3	1	0	4
5	22153C25P	Transmission and Distribution	4	0	0	4
Total No of Credits						22

Semester III

S. No	Subject Code	Subject Name	Periods Per Week			C
			L	T	P	
1	22148S31CP	Probability and Statistics	3	1	0	4
2	22153C32P	Linear Integrated Circuits and Applications	3	1	0	4
3	22153C33P	Power Electronics	4	0	0	4
4	22153C34P	Measurements and Instrumentation	4	0	0	4
5	22153L35P	DC and AC Electrical Machines Laboratory	0	0	3	2
Total No of Credits						18

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Semester IV

S. No	Subject Code	Subject Name	Periods Per Week			C
			L	T	P	
1	22153C41P	Protection and switchgear	4	0	0	4
2	22153C42P	High Voltage DC Transmission	3	1	0	4
3	22153C43P	Solid State Drives	3	1	0	4
4	22153E44_P	Elective -I	4	0	0	4
5	22153L45P	Control and Instrumentation Laboratory	0	0	3	2
Total No of Credits						18

Semester V

S. No	Subject Code	Subject Name	Periods Per Week			C
			L	T	P	
1	22153C51P	Power System Analysis	3	1	0	4
2	22153C52P	Power Quality	3	1	0	4
3	22153C53P	Special Electrical Machines	4	0	0	4
4	22153E54_P	Elective -II	4	0	0	4
5	22153L55P	Power Electronics and Drives Lab	0	0	3	2
Total No of Credits						18

Semester VI

S. No	Subject Code	Subject Name	Periods Per Week			C
			L	T	P	
1	22153C61P	Utilization of Electrical Energy	3	1	0	4
2	22153C62P	Solid State Relays	4	0	0	4
3	22153C63P	Power System Operation and Control	4	0	0	4
4	22153E64_P	Elective -III	4	0	0	4
5	22153L65P	Power Systems Lab	0	0	3	2
Total No of Credits						18

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Semester VII

S. No	Subject Code	Subject Name	Periods Per Week			C
			L	T	P	
1	22160S71P	Total Quality Management	3	0	0	3
2	22153C72P	Electrical Machine Design	3	1	0	4
3	22153C73P	Power Plant Engineering	4	0	0	4
4	22153E74_P	Elective -IV	3	0	0	3
5	22153P75P	Project Work	0	0	12	6
Total No of Credits						20

List of electives

ELECTIVE -I (IV SEMESTER)

S. No	Subject Code	Subject Name	Periods Per Week			C
			L	T	P	
1	22153E44AP	Electromagnetic Theory	4	0	0	4
2	22153E44BP	Fuzzy Logic and its applications	4	0	0	4
3	22153E44CP	Deep learning	4	0	0	4
4	22153E44DP	Modeling and Simulation of Solar Energy Systems	4	0	0	4
5	22153E44EP	Electronics equipment integration and prototype building	4	0	0	4

ELECTIVE -II (V SEMESTER)

S. No	Subject Code	Subject Name	Periods Per Week			C
			L	T	P	
1	22153E54AP	Environmental Science and Engineering	4	0	0	4
2	22153E54BP	Artificial Neural Networks	4	0	0	4
3	22153E54CP	VLSI Design	4	0	0	4
4	22153E54DP	Micro sensor	4	0	0	4
5	22153E54EP	Fundamentals of Power Electronics	4	0	0	4

ELECTIVE –III (VI SEMESTER)

S. No	Subject Code	Subject Name	Periods Per Week			C
			L	T	P	
1	22153E64AP	Principles of Management	4	0	0	4
2	22153E64BP	Micro Electro Mechanical Systems	4	0	0	4
3	22153E64CP	Integrated opto-Electronic Devices	4	0	0	4
4	22153E64DP	Control engineering	4	0	0	4
5	22153E64EP	Linear dynamic systems	4	0	0	4

ELECTIVE –IV (VII SEMESTER)

S. No	Subject Code	Subject Name	Periods Per Week			C
			L	T	P	
1	22153E74AP	Power system transients	3	0	0	3
2	22153E74BP	BHV AC and DC Transmission systems	3	0	0	3
3	22153E74CP	Fundamentals of Nanoscience	3	0	0	3
4	22153E74DP	Advanced Control systems	3	0	0	3
5	22153E74EP	Microwave integrated circuits	3	0	0	3

COURSE STRUCTURE AND CREDITS DISTRIBUTION

Sem.	Core Courses				Elective Courses		Total Credits
	Theory Courses		Practical Courses		Nos.	Credits	
	Nos.	Credits	Nos.	Credits			
I	05	19	-	-	-	-	19
II	05	19	-	-	-	-	19
III	04	16	01	02	-	-	18
IV	03	12	01	02	01	04	18
V	03	12	01	02	01	04	18
VI	03	12	01	02	01	04	18
VII	03	11	01	06	01	03	20
Total Credits							130

P. Anuj

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22153C13P- CIRCUIT THEORY

3 1 0 3
SEMESTER-I

AIM

To know about basic analysis and synthesis techniques used in electronics and communications.

OBJECTIVES

- To introduce electric circuits and its analysis
- To impart knowledge on solving circuits using network theorems
- To introduce the phenomenon of resonance in coupled circuits.
- To educate on obtaining the transient response of circuits.
- To Phasor diagrams and analysis of three phase circuits

UNIT-I BASIC CIRCUITS ANALYSIS (9)

Ohm's Law – Kirchoffs laws – DC and AC Circuits – Resistors in series and parallel circuits – Mesh current and node voltage method of analysis for D.C and A.C. circuits – Phasor Diagram – Power, Power Factor and Energy.

UNIT-II NETWORK REDUCTION AND NETWORK THEOREMS FOR DC AND AC CIRCUITS (9)

Network reduction: voltage and current division, source transformation – star delta conversion. Thevenins and Norton & Theorem – Superposition Theorem – Maximum power transfer theorem – Reciprocity Theorem.

UNIT-III RESONANCE AND COUPLED CIRCUITS (9)

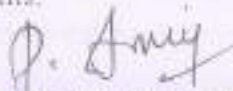
Series and parallel resonance – their frequency response – Quality factor and Bandwidth - Self and mutual inductance – Coefficient of coupling – Tuned circuits – Single tuned circuits.

UNIT-IV TRANSIENT RESPONSE FOR DC CIRCUITS (9hrs)

Transient response of RL, RC and RLC Circuits using Laplace transform for DC input and A.C. with sinusoidal input – Characterization of two port networks in terms of Z, Y and h parameters.

UNIT-V THREE PHASE CIRCUITS (9hrs)

Three phase balanced / unbalanced voltage sources – analysis of three phase 3-wire and 4-wire circuits with star and delta connected loads, balanced & un balanced – phasor diagram of voltages and currents – power and power factor measurements in three phase circuits.


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22153C22P - OPTIMISATION TECHNIQUES

**3003
SEMESTER II**

AIM:

To understand the architecture of different optimization techniques and its applications

OBJECTIVES:

To provide a clear understanding of

- To introduce the basic concepts of linear programming
- To educate on the advancements in Linear programming techniques
- To introduce non-linear programming techniques
- To introduce the interior point methods of solving problems
- To introduce the dynamic programming method

UNIT I LINEAR PROGRAMMING

9

Introduction - formulation of linear programming model-Graphical solution-solving LPP using simplex algorithm – Revised Simplex Method

UNIT II ADVANCES IN LPP

9

Dual theory- Dual simplex method - Sensitivity analysis--Transportation problems-Assignment problems-Traveling sales man problem -Data Envelopment Analysis.

UNIT III NON LINEAR PROGRAMMING

9

Classification of Non Linear programming – Lagrange multiplier method – Karush – Kuhn Tucker conditions-Reduced gradient algorithms-Quadratic programming method – Penalty and Barrier method.

UNIT IV INTERIOR POINT METHODS

9

Karmarkar's algorithm-Projection Scaling method-Dual affine algorithm-Primal affine algorithm Barrier algorithm.

UNIT V DYNAMIC PROGRAMMING

9

Formulation of Multi stage decision problem-Characteristics-Concept of sub-optimization and the principle of optimality-Formulation of Dynamic programming-Backward and Forward recursion- Computational procedure-Conversion of final value problem in to Initial value problem.

TOTAL: 45 PERIODS

COURSE OUTCOMES

- To understand ethical issues, environmental impact and acquire management skills.

TEXT BOOKS

1. Hillier and Lieberman "Introduction to Operations Research", TMH, 2000.
2. R.Panneerselvam. "Operations Research", PHI, 2006.
3. Handy A.Taha, "Operations Research –An Introduction", Prentice Hall India, 2007.

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22153C32P- LINEAR INTEGRATED CIRCUITS AND APPLICATIONS

3 1 0 4

AIM

To introduce the concepts for realizing functional building blocks in ICs, fabrications & application of ICs.

OBJECTIVES

- To study the IC fabrication procedure.
- To study characteristics; realize circuits; design for signal analysis using
- To study the applications of Op-amp.
- To study internal functional blocks and the applications of special ICs like circuits, regulator Circuits, ADCs.

UNIT I: IC FABRICATION

9

IC classification, fundamental of monolithic IC technology, epitaxial growth, masking and etching, diffusion of impurities. Realisation of monolithic ICs and packaging. Fabrication of diodes, capacitance, resistance and FETs.

UNIT II: CHARACTERISTICS OF OPAMP

9

Ideal OP-AMP characteristics, DC characteristics, AC characteristics, differential amplifier, frequency response of OP-AMP, Basic applications of op-amp – Inverting and Non-inverting Amplifiers-V/I & I/V converters, summer, differentiator and integrator.

UNIT III: APPLICATIONS OF OPAMP

9

Instrumentation amplifier, Log and Antilog Amplifiers, first and second order active filters, comparators, multivibrators, waveform generators, clippers, clampers, peak detector, S/H circuit, D/A converter (R- 2R ladder and weighted resistor types), A/D converters using opamps.

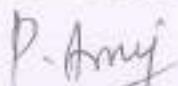
UNIT IV: SPECIAL ICs

9

Functional block, characteristics & application circuits with 555 Timer Ic-566 voltage controlled oscillator Ic, 565-phase lock loop Ic, Analog multiplier ICs.

UNIT V: APPLICATION ICs

9



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IC voltage regulators –LM78XX,79XX Fixed voltage regulators - LM317, 723 Variable voltage regulators; switching regulator- SMPS- LM 380 power amplifier- ICL 8038 function generator IC.

TOTAL = 45

COURSE OUTCOMES

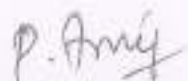
- Ability to understand and analyse, linear and digital electronic circuits.

TEXT BOOKS

1. David A.Bell, 'Op-amp & Linear ICs', Oxford, 2013.
2. D.Roy Choudhury, Sheil B.Jani, 'Linear Integrated Circuits', II edition, New Age, 2003.
3. Ramakant A.Gayakward, 'Op-amps and Linear Integrated Circuits', IV edition, Pearson Education, 2003 / PHI. 2000.

REFERENCE BOOKS

1. Fiore, 'Opamps & Linear Integrated Circuits Concepts & Applications', Cengage, 2010.
2. Floyd, Buchla, 'Fundamentals of Analog Circuits, Pearson, 2013.
3. Jacob Millman, Christos C.Halkias, 'Integrated Electronics - Analog and Digital circuits system', Tata McGraw Hill, 2003.
4. Robert F.Coughlin, Fredrick F. Driscoll, 'Op-amp and Linear ICs', PHI Learning, 6th edition, 2012.



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**22153L35P- DC AND AC ELECTRICAL MACHINES
LABORATORY**

0 0 3 2

Semester III

OBJECTIVES:

- To impart hands on experience in verification of circuit laws and theorems, measurement of circuit parameters, study of circuit characteristics and simulation of time response.
- To expose the students to the basic operation of electrical machines and help them to develop experimental skills.

LIST OF EXPERIMENTS

1. Open circuit characteristics of D.C. shunt generator.
2. Load characteristics of D.C. shunt generator.
3. Load test on D.C. shunt and Compound Motor.
4. Load test on D.C. series motor.
5. Swinburne's test and speed control of D.C. shunt motor.
6. Hopkinson's test on D.C. motor generation set.
7. Load test on single phase and three phase transformer
8. open circuit and short circuit tests on single phase and three phase transformer (Determination of equivalent circuit parameters).
9. Load test on single phase induction motor.
10. No load and blocked rotor tests on three phase induction motor (Determination of equivalent circuit parameters)
11. Load test on Three phase induction motor.
12. Study of Starters

TOTAL: 45

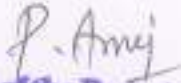
COURSE OUTCOMES

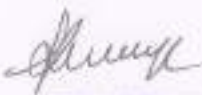
At the end of the course, the student should have the :

- Ability to conduct performance tests on DC and AC machines
- Ability to understand and analyze EMF and MMF methods
- Ability to analyze the characteristics of V and Inverted V curves
- Ability to understand the importance of Synchronous machines.
- Ability to understand the importance of Induction Machines

LIST OF EQUIPMENT FOR A BATCH OF 30 STUDENTS:

1. DC Shunt Motor with Loading Arrangement – 3 nos
2. Single Phase Transformer – 4 nos
3. DC Series Motor with Loading Arrangement – 1 No.


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AIM

To provide knowledge on analysis and design of control and instrumentation

LIST OF EXPERIMENTS**CONTROLSYSTEMS:**

1. P, PI and PID controllers
2. Stability Analysis
3. Modeling of Systems – Machines, Sensors and Transducers
4. Design of Lag, Lead and Lag-Lead Compensators
5. Position Control Systems
6. Synchro-Transmitter- Receiver and Characteristics
7. Simulation of Control Systems by Mathematical development tools.

INSTRUMENTATION:

8. Bridge Networks –AC and DC Bridges
9. Dynamics of Sensors/Transducers
 - a. Temperature
 - b. Pressure
 - c. Displacement
 - d. Optical
 - e. Strain, etc.
10. Power and Energy Measurement
11. Signal Conditioning
 - a. Instrumentation Amplifier
 - b. Analog – Digital and Digital –Analog converters (ADC and DACs)
12. Process Simulation.

P = 45

Total = 45**COURSE OUTCOMES**

Ability to understand and apply basic science, circuit theory, Electro-magnetic field theory control theory and apply them to electrical engineering problems.

LIST OF EQUIPMENT FOR A BATCH OF 30 STUDENTS:**CONTROLSYSTEMS:**

1. PID kit – 1 No.
- DSO – 1 No.
- CRO Probe – 2 nos
- Personal computers
3. DC motor – 1 No.
- Generator – 1 No. Rheostats – 2 nos
- Ammeters Voltmeters

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22153C51P-POWER SYSTEM ANALYSIS

AIM

To become familiar with different aspects of modeling of power systems and different methods of analysis of power system planning and operation.

OBJECTIVES

- To model steady-state operation of large-scale power systems and power flow problems using efficient numerical methods suitable for power systems.
- To model and analyse power systems under abnormal (fault) conditions.
- To model and analyse the dynamics of power system and design the systems for enhancing stability.

UNIT I- THE POWER SYSTEM AN OVER VIEW AND MODELING

Modern Power System - Basic Components of a power system - Generator model - Transformer model - line model. The per unit system.

UNIT II- POWER FLOW ANALYSIS

Introduction - Bus Classification - Bus admittance matrix - Algebraic equations - Gauss seidal method - Newton raphson method - Flow starts and comparison of the three methods.

UNIT III-FAULT ANALYSIS-BALANCED FAULT

Introduction - Balanced three phase fault - short circuit analysis using bus impedance matrix - algorithm for formation of bus impedance matrix.

UNIT IV-FAULT ANALYSIS - SYMMETRICAL UNBALANCED FAULT

Introduction - Fundamentals of symmetrical components - sequence networks - single line to ground fault - line fault - Double line to ground fault analysis using bus impedance matrix.

UNIT V-POWER SYSTEM STABILITY

Dynamics of a Synchronous machine - Swing equation and Power angle stability - Steady state Stability and Transient state Stability - Equal area criterion and time- Numerical solution of Swing equation for single machine.

Total = 60 Hrs

COURSE OUTCOMES

- Ability to model the power system under steady state operating conditions.
- Ability to understand and apply iterative techniques for power flow analysis.
- Ability to model and carry out short circuit studies on power system.
- Ability to model and analyze stability problems in power system.

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M.TECH(Power Systems)-Full Time

ITEM 1: The course title "19248S11D Applied Mathematics for Electrical & Electronics Engineering" is modified as "22248S11D-Applied Mathematics for Power System Engineering" from the existing 2019 curriculum in the semester I.

ITEM 2: The board members suggested that a new course "22272C13 Advanced Power System Analysis" is to be included instead of "19272C13 Power System Modeling and Analysis" which may develop the knowledge about the power system faults and its solution techniques.

ITEM 3: The board members suggested to rename the course title "22272C14 Economic Operations of Power Systems" instead of "19272C14 Economic Operations of Power Systems-I" from the existing 2019 curriculum.

ITEM 4: The course "19272C15-High Voltage Direct Current Transmission System is modified as "22272C15 HVDC and FACTS" with including the concept of FACT devices based on the board members suggestion in I semester.

ITEM 5: The board members suggested to introduce a lab course 22272L17 Power System Simulation Laboratory instead of 19272L17 Power System Simulation Lab-I in semester I with addition of new experiments.

ITEM 6: The course "19272C22 Economic Operations of Power Systems-II is retitled as "22272C22 Power System Control" with board members recommendation.

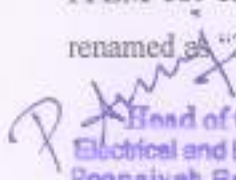
ITEM 7: The board members suggested that a new course "22272C23 Advanced Power System Protection" is to be introduced with the revision of course content "19272C23 Power System Protection" in the same semester.

ITEM 8: The board members suggested to introduce a lab course "22272L26 Advanced Power System Simulation Laboratory" instead of "19272L26 Power System Simulation Lab-II".

ITEM 9: The board members are suggested a new course "22272E16D Analysis and Computation of Electromagnetic Transients in Power Systems" instead of "19272E16D Design of Substations" to acquire the deep knowledge about the impact of transients in the power system network.

ITEM 10: The course title "19272E33B Power System restructuring and deregulation" has been renamed as "22272E33B Deregulated Power System" from the existing 2019 curriculum.

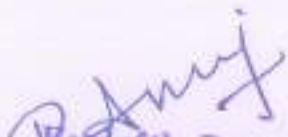
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ITEM 11: A new course "22272E33D Principles of EHV Transmission is introduced instead of 19272E33D Advanced Digital Signal Processing with the recommendations of board members.

ITEM 12: A few research and boundary Courses "19272CRS-Research Led Seminar, 19272CRM-Research, Methodology, 19272CBR-Participation in Bounded Research and 19272CSR-Design / Socio Technical Project" are eliminated from the existing 2019 syllabus with the suggestion of board members in the semester I, II and III respectively.


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SEMESTER - I

SL.NO.	SUBJECT CODE	SUBJECT	L	T	P	C
1.	22248S11D	Applied Mathematics For Power System Engineering	3	1	0	4
2	22272C12	System Theory	3	1	0	4
3	22272C13	Advanced Power System Analysis	3	1	0	4
4	22272C14	Economic Operations of Power Systems	3	1	0	4
5	22272C15	HVDC and FACTS	3	1	0	4
6	22272E16	Elective-I	3	0	0	3
7	22272L17	Power System Simulation Laboratory	0	0	3	3
TOTAL						26

SEMESTER - II

SL. NO.	SUBJECT CODE	SUBJECT	L	T	P	C
1	22272C21	EHV power transmission	3	1	0	4
2	22272C22	Power System Control	3	1	0	4
3	22272C23	Advanced Power System Protection	3	1	0	4
4	22272E24	Elective -II	3	0	0	3
5	22272E25	Elective -III	3	0	0	3
6	22272L26	Advanced Power System Simulation Laboratory	0	0	3	3
7	222TECWR	Technical Writing/Seminars	0	0	3	3
TOTAL						24

SEMESTER - III

SL. NO.	SUBJECT CODE	SUBJECT	L	T	P	C
1	22272C31	Electrical Transients in power systems	3	1	0	4
2	22272E32	Elective -IV	3	0	0	3
3	22272E33	Elective -V	3	0	0	3
4	22272E34	Elective -VI	3	0	0	3
5	22272P35	Project work Phase-I	0	0	10	10
TOTAL						23

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SEMESTER – IV

SL.NO.	SUBJECT CODE	SUBJECT	L	T	P	C
1	22272P41	Project work Phase-II	0	0	15	15

Total Credits = 88

Elective –I

SL.NO.	SUBJECT CODE	SUBJECT	L	T	P	C
1	22272E16A	Analysis of Inverters	3	0	0	3
2.	22272E16B	Modeling and Analysis of Electrical Machines	3	0	0	3
3.	22272E16C	Advanced Power System Dynamics	3	0	0	3
4.	22272E16D	Analysis and Computation of Electromagnetic Transients in Power Systems	3	0	0	3

Elective –II

SL.NO.	SUBJECT CODE	SUBJECT	L	T	P	C
1	22272E24A	Smart Grid	3	0	0	3
2.	22272E24B	Solar and Energy Storage Systems	3	0	0	3
3.	22272E24C	Design of power electronic converters	3	0	0	3
4.	22272E24D	Design and analysis of VLSI subsystems	3	0	0	3

Elective –III

SL.NO.	SUBJECT CODE	SUBJECT	L	T	P	C
1	22272E25A	Wind Energy conversion systems	3	0	0	3
2.	22272E25B	AI Techniques to Power Systems	3	0	0	3
3.	22272E25C	Sensors and actuators	3	0	0	3
4.	22272E25D	Power quality improvement techniques	3	0	0	3

Elective –IV

SL.NO.	SUBJECT CODE	SUBJECT	L	T	P	C
1	22272E32A	Power Electronics applications in Power systems	3	0	0	3

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2.	22272E32B	Power system Dynamics	3	0	0	3
3.	22272E32C	Foundation of wavelets and multirate digital signal processing	3	0	0	3
4.	22272E32D	Fuzzy sets, logic and systems and application	3	0	0	3

Elective -V

SL.NO.	SUBJECT CODE	SUBJECT	L	T	P	C
1	22272E33A	Power Conditioning	3	0	0	3
2.	22272E33B	Deregulated Power System	3	0	0	3
3.	22272E33C	Control System Design for Power Electronics	3	0	0	3
4.	22272E33D	Principles of EHV Transmission	3	0	0	3

Elective -VI

SL.NO.	SUBJECT CODE	SUBJECT	L	T	P	C
1	22272E34A	Software for Control system Design	3	0	0	3
2.	22272E34B	Industrial Power system analysis and design	3	0	0	3
3.	22272E34C	Power management integrated circuits	3	0	0	3
4.	22272E34D	RF and microwave networks	3	0	0	3

Credit Distribution

Sem.	Core Courses				Elective Courses		Total Credits
	Theory Courses		Practical Courses		Nos.	Credits	
	Nos.	Credits	Nos.	Credits			
I	04	16	01	03	01	03	26
II	03	12	02	06	02	06	24
III	01	04	-	-	03	09	23
IV	-	-	-	-	-	-	15
Total Credits							88

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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

ACADEMIC YEAR 2022-2023

M. Tech FT New course list

S. No	Course Code	Course Name
1.	22272E32C	Foundation of wavelets and multirate digital signal processing
2.	22272E34C	Power management integrated circuits
3.	22272E34D	RF and microwave networks
4.	22272E32D	Fuzzy sets, logic and systems and application
5.	22272E25D	Power quality improvement techniques
6.	22272E25C	Sensors and actuators
7.	22272E24D	Design of power electronic converters
8.	22272E24E	Design and analysis of VLSI subsystems
9.	22272C13	Advanced Power System Analysis
10.	22272C15	HVDC and FACTS

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22248S11D - APPLIED MATHEMATICS for POWER SYSTEM ENGINEERING
ENGINEERING 3104

- | | | |
|----|--|---|
| 1. | ADVANCED MATRIX THEORY
Matrix norms – Jordan canonical form – Generalized eigenvectors – Singular value decomposition – Pseudo inverse – Least square approximations. | 9 |
| 2. | RANDOM PROCESSES
Random variable, discrete, continuous types - Binomial, Poisson, normal and exponential distributions density & distribution Functions- Moments Moment Generating Functions – Notion of stochastic processes - Auto-correlation – Cross correlation . | 9 |
| 3. | LINEAR PROGRAMMING
Basic concepts – Graphical and Simplex methods –Transportation problem – Assignment problem. | 9 |
| 4. | DYNAMIC PROGRAMMING
Elements of the dynamic programming model – optimality principle – Examples of dynamic programming models and their solutions. | 9 |
| 5. | INTEGRAL TRANSFORMS
Finite Fourier transform - Fourier series - Finite sine Transform - Cosine transform - finite Hankel transform - definition, Transform of df/dx where p is a root of $J_n(p) = 0$. Transform of | 9 |

$$\frac{d^2f}{dx^2} + \frac{1}{x} \frac{df}{dx}, \text{ and Transform of } \frac{d^2f}{dx^2} + \frac{1}{x} \frac{df}{dx} = \frac{a^2f}{x^2}$$

$$L = 45 \quad T = 15 \quad P = 0 \quad C = 4$$

REFERENCES

- Lewis, D.W., Matrix Theory, Allied Publishers, Chennai 1995.
- Bronson, R, Matrix Operations, Schaums outline Series, McGraw Hill, New York, 1989.
- Andrews, L.A., and Shivamoggi B.K., "Integral Transforms for Engineers and Applied Mathematicians", Macmillan, New York, 1988.
- Taha, H.A., "Operations research - An Introduction", Mac Millan publishing Co., (1982).
- Gupta, P.K. and Hira, D.S., "Operations Research", S.Chand & Co., New Delhi, (1999).
- Ochi, M.K. "Applied Probability and Stochastic Processes", John Wiley & Sons (1992).
- Peebles Jr., P.Z., "Probability Random Variables and Random Signal Principles, McGraw Hill Inc., (1993).

22272C13 - ADVANCED POWER SYSTEM ANALYSIS

3104

OBJECTIVES:

- To introduce different techniques of dealing with sparse matrix for large scale power systems.
- To impart in-depth knowledge on different methods of power flow solutions.
- To perform optimal power flow solutions in detail.
- To perform short circuit fault analysis and understand the consequence of different type of faults.
- To illustrate different numeric al integration methods and factors influencing transient stability

UNIT I SOLUTION TECHNIQUE

9

Sparse Matrix techniques for large scale power systems: Optimal ordering schemes for preserving sparsity. Flexible packed storage scheme for storing matrix as compact arrays –Factorization by Bifactorization and Gauss elimination methods; Repeat solution using Left and Right factors and L and U matrices.

UNIT II POWER FLOW ANALYSIS

9

Power flow equation in real and polar forms; Review of Newton's method for solution; Adjustment of P-V buses; Review of Fast Decoupled Power Flow method; Sensitivity factors for P-V bus adjustment.

UNIT III OPTIMAL POWER FLOW

9

Problem statement; Solution of Optimal Power Flow (OPF) – The gradient method, Newton's method, Linear Sensitivity Analysis; LP methods – With real power variables only – LP method with AC power flow variables and detailed cost functions; Security constrained Optimal Power Flow; Interior point algorithm; Bus Incremental costs.

UNIT IV SHORT CIRCUIT ANALYSIS

9

Formation of bus impedance matrix with mutual coupling (single phase basis and three phase basis)- Computer method for fault analysis using ZBUS and sequence components. Derivation of equations for bus voltages, fault current and line currents, both in sequence and phase – symmetrical and unsymmetrical faults.

UNIT V TRANSIENT STABILITY ANALYSIS

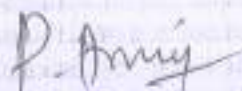
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Introduction, Numerical Integration Methods: Euler and Fourth Order Runge-Kutta methods. Algorithm for simulation of SMIB and multi-machine system with classical synchronous machine model; Factors influencing transient stability, Numerical stability, and implicit Integration methods.


$$L=45 \quad T=15 \quad P=0 \quad C=4$$

OUTCOMES:

- Ability to apply the concepts of sparse matrix for large scale power system analysis
- Ability to analyze power system studies that needed for the transmission system flow planning.



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22272C14- ECONOMIC OPERATIONS OF POWER SYSTEMS

3 1 0 4

1. INTRODUCTION 9

Planning and operational problems of power systems – review of economic dispatch and calculation using B matrix loss formula – use of participation factors in on line economic dispatch.

2. OPTIMAL POWER FLOW PROBLEM 9

Real and reactive power control variables – operation and security constraints and their limits – general OPF problem with different objective functions – formulation – cost loss minimization using Dommel and Tinney's method and SLP – development of model and algorithm – MVAR planning – optimal siting and sizing of capacitors using SLR method – interchange evaluation using SLP.

3. HYDRO THERMAL SCHEDULING 9

Problems definition and mathematical model of long and short term problems – discretization – dynamic and incremental dynamic programming – methods of local variation – hydro thermal system with pumped hydro units – solution by local variation treating pumped hydro unit for load management and spinning reserve.

4. UNIT COMMITMENT 9

Constraints in unit commitment – solution by priority list method – dynamic programming method – backward and forward – restricted search range.

5. MAINTENANCE SCHEDULING 9

Factors considered in maintenance scheduling for generating units – turbines – boilers – introduction to maintenance scheduling using mathematical programming.

$$L = 45 \quad T = 15 \quad P = 0 \quad C = 4$$

REFERENCES

1. Allen J.Wood and Bruce F.Wollenberg, "Power generation and control", John Wiley & Sons, New York, 1984.
2. Krichmayer L., "Economic operation of power systems", John Wiley and sons Inc, New York, 1958.
3. Krichmayer L.K, "Economic control of Interconnected systems", Jhon Wiley and sons Inc, New York, 1959.
4. Elgerd O.E, "Electric energy systems theory – an introduction", McGraw Hill New Delhi, 1971.

5. MAINTENANCE SCHEDULING 9

Factors considered in maintenance scheduling for generating units – turbines – boilers – introduction to maintenance scheduling using mathematical programming.

REFERENCES

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22272C15- HVDC AND FACTS

3 1 0 4

OBJECTIVES:

- To emphasize the need for FACTS controllers.
- To learn the characteristics, applications and modeling of series and controllers.
- To analyze the interaction of different FACTS controller and coordination
- To impart knowledge on operation, modelling and control of HVDC link.
- To perform steady state analysis of AC/DC system.

UNIT I INTRODUCTION

9

Review of basics of power transmission networks-control of power flow in AC transmission line- Analysis of uncompensated AC Transmission line- Passive reactive power compensation: Effect of series and shunt compensation at the mid-point of the line on power transfer- Need for FACTS controllers- types of FACTS controllers. Comparison of AC & DC Transmission, Applications of DC Transmission Topologies.

UNIT II SVC & STATCOM

9

Configuration of SVC- voltage regulation by SVC- Modelling of SVC for load flow analysis-Design of SVC to regulate the mid-point voltage of a SMIB system- Applications Static synchronous compensator (STATCOM)- Operation of STATCOM - Voltage regulation - Power flow control with STATCOM.

UNIT III TCSC and SSSC

9

Concepts of Controlled Series Compensation- Operation of TCSC - Analysis of TCSC operation - Modelling of TCSC for load flow studies - Static synchronous series compensator (SSSC)- Operation of SSSC - Modelling of SSSC for power flow - operation of Unified power flow controllers(UPFC)

UNIT IV ANALYSIS OF HVDC LINK

9

Simplified analysis of six pulse Graetz bridge - Characteristics - Analysis of converter operations - Commutation overlap - Equivalence circuit of bipolar DC transmission link - Modes of operation - Mode ambiguity - Different firing angle controllers - Power flow control.

UNIT V POWER FLOW ANALYSIS IN AC/DC SYSTEMS

9

Per unit system for DC Quantities - Modelling of DC links - Solution of DC load flow - Solution of AC-DC power flow - Unified and Sequential methods.

TOTAL : 45 PERIODS**OUTCOMES:**

- Learners will be able to refresh on basics of power transmission networks and need for FACTS controllers
- Learners will understand the significance about different voltage source converter based FACTS controllers
- Learners will understand the significance of HVDC converters and HVDC system control
- Learners will attain knowledge on AC/DC power flow analysis

REFERENCES

L. Mohan Mathur, R. Rajiv. K. Varma, "Thyristor - Based Facts Controllers for Electrical Transmission Systems"; IEEE press and John Wiley & Sons, Inc.

2. K.R.Padiyar, "FACTS Controllers in Power Transmission and Distribution", New Age International (P) Ltd., Publishers, New Delhi, Reprint 2008.
3. K.R.Padiyar, "HVDC Power Transmission Systems", New Age International (P) Ltd., New Delhi, 2002.
4. J.Arrillaga, "High Voltage Direct Current Transmission", Peter Pregrinus, London, 1983.
5. V.K.Sood, "HVDC and FACTS controllers- Applications of Static Converters in Power System", Kluwer Academic Publishers 2004

2. K.R.Padiyar, "FACTS Controllers in Power Transmission and Distribution", New Age International (P) Ltd., Publishers, New Delhi, Reprint 2008.

3. K.R.Padiyar, "HVDC Power Transmission Systems", New Age International (P) Ltd., New Delhi, 2002.

4. J.Arrillaga, "High Voltage Direct Current Transmission", Peter Pregrinus, London, 1983.

5. V.K.Sood, "HVDC and FACTS controllers- Applications of Static Converters in Power System", Kluwer Academic Publishers 2004

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22272L17- POWER SYSTEM SIMULATION LABORATORY 0033

OBJECTIVES:

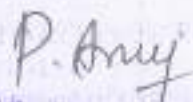
- To have hands on experience on various system studies and different techniques used
- for system planning using Software packages
- To perform the dynamic analysis of power system

LIST OF EXPERIMENTS

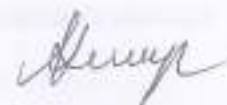
1. Power flow analysis by Newton-Raphson method and Fast decoupled method
2. Transient stability analysis of single machine-infinite bus system using classical machine model
3. Contingency analysis: Generator shift factors and line outage distribution factors
4. Economic dispatch using lambda-iteration method
5. Unit commitment: Priority-list schemes and dynamic programming
6. State Estimation (DC)
7. Analysis of switching surge using EMTP: Energisation of a long distributed- parameter line
8. Analysis of switching surge using EMTP: Computation of transient recovery voltage
9. Simulation and Implementation of Voltage Source Inverter
10. Digital Over Current Relay Setting and Relay Coordination using Suitable software packages
11. Co-ordination of over-current and distance relays for radial line protection

TOTAL: 60 PERIODS**OUTCOMES:**

- Upon Completion of the course, the students will be able to:
- Analyze the power flow using Newton-Raphson method and Fast decoupled method.
- Perform contingency analysis & economic dispatch
- Set Digital Over Current Relay and Coordinate Relay



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22272C22

POWER SYSTEM CONTROL

3 1 0 4

1. AUTOMATIC GENERATION CONTROL 9

Plant and system level control problem – ALFC of single area system modeling state and transient response – EDC control loop – ALFC of multi area system – modeling – static and transient response of two area system development of state variable model – two area system – AGC system design Kalman's method.

2. AUTOMATIC VOLTAGE CONTROL 9

Modeling of AVR loop – components – dynamic and static analysis – stability compensation – system level voltage control using OLTC, capacitor and generator voltages – expert system application for system voltage control.

3. SECURITY CONTROL CONCEPT 9

System operating states by security control functions – monitoring evaluation of system state by contingency analysis – corrective controls (preventive, emergency and restorative) – islanding scheme.

4. STATE ESTIMATION 9

Least square estimation – basic solution – sequential form of solution – static state estimation of power system by different algorithms – tracking state estimation of power system – computation consideration – external equivalency. Treatment of bad data and on line load flow analysis.

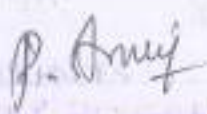
5. COMPUTER CONTROL OF POWER SYSTEM 9

Energy control center – various levels – national – regional and state level SCADA system – computer configuration – functions, monitoring, data acquisition and controls – EMS system – software in EMS system. Expert system applications for power system operation.

L = 45 T = 15 P = 0 C = 4

3. REFERENCES

1. Kundur P., "power system stability and control", McGraw Hill, 1994.
2. Anderson P.M., and Fouad A.A., "power system control and stability", Galgotia publication, New Delhi, 1981.
3. Taylor C.W., "power systems voltage stability", McGraw Hill, New Delhi, 1993.
4. IEEE recommended practice for excitation system models for power system stability studies, IEEE standard 421.5, 1992.
5. Kimbark E.W., "power system stability", Vol.3., Synchronous machines, John Wiley and sons, 1956.
6. T.Y Cistem, C.Vourmas, "voltage stability of power system", Kluwer Academic Publishers, 1998.
7. Elgerd O.L., "Electric energy systems theory – an introduction", McGraw Hill, New Delhi, 1971.


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22272C23- ADVANCED POWER SYSTEM PROTECTION

3.104

OBJECTIVES:

- To illustrate concepts of transformer protection
- To describe about the various schemes of Over current protection
- To analyze distance and carrier protection
- To familiarize the concepts of Generator protection and Numerical protection

UNIT I OVER CURRENT & EARTH FAULT PROTECTION

9

Zones of protection – Primary and Backup protection – operating principles and Relay Construction - Time – Current characteristics-Current setting – Time setting-Over current protective schemes –Concept of Coordination - Protection of parallel / ring feeders – Reverse power or directional relay –Polarisation Techniques – Cross Polarisation – Quadrature Connection -Earth fault and phase fault protection - Combined Earth fault and phase fault protection scheme - Phase fault protective - scheme directional earth fault relay - Static over current relays – Numerical over – current protection; numerical coordination example for a radial feeder

UNIT II TRANSFORMER & BUSBAR PROTECTION

9

Types of transformers –Types of faults in transformers- Types of Differential Protection – High Impedance – External fault with one CT saturation – Actual behaviors of a protective CT – Circuit model of a saturated CT - Need for high impedance – Disadvantages - Percentage Differential Bias Characteristics – Vector group & its impact on differential protection - Inrush phenomenon – Zero Sequence filtering – High resistance Ground Faults in Transformers – Restricted Earth fault Protection - Inter-turn faults in transformers – Incipient faults in transformers - Phenomenon of overfluxing in transformers – Transformer protection application chart. Differential protection of busbars external and internal fault - Supervisory relay-protection of three – Phase busbars – Numerical examples on design of high impedance busbar differential scheme –Biased Differential Characteristics – Comparison between Transformer differential & Busbar differential.

UNIT III DISTANCE AND CARRIER PROTECTION OF TRANSMISSION LINES

9

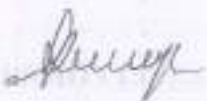
Drawback of over – Current protection – Introduction to distance relay – Simple impedance relay – Reactance relay – mho relays comparison of distance relay – Distance protection of a three – Phase line-reasons for inaccuracy of distance relay reach - Three stepped distance protection Trip contact configuration for the three - Stepped distance protection - Three-stepped protection of three-phase line against all ten shunt faults - Impedance seen from relay side - Three-stepped protection of double end fed lines-need for carrier – Aided protection – Various options for a carrier –Coupling and trapping the carrier into the desired line section - Unit type carrier aided directional comparison relaying – Carrier aided distance schemes for acceleration of zone II; numerical example for a typical distance protection scheme for a transmission line.

UNIT IV GENERATOR PROTECTION

9


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Winding Faults – Protection against Stator (earth) faults – third harmonic voltage protection – Rotor fault – Abnormal operating conditions - Protection against Rotor faults – Potentiometer Method – injection method – Pole slipping – Loss of excitation – Protection against Mechanical faults; Numerical examples for typical generator protection schemes

UNIT V NUMERICAL PROTECTION

Introduction–Block diagram of numerical relay - Sampling theorem- Correlation with a reference (LES) technique-Digital filtering-numerical over - Current protection- Numerical transformer differential protection-Numerical distance protection of transmission line

L = 45 T = 15 P = 0 C = 4

OUTCOMES:

- Learners will be able to understand the various schemes available in Transformer protection
- Learners will have knowledge on Overcurrent protection.
- Learners will attain knowledge about Distance and Carrier protection in transmission lines.
- Learners will understand the concepts of Generator protection.
- Learners will attain basic knowledge on substation automation.

REFERENCES

- 1 Y.G. Pathankar and S.R. Bhide, "Fundamentals of Power System Protection", Prentice-Hall of India, 2003
- 2 Badri Ram and D.N. Vishwakarma, "Power System Protection and Switchgear", Tata McGraw- Hill Publishing Company, 2002
- 3 T.S.M. Rao, "Digital Relay / Numerical relays", Tata McGraw Hill, New Delhi, 1989.
- 4 P.Kundur, "Power System Stability and Control", McGraw-Hill, 1993.

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- 3 T.S.M. Rao, "Digital Relay / Numerical relays", Tata McGraw Hill, New Delhi, 1989.
- 4 P.Kundur, "Power System Stability and Control", McGraw-Hill, 1993.

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Shruti

22272L26 ADVANCED POWER SYSTEM SIMULATION LABORATORY

LTPC

0042

OBJECTIVES:

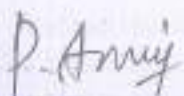
- To analyze the effect of FACTS controllers by performing steady state analysis.
- To have hands on experience on different wind energy conversion technologies.

LIST OF EXPERIMENTS

1. Small-signal stability analysis of single machine-infinite bus system using classical machine model
2. Small-signal stability analysis of multi-machine configuration with classical machine model
3. Induction motor starting analysis
4. Load flow analysis of two-bus system with STATCOM
5. Transient analysis of two-bus system with STATCOM
6. Available Transfer Capability calculation using an existing load flow program
7. Study of variable speed wind energy conversion system- DFIG
8. Study of variable speed wind energy conversion system- PMSG
9. Computation of harmonic indices generated by a rectifier feeding a R-L load
10. Design of active filter for mitigating harmonics

LIST OF EXPERIMENTS

1. Small signal stability analysis of single machine-infinite bus system using classical machine model
2. Small signal stability analysis of multi-machine configuration with classical machine model
3. Induction motor starting analysis
4. Load flow analysis of two-bus system with STATCOM
5. Transient analysis of two-bus system with STATCOM
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7. Study of variable speed wind energy conversion system- DFIG
8. Study of variable speed wind energy conversion system- PMSG
9. Computation of harmonic indices generated by a rectifier feeding a R-L load
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OBJECTIVES:

- To understand the various types of transients and its analysis in power system.
- To learn about modeling and computational aspects transients computation

UNIT I REVIEW OF TRAVELLING WAVE PHENOMENA 9

Lumped and Distributed Parameters - Wave Equation - Reflection, Refraction, Behaviour of Travelling waves at the line terminations - Lattice Diagrams - Attenuation and Distortion.

UNIT II LIGHTNING, SWITCHING AND TEMPORARY OVERVOLTAGES 9

Lightning overvoltages: interaction between lightning and power system- ground wire voltage and voltage across insulator; switching overvoltage: Short line or kilometric fault, energizing transients - closing and re-closing of lines, methods of control; temporary overvoltages: line dropping, load rejection; voltage induced by fault; very fast transient overvoltage (VFTO).

UNIT III PARAMETERS AND MODELING OF OVERHEAD LINES 9

Review of line parameters for simple configurations: series resistance, inductance and shunt capacitance; bundle conductors : equivalent GMR and equivalent radius; modal propagation in transmission lines: modes on multi-phase transposed transmission lines, α - β -0 transformation and symmetrical components transformation, modal impedances; analysis of modes on untransposed lines; effect of ground return and skin effect; transposition schemes;

UNIT V FAST TRANSIENTS PHENOMENON IN AIS AND GIS 9

Digital computation of line parameters: why line parameter evaluation programs? Salient features of a typical line parameter evaluation program; constructional features of that affect transmission line parameters; line parameters for physical and equivalent phase conductors elimination of ground wires bundling of conductors; principle of digital computation of transients: features and capabilities of electromagnetic transients program; steady state and time step solution modules: basic solution methods; case studies on simulation of various types of transients

TOTAL : 45 PERIODS**UNIT III PARAMETERS AND MODELING OF OVERHEAD LINES 9**

Review of line parameters for simple configurations: series resistance, inductance and shunt capacitance; bundle conductors : equivalent GMR and equivalent radius; modal

OUTCOMES:

- Learners will be able to model over head lines, cables and transformers.
- Learners will be able to analyze power system transients.

REFERENCES

- 1 Allan Greenwood, "Electrical Transients in Power System", Wiley & Sons Inc, New York, 1991.
- 2 R. Ramanujam, "Computational Electromagnetic Transients: Modeling, Solution Methods and Simulation", I.K. International Publishing House Pvt. Ltd, New Delhi, 2014.
- 3 Nandu M S and Kamaraju V, "High Voltage Engineering", Tata McGraw-Hill Publishing Company Ltd., New Delhi, 2004.

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22272E33B – DEREGULATED POWER SYSTEM

3104

1. FUNDAMENTALS AND ARCHITECTURE OF POWERMARKETS 9

Deregulation of Electric utilities: Introduction-Unbundling-Wheeling- Reform motivations- Fundamentals of Deregulated Markets – Types (Future, Day-ahead and Spot) – Participating in Markets (Consumer and Producer Perspective) – bilateral markets – pool markets. Independent System Operator (ISO)-components-types of ISO - role of ISO - Lessons and Operating Experiences of Deregulated Electricity Markets in various Countries (UK, Australia, Europe, US, Asia).

2. TECHNICAL CHALLENGES 9

Total Transfer Capability – Limitations - Margins – Available transfer capability (ATC) – Procedure - Methods to compute ATC – Static and Dynamic ATC – Effect of contingency analysis – Case Study. Concept of Congestion Management – Bid, Zonal and Node Congestion Principles – Inter and Intra zonal congestion – Generation Rescheduling - Transmission congestion contracts – Case Study.

3. TRANSMISSION NETWORKS AND SYSTEM SECURITY SERVICES 9

Transmission expansion in the New Environment – Introduction – Role of transmission planning – Physical Transmission Rights – Limitations – Flow gate- Financial Transmission Rights - Losses – Managing Transmission Risks – Hedging – Investment, Ancillary Services – Introduction – Describing Needs – Compulsory and Demand-side provision – Buying and Selling Ancillary Services – Standards.

4. MARKET PRICING 9

Transmission pricing in open access system – Introduction – Spot Pricing – Uniform Pricing – Zonal Pricing – Locational Marginal Pricing – Congestion Pricing – Ramping and Opportunity Costs. Embedded cost based transmission pricing methods (Passage stamp, Contract path and MW-mile) – Incremental cost based transmission pricing methods (Short run marginal cost, Long-run marginal cost) – Pricing of Losses on Lines and Nodes.

5. INDIAN POWER MARKET 9

1. TRANSMISSION NETWORKS AND SYSTEM SECURITY SERVICES
Current Scenario – Regions – Restructuring Choices – Statewise Operating Strategies – Salient features of Indian Electricity Act 2003 – Transmission System Operator – Regulatory and Policy development in Indian power Sector – Opportunities for IPP and Capacity Power Producers, Availability based tariff – Necessity – Working Mechanism – Beneficiaries – Day Scheduling Process – Deviation from Schedule – Unscheduled Interchange Rate – System Marginal Rate – Trading Surplus Generation – Applications.

4. MARKET PRICING

L = 45 T = 15 P = 0 C = 4

REFERENCES

1. Kankar Bhattacharya, Math H.J, Bollen and Jaap E. Daalder, "Operation of Restructured Power Systems", Kluwer Academic Publishers, 2001

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M.TECH (PART TIME)

ITEM 1: The course title "19248S11DP Applied Mathematics for Electrical & Electronics Engineering" is modified as "22248S11DP-Applied Mathematics for Power System Engineering" from the existing 2019 curriculum in the semester I.

ITEM 2: The board members suggested that a new course "22272C13P-Advanced Power System Analysis" is to be included instead of "19272C13P Power System Modeling and Analysis" which may develop the knowledge about the power system faults and its solution techniques.

ITEM 3: The board members suggested to introduce a lab course 22272L14P Power System Simulation Laboratory instead of 19272L14P Power System Simulation Lab-I in semester I with addition of new experiments.

ITEM 4: The board members suggested that a new course "22272C22P Advanced Power System Protection" is to be introduced with the revision of course content "19272C22P Power System Protection" in the same semester.

ITEM 5: The board members suggested to rename the course title "22272C31P- Economic Operations of Power Systems" instead of "19272C31P-Economic Operations of Power Systems-I" from the existing 2019 curriculum.

ITEM 6: The course "19272C32P-High Voltage Direct Current Transmission System is modified as "22272C32P-HVDC and FACTS" with including the concept of FACT devices based on the board members suggestion in I semester.

ITEM 7: The board members suggested to introduce a lab course "22272L34P- Advanced Power System Simulation Laboratory" instead of "19272L26-Power System Simulation Lab-II".

ITEM 8: The course "19272C41P-Economic Operations of Power Systems-II is retitled as "22272C41P-Power System Control" with board members recommendation.

ITEM 9: The board members are suggested a new course "22272E23DP-Analysis and Computation of Electromagnetic Transients in Power Systems" instead of "19272E23DP-Design of Substations" to acquire the deep knowledge about the impact of transients in the power system network.

ITEM 10: The course title "19275E52BP-Power System restructuring and deregulation" has been renamed as "22275E52BP-Deregulated Power System" from the existing 2019 curriculum.

ITEM 11: A new course “22275E52DP-Principles of Electric Power Transmission” is introduced instead of 19275E52DP-Advanced Digital Signal Processing with the recommendations of board members.

ITEM 12: The board members suggested to introduce the following new course Medical image analysis, Optical wireless communication, Physics of nanoscale devices, Introduction to information theory, IC design for wireless system, Facts devices, VLSI physical design with timing analysis.

ITEM 13: A few research and boundary Courses “19272CRSP-Research Led Seminar, 19272CRMP-Research Methodology, 19272CBRP-Participation in Bounded Research, 19272CSR-Design/ Socio Technical Project” are eliminated from the existing 2019 syllabus with the suggestion of board members in the semester I, II, and III respectively.

SEMESTER – I

SL.NO.	SUBJECT CODE	SUBJECT	L	T	P	C
1	22248S11DP	Applied Mathematics For Power System Engineering	3	1	0	4
2	22272C12P	System Theory	3	1	0	4
3	22272C13P	Advanced Power System Analysis	3	1	0	4
4	22272L14P	Power System Simulation Laboratory	0	0	3	3
TOTAL						15

SEMESTER – II

SL.NO.	SUBJECT CODE	SUBJECT	L	T	P	C
1	22272C21P	EHV power transmission.	3	1	0	4
2	22272C22P	Advanced Power System Protection	3	1	0	4
3	22272E23_P	Elective-I	3	0	0	3
4	222TECWRP	Technical Writing/Seminars	0	0	3	3
TOTAL						14

SEMESTER – III

SL.NO.	SUBJECT CODE	SUBJECT	L	T	P	C
1	22272C31P	Economic Operations of Power Systems	3	1	0	4
2	22272C32P	HVDC and FACTS	3	1	0	4
3	22272E33_P	Elective –II	3	0	0	3
4	22272L34P	Advanced Power System Simulation Laboratory	0	0	3	3
TOTAL						14

SEMESTER – IV

SL.NO.	SUBJECT CODE	SUBJECT	L	T	P	C
1	22272C41P	Power System Control	3	1	0	4
2	22272C42P	Electrical Transients in power systems	3	1	0	4

3	22272E43_P	Elective -III	3	0	0	3
4	22272P44P	Project work Phase -I	0	0	10	10
TOTAL						21

SEMESTER - V

SL.NO.	SUBJECT CODE	SUBJECT	L	T	P	C
1	22272E51_P	Elective -IV	3	0	0	3
2	22272E52_P	Elective -V	3	0	0	3
3	22272E53_P	Elective -VI	3	0	0	3
TOTAL						9

SEMESTER - VI

SL.NO.	SUBJECT CODE	SUBJECT	L	T	P	C
1	22272P61P	Project work Phase -II	0	0	15	15

Total Credits = 88

Elective -I

SL.NO.	SUBJECT CODE	SUBJECT	L	T	P	C
1	22272E23AP	Analysis and Design of Power Converters	3	0	0	3
2	22272E23BP	Modeling and Analysis of Electrical Machines	3	0	0	3
3	22272E23CP	Advanced Power System Dynamics	3	0	0	3
4	22272E23DP	Analysis and computation of Electromagnetic Transients in Power Systems	3	0	0	3

Elective -II

SL.NO.	SUBJECT CODE	SUBJECT	L	T	P	C
1	22272E33AP	Smart Grid	3	0	0	3
2	22272E33BP	Solar and Energy Storage Systems	3	0	0	3
3	22272E33CP	Power System Reliability	3	0	0	3
4	22272E33DP	Design and analysis of VLSI subsystems	3	0	0	3

Elective -III

SL.NO.	SUBJECT CODE	SUBJECT	L	T	P	C
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1	22272E43AP	Wind Energy conversion systems	3	0	0	3
2.	22272E43BP	AI Techniques to Power Systems	3	0	0	3
3.	22272E43CP	VLSI physical design with timing analysis	3	0	0	3
4.	22272E43DP	Facts devices	3	0	0	3

Elective -IV


SL.NO.	SUBJECT CODE	SUBJECT	L	T	P	C
1	22272E51AP	Power Electronics applications in Power systems	3	0	0	3
2.	22272E51BP	Power system Dynamics	3	0	0	3
3.	22272E51CP	IC design for wireless system	3	0	0	3
4.	22272E51DP	Introduction to information theory	3	0	0	3

Elective -V

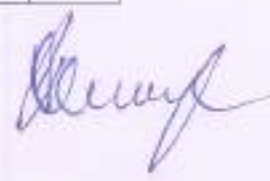
SL.NO.	SUBJECT CODE	SUBJECT	L	T	P	C
1	22275E52AP	Power Conditioning	3	0	0	3
2.	22275E52BP	Deregulated Power System	3	0	0	3
3.	22275E52CP	Physics of nanoscale devices	3	0	0	3
4.	22275E52DP	Principles of LHV Transmission	3	0	0	3

Elective -VI

SL.NO.	SUBJECT CODE	SUBJECT	L	T	P	C
1	22272E53AP	Software for Control system Design	3	0	0	3
2.	22272E53BP	Industrial Power system analysis and design	3	0	0	3
3.	22272E53CP	Optical wireless communication	3	0	0	3
4.	22272E53DP	Medical image analysis	3	0	0	3


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Credit Distribution

Sem.	Core Courses				Elective Courses		Total Credits
	Theory Courses		Practical Courses				
	Nos.	Credits	Nos.	Credits	Nos.	Credits	
I	02	08	01	03	-	-	15
II	02	08	01	03	01	03	14
III	02	08	01	03	01	03	14
IV	02	08	01	10	01	03	21
V	-	-	-	-	03	09	09
VI	-	-	01	15	-	-	15
Total Credits							88


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**SCHOOL OF ENGINEERING AND
TECHNOLOGY**

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

ACADEMIC YEAR 2022-2023

M. Tech PT New course list

S. No	Course Code	Course Name
1.	22272L14P	Power System Simulation Laboratory
2.	22272C22P	Advanced Power System Protection
3.	22272E33DP	Principles of EHV Transmission
4.	22272E53DP	Medical image analysis
5.	22272E53CP	Optical wireless communication
6.	22275E52CP	Physics of nanoscale devices
7.	22272E51DP	Introduction to information theory
8.	22272E51CP	IC design for wireless system
9.	22272E43DP	Facts devices
10.	22272E43CP	VLSI physical design with timing analysis
11.	22272C22P	Advanced Power System Protection
12.	22272C32P	HVDC and FACTS
13.	22272L34P	Advanced Power System Simulation Laboratory
14.	22272E23DP	Analysis and computation of Electromagnetic Transients in Power Systems
15.	22272E33DP	Design and analysis of VLSI subsystems

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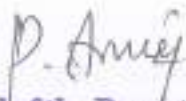
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DRGAN
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SYLLABUS

**22248S11DP-APPLIED MATHEMATICS FOR POWER SYSTEM
ENGINEERING**

3 1 0 4

- | | | |
|----|---|---|
| 1. | ADVANCED MATRIX THEORY | 9 |
| | Matrix norms – Jordan canonical form – Generalized eigenvectors – Singular value decomposition – Pseudo inverse – Least square approximations. | |
| 2. | RANDOM PROCESSES | 9 |
| | Random variable, discrete, continuous types - Binomial, Poisson, normal and exponential distributions density & distribution Functions- Moments Moment Generating Functions – Notion of stochastic processes - Auto-correlation – Cross correlation . | |
| 3. | LINEAR PROGRAMMING | 9 |
| | Basic concepts – Graphical and Simplex methods –Transportation problem – Assignment problem. | |
| 4. | DYNAMIC PROGRAMMING | 9 |
| | Elements of the dynamic programming model – optimality principle – Examples of dynamic programming models and their solutions. | |
| 5. | INTEGRAL TRANSFORMS | 9 |
| | Finite Fourier transform - Fourier series - Finite sine Transform - Cosine transform - finite Hankel transform - definition, Transform of $\frac{df}{dx}$ where μ is a root of $J_n(\mu) = 0$, Transform of | |
| | $\frac{d^2f}{dx^2} + \frac{1}{x} \frac{df}{dx}$ and Transform of $\frac{d^2f}{dx^2} + \frac{1}{x} \frac{df}{dx} - \frac{a^2f}{x^2}$ | |



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2222CI3P - ADVANCED POWER SYSTEM ANALYSIS

3 1 0 4

OBJECTIVES:

- To introduce different techniques of dealing with sparse matrix for large scale power systems.
- To impart in-depth knowledge on different methods of power flow solutions.
- To perform optimal power flow solutions in detail.
- To perform short circuit fault analysis and understand the consequence of different type of faults.
- To illustrate different numerical integration methods and factors influencing transient stability

UNIT I - SOLUTION TECHNIQUE

Sparse Matrix techniques for large scale power systems: Optimal ordering schemes for preserving sparsity. Flexible packed storage scheme for storing matrix as compact arrays - Factorization by Bifactorization and Gauss elimination methods; Repeat solution using Left and Right factors and L and U matrices.

UNIT II - POWER FLOW ANALYSIS

Power flow equation in real and polar forms; Review of Newton's method for solution; Adjustment of P-V buses; Review of Fast Decoupled Power Flow method; Sensitivity factors for P-V bus adjustment.

UNIT III - OPTIMAL POWER FLOW

Problem statement; Solution of Optimal Power Flow (OPF) - The gradient method, Newton's method, Linear Sensitivity Analysis; LP methods - With real power variables only - LP method with AC power flow variables and detailed cost functions; Security constrained Optimal Power Flow; Interior point algorithm; Bus Incremental costs.

UNIT IV - SHORT CIRCUIT ANALYSIS

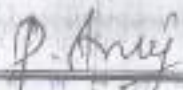
Formation of bus impedance matrix with mutual coupling (single phase basis and three phase basis)- Computer method for fault analysis using ZBUS and sequence components. Derivation of equations for bus voltages, fault current and line currents, both in sequence and phase - symmetrical and unsymmetrical faults.

UNIT V - TRANSIENT STABILITY ANALYSIS

Introduction, Numerical Integration Methods: Euler and Fourth Order Runge-Kutta methods, Algorithm for simulation of SMIB and multi-machine system with classical synchronous machine model; Factors influencing transient stability, Numerical stability and implicit Integration methods.

OUTCOMES:

- Ability to apply the concepts of sparse matrix for large scale power system analysis
- Ability to analyze power system studies that needed for the transmission system



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21272L14P- POWER SYSTEM SIMULATION LABORATORY

OBJECTIVES:

- To have hands on experience on various system studies and different techniques used
- for system planning using Software packages
- To perform the dynamic analysis of power system

LIST OF EXPERIMENTS

1. Power flow analysis by Newton-Raphson method and Fast decoupled method
2. Transient stability analysis of single machine-infinite bus system using classical machine model
3. Contingency analysis: Generator shift factors and line outage distribution factors
4. Economic dispatch using lambda-iteration method
5. Unit commitment: Priority-list schemes and dynamic programming
6. State Estimation (DC)
7. Analysis of switching surge using EMTP: Energisation of a long distributed- parameter line
8. Analysis of switching surge using EMTP : Computation of transient recovery voltage
9. Simulation and Implementation of Voltage Source Inverter
10. Digital Over Current Relay Setting and Relay Coordination using Suitable software packages
- 11 Co-ordination of over-current and distance relays for radial line protection

OUTCOMES:

- Upon Completion of the course, the students will be able to:
- Analyze the power flow using Newton-Raphson method and Fast decoupled method.
- Perform contingency analysis & economic dispatch
- Set Digital Over Current Relay and Coordinate Relay

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COURSE DURATION : 45 Hrs

225153LAB- LABVIEW FOR INDUSTRIAL APPLICATIONS

Level-1:IntroductionLabVIEW

What Exactly is LabVIEW-What can LabVIEW do for you- How doesLabVIEWwork- EvolutionofLabVIEW-WhatisDAQ-CommunicationusingSerialPort-LabVIEWdowntoolkits- LabVIEWRealTime.FPGA,PDA,andEmbedded.

Level-2:LabVIEWEnvironment

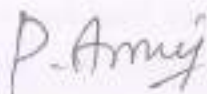
Front panel, control and indicator- Block Diagram, Nodes , Wires, Data FlowProgramming-LabVIEWProjects,ProjectExplorerwindow,projectExplorerToolbars- BuildingApplication-Installers-FloatingPalettes-

Level-3:LabVIEWFoundation

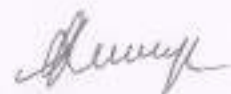
Creating VI- Basic Controls- Indicators- Booleans- String- Paths- Decorations- CustomControlsandIndicators-Automaticwircrouting-AutomaticWiring-WiringComplicated Objects- Bad Wires – Wiring Tips- adding Constants- Controls and indicators –Keyboard Shortcuts-Closing End object.

Level-4:EmbeddedcombiningwithLabVIEW

VISA connection-Baudrate Calculation-Measurement and Automation Explorer-Serial Communication with Microcontrollers.



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Software Tools in the Course

1. MicroVision Keil
2. LabVIEW
3. Measurement & automation Explorer
4. Proteus Simulator
5. Proload

Duration : 45 Hrs

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225153FA-FAULT ANALYSIS IN HOME APPLIANCES

Course objective:

1. To understand the key elements of electrical and electronics appliances.
2. To understand the domestic wiring and layout.
3. To understand the Basic safety practices.
4. To understand the various principles of domestic equipment's.
5. To predict the goodness or age estimation of domestic equipment's.

Unit: I

Safety Practices; Fires in electrical Circuits & Precautions, Fire Extinguishers & its types, General Safety of Tools & equipment, Rescue of person who is in contact with live wire, Treat a person for electric shock/ injury, Protective clothing: leather or asbestos gloves, flame proof aprons, flame proof overalls buttoned to neck, cuffless (without folds), trousers, reinforced footwear, helmets/hard hats, cap and shoulder covers, ear defenders/plugs, safety boots, glasses/goggles/visors.

Unit: II

General Idea on Various Electrical Measuring Instruments/ Components Types, Multimeter (Digital/ Analog), Energy meter (Digital/analog), Insulation Tester (Megger), Earth tester, Ammeter, voltmeter, Different types of switches, fuse, thermostat, heating elements, registers, conductors, insulators, capacitors, wires and cables (for up to 15 amp) symbol of various components.

Unit: III

Demonstration of Heating and Magnetic Appliances Demonstration of Heating Appliances and their applications. (Heating Appliances –type, Working Principle, Uses.) Demonstration of Magnetic Appliances and their applications (Magnetic Appliances- Type, working principle, uses.)

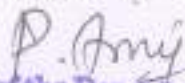
Unit: IV

Maintenance and Repair of heating and motorised appliances Identification, working and specification of each part. Repairing for some common problems, replacement of coil, insulators, thermostat etc. for the following:

- (a) Repair & maintenance of room heater.
- (b) Repair & maintenance of electric iron.
- (c) Repair & maintenance of electric stove (Induction), electric kettle.
- (d) Repair & maintenance of ceiling and table fan.
- (e) Repair & maintenance of domestic pump motor.
- (f) Repair & maintenance of water cooler
- (g) Repair & maintenance of washing machine.

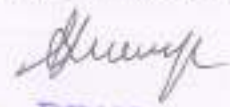
Unit: V

Assemble of Some Appliances Assemble different type of inverters circuit & its measurements. Assemble battery charger circuit used in inverter with protection circuit. Assemble Online/Offline UPS & its



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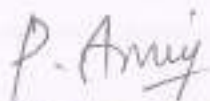
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measurements. Test, faultfinding & repair of given power supply. (DC to AC converter, Types of inverter, its different blocks & oscillators circuits Battery chargers & its protection circuit. UPS working principles of- line & On line UPS circuit used in UPS.

COURSE DURATION : 45 HRS



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225153PCDA -REWINDING OF INDUCTION MOTOR

COURSE OBJECTIVES:

- **Rewinding techniques:** Describe the steps involved in rewinding an induction motor, including winding removal, preparation, insertion, and insulation application.
- **Testing and troubleshooting:** Understand the methods used to test the performance of rewound motors and troubleshoot common issues.

1. Introduction to Induction Motors

- Basic principles of operation
- Types of induction motors (squirrel-cage, wound-rotor)
- Construction features
- Applications

2. Understanding Stator Windings

- Types of winding patterns (single-phase, three-phase)
- Coil pitch and pole pitch
- Winding factors
- Connection diagrams

3. Rotor Windings

- Wound rotor construction
- Slip rings and brushes
- Rotor winding connections

4. Failure Analysis of Induction Motors

- Common causes of motor failures (burnout, insulation breakdown, mechanical damage)
- Fault diagnosis techniques (electrical tests, visual inspection)

5. Rewinding Techniques

- Preparation for rewinding (disassembly, cleaning)
- Removal of old windings
- Insertion of new windings
- Insulation application
- Testing and verification

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6. Winding Materials and Tools

- Types of winding wire (copper, aluminum)
- Insulation materials (varnish, mica tape)
- Rewinding tools (slot wedge, winding machine)

COURSE DURATION : 45 HR

225153SE - SOLAR ENERGY AND ITS APPLICATIONS

Course objectives:

- **Photovoltaic technology:** Describe the principles, types, and characteristics of photovoltaic cells and modules.
- **Solar energy storage:** Understand the need for energy storage in solar systems and various storage technologies.

Unit 1: Introduction to Solar Energy

- Definition of solar energy
- Types of solar energy (thermal, photovoltaic)
- History and development of solar energy
- Advantages and disadvantages of solar energy

Unit 2: Solar Radiation

- Solar spectrum and its components
- Solar irradiance and its measurement
- Factors affecting solar radiation (angle of incidence, atmospheric conditions)
- Solar resource maps and databases

Unit 3: Solar Thermal Energy

- Principles of solar thermal energy conversion
- Types of solar thermal collectors (flat plate, concentrating)
- Solar water heating systems
- Solar cookers and dryers
- Solar power plants (CSP, parabolic trough, central receiver)

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Unit 4: Photovoltaic Energy

- Principles of photovoltaic energy conversion
- Types of solar cells (crystalline, thin-film)
- Solar cell characteristics (I-V curve)
- Solar modules and arrays
- Solar inverters and grid integration
- Off-grid and grid-tied solar systems

Unit 5: Solar Energy Storage And Applications

- Need for energy storage in solar systems
- Types of energy storage (batteries, thermal, pumped hydro)
- Energy storage technologies and their applications
- Residential solar systems
- Commercial and industrial solar systems
- Utility-scale solar power plants
- Solar-powered transportation (electric vehicles, solar-powered aircraft)

COURSE

22515310T - Introduction to IoT

COURSE OBJECTIVES :

- **IoT devices and sensors:** Identify different types of IoT devices and their applications, and data acquisition methods.
- **IoT communication protocols:** Understand various communication systems and their characteristics.

Unit 1: Introduction to the Internet of Things (IoT)

- Definition and concepts of IoT
- Components of an IoT system (devices, connectivity, data analytics)
- IoT applications across various domains (smart homes, smart agriculture, smart cities)
- Benefits and challenges of IoT

Unit 2: IoT Devices and Sensors

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Unit 4: Photovoltaic Energy

- Principles of photovoltaic energy conversion
- Types of solar cells (crystalline, thin-film)
- Solar cell characteristics (I-V curve)
- Solar modules and arrays
- Solar inverters and grid integration
- Off-grid and grid-tied solar systems

Unit 5: Solar Energy Storage And Applications

- Need for energy storage in solar systems
- Types of energy storage (batteries, thermal, pumped hydro)
- Energy storage technologies and their applications
- Residential solar systems
- Commercial and industrial solar systems
- Utility-scale solar power plants
- Solar-powered transportation (electric vehicles, solar-powered boats)

COURSE DURATION : 45 HRS

225153IOT - Introduction to IOT applications

COURSE OBJECTIVES :

- **IoT devices and sensors:** Identify different types of IoT devices and sensors, their applications, and data acquisition methods.
- **IoT communication protocols:** Understand various communication protocols used in IoT systems and their characteristics.

Unit 1: Introduction to the Internet of Things (IoT)

- Definition and concepts of IoT
- Components of an IoT system (devices, connectivity, data analytics)
- IoT applications across various domains (smart homes, smart cities, healthcare, agriculture)
- Benefits and challenges of IoT

Unit 2: IoT Devices and Sensors

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- Types of IoT devices (microcontrollers, sensors, actuators)
- Sensor technologies (temperature, humidity, light, motion, pressure)
- Data acquisition and processing techniques
- Device connectivity options (Wi-Fi, Bluetooth, cellular, LoRa)

Unit 3: IoT Communication Protocols

- Internet protocols (TCP/IP, HTTP)
- IoT-specific protocols (MQTT, CoAP, LWM2M)
- Protocol comparison and selection
- Cloud platforms for IoT (AWS IoT, Azure IoT, Google Cloud IoT)

Unit 4: IoT Data Management and Analytics

- Data collection and storage (time series databases, data lakes)
- Data cleaning and preprocessing
- Data analytics techniques (statistical analysis, machine learning, data visualization)
- IoT platforms and tools for data management

Unit 5: IoT Security and Privacy

- Security threats in IoT (malware, hacking, privacy breaches)
- Security measures (authentication, authorization, encryption)
- Privacy concerns and regulations (GDPR, CCPA)
- Secure IoT development practices

COURSE DURATION : 45 HRS

225153PCA – POWER CONVERTER ANALYSIS AND DESIGN

COURSE OBJECTIVES:

- **Fundamental principles:** Understand the basic principles and operation of power converters, including rectifiers, inverters, choppers, and cycloconverters.
- **Power electronic devices:** Demonstrate knowledge of power electronic devices such as diodes, thyristors, MOSFETs, and IGBTs.
- **Circuit analysis:** Apply circuit analysis techniques to analyze power converter circuits, including steady-state and transient analysis.

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Unit 1: Introduction to Power Converters

- Definition and classification of power converters
- Basic principles of operation
- Applications of power converters in various fields

Unit 2: Power Electronic Devices

- Semiconductor devices (diodes, thyristors, MOSFETs, IGBTs)
- Characteristics and ratings of power electronic devices
- Switching behavior and losses
- Gate drive circuits

Unit 3: Rectifiers

- Single-phase half-wave and full-wave rectifiers
- Three-phase half-wave and full-wave rectifiers
- Controlled rectifiers (single-phase and three-phase)
- Filter circuits for rectifiers

Unit 4: Inverters

- Voltage source inverters (VSI)
- Current source inverters (CSI)
- PWM techniques for inverters (sine-PWM, space vector modulation)
- Multilevel inverters

Unit 5: DC-DC Converters (Choppers) & AC-DC Converters

- Buck, boost, buck-boost, and Cuk converters
- Continuous conduction mode (CCM) and discontinuous conduction mode (DCM)
- Control strategies for DC-DC converters

AC-DC Converters

- Single-phase and three-phase cycloconverters
- Operation and control of cycloconverters
- Applications of cycloconverters

COURSE DURATION : 45 HRS

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SCHOOL OF ARTS AND SCIENCE

DEPARTMENT OF CHEMISTRY

DEPARTMENT ACADEMIC COMMITTEE MEETING CIRCULAR

Date: 27-04-2022

The Department Academic Committee Meeting will be held on 29-04-2020 at 2.45 PM in the staff room. All the staff members are requested to attend the meeting.

Agenda of the meeting:

Curriculum

Feedback

Academic Calendar

Department Activities

Others

Dr.J.S.Nirmal Ram

Head of the Department

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SCHOOL OF ARTS AND SCIENCE

DEPARTMENT OF CHEMISTRY

MINUTES OF THE DEPARTMENT ACADEMIC COMMITTEE MEETING

Date: 29-04-2022

The Department Academic Committee Meeting was held on 29-04-2022 at 2.45 pm. Dr.J.S. Nirmal Ram, Head of the department, welcomed the committee members. Members analyzed the feedback from the stakeholders and the follow-up actions taken. The committee carefully reviewed the curriculum in detail and proposed no changes to the syllabus.

Staff members were asked to conduct department activities like conduct of seminar in the Department seminar Hall. The workload was discussed and courses were allotted to the staff members.

Members present

Dr. P. Parthiban
Dr. M. Jerome Rozario
Dr. D. Senthilnathan
Dr. J.S. Nirmairam
Dr. R Manikandan
Dr. D. Chinnaraja
Dr. M. Surendra Varma
Dr. A. Jenif d'souza
Dr. N.V.Prabhu
Dr. J. Thulasidhasan
Dr. C.R. Shanthy
Dr. R. Shopria
Ms. V.Abarna

Dr.J.S.Nirmal Ram
Head of the Department

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SCHOOL OF ARTS AND SCIENCE
DEPARTMENT OF CHEMISTRY
BOARD OF STUDIES COMMITTEE MEETING CIRCULAR

The Board of Studies Meeting will be held on May 5, 2022, at 10.30 am. All staff members are requested to attend the meeting without fail.

Agenda of the meeting:

Curriculum Feedback Academic Calendar
Department Activities

Dr. J. S. Nirmal Ram
Head of the Department

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DEPARTMENT OF CHEMISTRY


**MEETING OF BOARD OF STUDIES IN DEPARTMENT OF CHEMISTRY MINUTES OF
THE MEETING**

The Meeting of Board of Studies in the department of Chemistry was held on 05.05.2022 at 10.30 am under the Chairmanship of Prof.Dr.L.Chinnappa Dean, School of Arts and Science.

The following members were present:

1. Dr.L.Chinappa, Dean PRIST Deemed to be University,Chairman.
2. Dr. S. Gomathi (Academic Expert)- Professor of Chemistry, Periyar Maniyammal,TN.
3. Mrs. Devi (Industrial Expert) AGM- QC, J,Gujarat
4. Dr. P. Parthiban Professor
5. Dr. M. Jerome Rozario Professor
6. Dr. D. Senthilnathan Associate professor
7. Dr. J.S. Nirmalram Associate professor
8. Dr. R Manikandan Associate professor
9. Dr. D. Chinnaraja Assistant Professor, Member
10. Dr. M. Surendra Varma Assistant Professor, Member
11. Dr. A. Jenif d'souza Assistant Professor, Member
12. Dr. N.V.Prabhu Assistant Professor, Member
13. Dr. J. Thulasidhasan Assistant Professor, Member
14. Dr. C.R. Shanthy Assistant Professor, Member
15. Dr. R. Shopna Assistant Professor, Member
16. Ms. V.Abarna Assistant Professor, Member


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LIST OF MEMBERS

S.NO	NAME OF THE MEMBERS	DESIGNATION	SIGNATURE
1	Dr. S. Gomati	PROFESSOR /ACADAMIC EXPERT	
2	Mrs. Devi	INDUSTRIAL EXPERT	
3	Dr.L.CHINNAPPA	DEAN OF ARTS AND SCIENCE	
4	Dr. P. PARTHIBAN	PROFESSOR	
5	Dr. M. JEROME ROZARIO	PROFESSOR	
6	Dr. D. SENTHILNATHAN	ASSOCIATE PROFESSOR	
7	Dr. J.S. NIRMALRAM	ASSOCIATE PROFESSOR	
8	Dr. R MANIKANDAN	ASSISTANT PROFESSOR	
9	Dr. D. CHINNARAJA	ASSISTANT PROFESSOR	
10	Dr. M. SURENDRA VARMA	ASSISTANT PROFESSOR	
11	Dr. A. JENIF D'SOUZA	ASSISTANT PROFESSOR	
12	Dr. N.V.PRABHU	ASSISTANT PROFESSOR	
13	Dr. J. THULASIDHASAN	ASSISTANT PROFESSOR	
14	Dr. C.R. SHANTHI	ASSISTANT PROFESSOR	
15	Dr. R. SHOPNA	ASSISTANT PROFESSOR	
15	Ms. V.ABARNA	ASSISTANT PROFESSOR	

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The chairman of the board of studies welcomed the members.

The members of the Board scrutinized the existing syllabi for B.Sc Chemistry & M.Phil Chemistry programme and based on the Stakeholders feedback revision in the following Courses have been carried out.

1. It has been proposed to introduce Audit Courses in the B.Sc.(Chemistry) programme curriculum with effect from 2021-22 Based on the following courses are proposed to introduce during various semesters

In Semester I: Universal Human Values

In Semester II : Communication Skills

In Semester III: Office automation-

In Semester IV: Leadership and Management Skills

In Semester V: Professional Skills

The board resolved to approve the syllabus for the above mentioned Audit Courses

2. Based on feedback from the Alumni it has been proposed to introduce the following Audit Courses on Soft Skills in the B.Sc.(Chemistry) programme curriculum with effect from 2022-23

Year I: Basic Behavioral Etiquette


Year II : General Aptitude and Quantitative Ability

Year III: Interview Skills Training and Mock Test

The board further resolved to approve the syllabus of the above mentioned Audit Courses on Soft Skills.


3. There is a Plan of introducing Audit Course on "Community Engagement" in the 3rd year of B.Sc.(Chemistry) programme curriculum with effect from 2022-23
4. The board decided to drop the courses on Communicative English Laboratories.
5. The board decided to drop the courses on Skill Based Elective Courses- Package laboratories.
6. The board decided to drop Course on Extension Activities from the existing curriculum


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of B.Sc.(Chemistry) programme with effect from 2022-23.

7. It is proposed to introduce a course on "Research and Publication Ethics" with 2 credits in the M.Phil.(Chemistry) programme curriculum with effect from 2022-23.
8. It was suggested to introduce phytochemical concepts in the syllabus of Phamacuetical Chemistry in 6th Semester of B.Sc (Chemistry)



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The members of the Board scrutinized the existing syllabi for B.Sc Chemistry & M.Sc Chemistry programme and based on the Stakeholders feedback revision in the following new Courses have been introduced.


The committee recommended introduction of Quantum Chemistry(20114DSC56B), Stereochemistry and Reaction Mechanism (20114DSC56C), Molecular Spectroscopy (20114DSC56D), Mathematical and Computational Methods in Chemistry (20114DSC56E), Spectroscopic Methods of Analysis(20114DSC66B), Bioinorganic Chemistry(20114DSC66C), Methods in Organic Synthesis(20114DSC66D), Chemical Thermodynamics(20114DSC66E), Environmental Chemistry, Basic Concepts of Quantum Chemistry (20214DSC16B), Chemical Kinetics(20214DSC16C), Organometallic Chemistry(20214DSC16D), Aromaticity(20214DSC16E), Special Topics in Chemistry, Molecular Modelling and Drug Design (20214DSC26B), Pericyclic Reactions(20214DSC26C), Inorganic Materials of Industrial Importance(20214DSC26D), Application of Computers in Chemistry(20214DSC26E), Green Organic Synthesis: Principles and Applications(20214DSC35B), Macromolecules as Engineering Materials(20214DSC35C), Pharmaceutical Inorganic Chemistry(20214DSC35D), Industrial Pharmacy(20214DSC35E), Material Chemistry(20214DSC43B), Pharmacology(20214DSC43C), Herbal Drug Technology (20214DSC43D)


The members of the board also scrutinized and updated the panel of examiners for the B.Sc Chemistry & M.Sc Chemistry and submitted the same for the Academic Council for its approval.

Expert members accepted to introduce the courses as listed above.

Furthermore, the individual members offered their viewpoints.

The meeting was concluded with thanks from the chairman.


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9. The committee recommended introduction of Green Chemistry in the Elective Course.
10. The members of the board also scrutinized and updated the panel of examiners for the B.Sc Chemistry & M.Sc Chemistry and submitted the same for the Academic Council for its approval.

Expert members accepted to introduce the courses as listed above.

Furthermore, the individual members offered their viewpoints.

The meeting was concluded with thanks from the chairman.


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SCHOOL OF ARTS OF SCIENCE

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B.Sc CHEMISTRY CURRICULUM

REGULATION 2020

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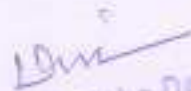
B.Sc CURRICULUM – REGULATION 2020
ACADAMIC YEAR 2022-2023

B.Sc. Graduate Attributes

- Domain knowledge
- Critical thinking
- Effective Communication
- Reflective learning
- Critical thinking

B.Sc Programme Educational Objectives – PEO

- PEO1- Acquired the knowledge with facts and figures related to various subjects in pure sciences .
- PEO2- Understood the basic concepts, fundamental principles, and the scientific theories related to various scientific phenomena and their relevancies in the day-to-day life.
- PEO3- Acquired the skills in handling scientific instruments, planning and performing in laboratory experiments.
- PEO4- The skills of observations and drawing logical inferences from the scientific experiments.
- PEO5- Analyzed the given scientific data critically and systematically and the ability to draw the objective conclusions.
- PEO6- Been able to think creatively (divergently and convergent) to propose novel ideas in explaining facts and figures or providing new solution to the problems. PEO7-Realized how developments in any science subject helps in the development of other science subjects and vice-versa and how interdisciplinary approach helps in providing better solutions and new ideas for the sustainable developments. PEO8- Developed scientific outlook not only with respect to science subjects but also in all aspects related to life.
- PEO9- Realized that knowledge of subjects in other faculties such as humanities, performing arts, social sciences etc.
- PEO10- Can have greatly and effectively influence which inspires in evolving new scientific theories and inventions.
- PEO11- Imbided ethical, moral and social values in personal and social life leading to highly cultured and civilized personality.
- PEO12- Developed various communication skills such as reading, listening, speaking, etc., which we will help in expressing ideas and views clearly and effectively.
- PEO13- Realized that pursuit of knowledge is a lifelong activity and in combination with untiring efforts and


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B.Sc Programme Outcome – PO

- PO1- To understand basic facts and concepts in Chemistry while retaining the exciting aspects of Chemistry so as to develop interest in the study of chemistry as a discipline.
- PO2- To develop the ability to apply the principles of Chemistry.
- PO3- To appreciate the achievements in Chemistry and to know the role of Chemistry in nature and in society. To develop problem solving skills.
- PO4- To be familiarised with the emerging areas of Chemistry and their applications in various spheres of Chemical sciences and to apprise the students of its relevance in future studies.
- PO5- To develop skills in the proper handling of apparatus and chemicals.
- PO6- To be exposed to the different processes used in industries and their applications.


B.Sc. Course – C


- C1- General Chemistry – I
- C2- Volumetric Analysis Lab
- C3- Mathematics – I
- C4- Mathematics – II
- C5- General Chemistry – II
- C6- Organic Analysis Lab
- C7- Mathematics - III
- C8- Mathematics – IV
- C9- Research Led Seminar
- C10- General Chemistry – III
- C11- Physical Chemistry Lab – I
- C12- Physics - I & II
- C13- Physics Lab – I & II
- C14- Research Methodology
- C15- General Chemistry - IV
- C16- Physical Chemistry Lab – II
- C17- Inorganic Chemistry – I
- C18- Organic Chemistry – I
- C19- Physical Chemistry – I
- C20- Inorganic Qualitative Analysis Lab
- C21- Gravimetric Analysis Lab
- C22- Participation in Bounded Research
- C23- Inorganic Chemistry – II
- C24- Organic Chemistry – II


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- C25- Physical Chemistry – II
- C26- Project Work
- C27- Package Lab I to VI
- C28- Communication Lab I to VI


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B.Sc Curriculum Mapping

Programme Educational Objectives Vs Programme Outcome

Programme Outcome-PO Programme Educational Outcome - PEO	PO1	PO2	PO3	PO4	PO5	PO6
PE01	☐☐					
PE02						
PE03		☐☐				
PE04			☐☐			
PE05						
PE06					☐☐	
PE07				☐☐		
PE08						☐☐
PE09	☐☐			☐☐		
PE10		☐☐	☐☐			
PE11						
PE12				☐☐		
PE13	☐☐		☐☐		☐☐	

B.Sc Curriculum Mapping

Programme Outcome vs Courses Outcome

Programme Outcome-PO Courses Outcome-CO	PO1	PO2	PO3	PO4	PO5	PO6
CO1			*	*		*
CO2		*		*	*	*
CO3	*	*		*	*	*
CO4			*	*		*
CO5			*	*		*
CO6		*		*	*	*
CO7	*	*			*	
CO8	*	*	*		*	
CO9		*			*	*
CO10		*	*	*		*
CO11		*		*	*	
CO12	*	*		*	*	
CO13		*	*	*	*	
CO14		*	*	*	*	*

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CO15	*		*		*	
CO16		*		*		*
CO17	*	*	*	*	*	
CO18		*		*	*	
CO19	*			*	*	*
CO20			*	*		
CO21	*		*			*

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CO22	*	*		*		*
CO23	*	*	*	*	*	*
CO24	*	*	*	*	*	*
CO25	*	*		*	*	
CO26	*	*		*	*	
CO27		*	*			
CO28						

B.Sc. CHEMISTRY SYLLABUS – REGULATION 2020



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SCHOOL OF ARTS AND SCIENCE

DEPARTMENT OF CHEMISTRY

B.Sc CHEMISTRY – REGULATION 2020

COURSE STRUCTURE


SEMESTER – I		L	T	P	C
COURSE CODE	COURSE TITLE				
20110AEC11/ 20111AEC11/ 20132AEC11/ 20135AEC11	Tamil – I / Advanced English – I / Hindi – I / French-I	4	0	0	2
20111AEC12	English – I	4	0	0	2
20114AEC13	General Chemistry – I	6	0	0	4
20114AEC14L	Volumetric Analysis Lab	0	0	3	2
20112AEC15A (OR) 20114AEC17	Calculus and Fourier Series General and Applied Botany –I	5	0	0	4
20112AEC16A (OR) 20114AEC18L	Algebra and Trigonometry General Botany Lab –I	6	0	0	6
20112AEC16A (OR) 20114AEC18L	Indian Constitution	4	0	0	3
20114AEC18L	Universal Human Values	0	0	3	2
201INDCONS		0	0	0	0
		-	-	-	2
	Total	29	0	06	19

[Signature]
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SEMESTER – II					
20110AEC21	Tamil – II /				
/	Advanced English – I I /				
20111AEC21	Hindi – II /	4	0	0	2
/	French-II				
20131AEC21	English – II	4	0	0	2
/	General Chemistry – II	6	0	0	4
20135AEC21					
20111AEC22					
20114AEC23					


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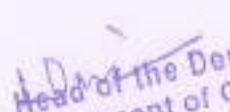
20114AEC24L	Organic Analysis Lab	0	0	3	2
20112AEC25A (OR)	ODE, PDE and Laplace Transform	5	0	0	4
20114AEC29A	General and Applied Botany -II	6	0	0	6
20112AEC26A	Analytical Geometry in Vector Calculus	4	0	0	3
20114AEC20L	General Botany Lab -II	0	0	3	2
20114RLC27	Research Led Seminar	-	-	-	1
	Communication Skills	-	-	-	2
	Basic Behavioral Etiquette	-	-	-	2
	Total	29	0	06	22


SEMESTER - III

20110AEC31/ 20111AEC31/ 20131AEC31/ 20135AEC31	Tamil - III / Advanced English - II I / Hindi - III / French-III	4	0	0	2
20111AEC32	English - III	4	0	0	2
20114AEC33	General Chemistry - III	5	0	0	4
20114AEC34L	Physical Chemistry - Non - Electrical Practical	0	0	3	2
20113AEC35	Physics - I	6	0	0	5
20113AEC36L	Physics Lab - I	0	0	3	2
20114RMC37	Research Methodology	2	0	0	2
	Office automation	-	-	-	2
	Total	21	0	06	21

SEMESTER - IV

20110AEC41/ 20111AEC41/ 20131AEC41/ 20135AEC41	Tamil - IV / Advanced English - IV / Hindi - IV / French-IV	4	0	0	2
20111AEC42	English-IV	4	0	0	2
20114AEC43	General Chemistry - IV	5	0	0	4
20114AEC44L	Physical Chemistry - Electrical Practical	0	0	3	2
20113AEC45	Physics - II	6	0	0	5
20113AEC46L	Physics Lab - II	0	0	3	2
201ENVTSTU	Environmental Studies	2	-	-	2
	Leadership and Management Skills	-	-	-	2


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	General Aptitude and Quantitative Ability	-	-	-	2
	Total	21	0	06	23
SEMESTER – V					
20114AEC51	Inorganic Chemistry – I	5	0	0	4


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20114AEC52	Organic Chemistry – I	4	1	0	3
20114AEC53	Physical Chemistry	4	1	0	4
20114AEC54L	Inorganic Qualitative Analysis Lab	0	0	3	2
20114AEC55L	Gravimetric Analysis Lab	0	0	3	2
20114DSC56_	Discipline Specific Elective –I	5	0	0	3
20114BRC57	Participation in Bounded Research	-	-	-	1
	Professional Skills	-	-	-	2
	Interview Skills Training and Mock Test	-	-	-	2
	Total	18	02	06	23
SEMESTER – VI					
20114AEC61	Inorganic Chemistry – II	4	1	0	4
20114AEC62	Organic Chemistry – II	5	0	0	5
20114AEC63L	Industrial Chemistry Practical	0	0	3	2
20114AEC64L	Domestic Products Preparation - Practical	0	0	3	2
20114DSC65_	Discipline Specific Elective – II	5	0	0	3
201_ _OEC66_	Open Elective	4	0	0	2
20114PRW67	Project Work	0	0	0	4
20114PEE	Community Engagement	-	-	-	1
	Programme Exit Examination	0	0	0	1
	Total	18	01	06	24
Total Credits of the Program					132

DISCIPLINE SPECIFIC ELECTIVE COURSES – I & II

Semester	Elective No.	Course Code	Course Title
V	I	20114DSC56A	A) Pharmaceutical Chemistry
		20114DSC56B	B) Agricultural Chemistry
		20114DSC65A	A) Polymer Chemistry
VI	II	20114DSC65B	B) Nano Science

OPEN ELECTIVE COURSES

Semester	Course code	Course Title
	20110OEC	Tamil Ilakkiya Varalaru

LD


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VI	201110EC	Journalism
	201120EC	Development of Mathematical Skills
	201130EC	Instrumentation
	201160EC	Wildlife Conservation
	201200EC	E-Learning
	201200EC	Web Technology
	201610EC	Banking Service


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RESEARCH BASED COURSES

Semester	Course Code	Course Title
II	20114RLC27	Research Led Seminar
III	20114RMC37	Research Methodology
IV	20114BRC57	Participation in Bounded Research

AUDIT COURSES

Semester	Course Code	Course Title
I		Universal Human Values
II		Communication Skills
II		Basic Behavioral Etiquette
III		Office automation
IV		Leadership and Management Skills
IV		General Aptitude and Quantitative Ability
V		Professional Skills
V		Interview Skills Training and Mock Test
VI		Community Engagement

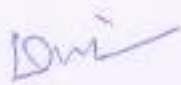
CREDIT DISTRIBUTION


SEMESTER	AEC	DSC	OEC	RESEARCH	OTHERS	TOTAL
I	17	-	-	-	02	19
II	17	-	-	01	04	22
III	17	-	-	02	02	21
IV	17	-	-	-	06	23
V	15	03	-	01	04	23

Wini
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VI	13	03	02	04	02	24
TOTAL	96	06	02	08	20	132


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3	Dr.L.CHINNAPPA	DEAN OF ARTS AND SCIENCE	
4	Dr. P. PARTHIBAN	PROFESSOR	
5	Dr. M. JEROME ROZARIO	PROFESSOR	
6	Dr. D. SENTHILNATHAN	ASSOCIATE PROFESSOR	
7	Dr. J.S. NIRMALRAM	ASSOCIATE PROFESSOR	
8	Dr. R MANIKANDAN	ASSISTANT PROFESSOR	
9	Dr. D. CHINNARAJA	ASSISTANT PROFESSOR	
10	Dr. M. SURENDRA VARMA	ASSISTANT PROFESSOR	
11	Dr. A. JENIF D'SOUZA	ASSISTANT PROFESSOR	
12	Dr. N.V.PRABHU	ASSISTANT PROFESSOR	
13	Dr. J. THULASIDHASAN	ASSISTANT PROFESSOR	
14	Dr. C.R. SHANTHI	ASSISTANT PROFESSOR	
15	Dr. R. SHOPNA	ASSISTANT PROFESSOR	
15	Ms. V.ABARNA	ASSISTANT PROFESSOR	

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SCHOOL OF ARTS AND SCIENCE
DEPARTMENT OF CHEMISTRY
M.Sc CHEMISTRY – REGULATION 2020
COURSE STRUCTURE
ACADAMIC YEAR 2022-2023

M.Sc. Graduate Attributes

- Domain knowledge
- Investigative
- Critical thinking
- Resourceful and Responsible
- Effective Communication
- Ethical and Moral values

M.Sc. Programme Educational Objective – PEO

- PEO1-To demonstrate broad knowledge of descriptive Chemistry.
- PEO2-To impart the basic analytical and technical skills to work effectively in the various fields of chemistry.
- PEO3- To motivate critical thinking and analysis skills to solve complex chemical problems,
e.g., analysis of data, synthetic logic, spectroscopy, structure and modeling,
team-based
problem solving, etc.
- PEO4-To demonstrate an ability to conduct experiments in the above sub-disciplines with mastery of appropriate techniques and proficiency using core chemical instrumentation and modeling methods.
- PEO5-To demonstrate the ability to perform accurate quantitative measurements with an understanding of the theory and use of contemporary chemical instrumentation interpret

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experimental results, perform calculations on these results and draw reasonable conclusions.

PEO6-To develop skills in quantitative modeling of static and dynamic chemical systems.

PEO7-To develop laboratory competence in relating chemical structure to spectroscopic phenomena.

PEO8-To demonstrate the ability to synthesize, separate and characterize compounds using published reactions, protocols, standard laboratory equipment, and modern instrumentation.

M.Sc Programme Outcome –PO

- PO1-Think critically and analyze chemical problems.
- PO2-Present scientific and technical information resulting from laboratory experiment both written and oral formats.
- PO3-Work effectively and safely in a laboratory environment.
- PO4-Use technologies/instrumentation to gather and analyze data.
- PO5-Work in teams as well as independently.
- PO6-Apply modern methods of analysis to chemical systems in a laboratory setting.

M.Sc Course -C

- C1-Organic Chemistry-I
- C2-Inorganic Chemistry-I
- C3-Physical Chemistry-I
- C4-Research Led Seminar
- C5-Organic Chemistry-II
- C6-Inorganic Chemistry-II
- C7-Physical Chemistry-II
- C8-Research Methodology
- C9-Participation in Bounded Research
- C10-Organic Chemistry-III
- C11-Inorganic Chemistry-III
- C12-Physical Chemistry-III
- C13- Participation in Scaffold Research
- C14-Project Work


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M.Sc Curriculum Mapping

Programme Educational Objectives Vs Programme Outcome


Programme Outcome-PO	PO1	PO2	PO3	PO4	PO5	PO6
Programme Educational Outcome - PEO						
PE01	✓					
PE02						
PE03		✓				
PE04			✓			
PE05						
PE06					✓	
PE07				✓		
PE08						✓

M.Sc Curriculum Mapping

Programme Outcome vs Courses Outcome


Programme Outcome-PO	PO1	PO2	PO3	PO4	PO5	PO6
Courses Outcome-CO						
CO1			*	*		*
CO2		*		*	*	*


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CO3	*	*			*	
CO4			*	*		*
CO5			*	*		*
CO6		*		*	*	*
CO7	*	*			*	
CO8		*	*		*	
CO9	*	*			*	*
CO10		*	*	*		*
CO11		*		*	*	
CO12	*	*		*	*	
CO13		*	*	*	*	
CO14		*	*	*	*	*


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DEPARTMENT OF CHEMISTRY
M.Sc CHEMISTRY - REGULATION 2020
COURSE STRUCTURE
ACADAMIC YEAR 2022-2023

SEMESTER - I					
COURSE CODE	COURSE TITLE	L	T	P	C
20214SEC11	Organic Chemistry-I	5	0	0	4
20214SEC12	Inorganic Chemistry-I	5	0	0	4
20214SEC13	Physical Chemistry-I	5	0	0	4
20214SEC14L	Organic Chemistry Lab-I	0	0	5	2
20214SEC15L	Inorganic Chemistry Lab-I	0	0	5	2
20214DSC16	Discipline Specific Elective-I	5	0	0	4
20214RLC17	Research Led Seminar	-	-	-	1
	Total	20	-	10	21
SEMESTER - II					
20214SEC21	Organic Chemistry-II	4	0	0	4
20214SEC22	Inorganic Chemistry-II	4	0	0	4
20214SEC23	Physical Chemistry-II	4	0	0	4
20214SEC24L	Organic Chemistry Lab-II	0	0	5	2
20214SEC25L	Inorganic Chemistry Lab-II	0	0	5	2

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Course Code	Course Title	LTPC	
20114DSC56A		0	0
	PHARMACEUTICAL CHEMISTRY	4	4
Course Outline	<p>UNIT-I: Physical properties in Pharmaceuticals: Physical properties of drug molecule: physical properties. Refractive index- Definition, explanation, formula, importance, determination, specific & molar refraction. Optical activity/rotation- monochromatic & polychromatic light, optical activity, angle of rotation, specific rotation examples, measurement of optical activity. Dielectric constant & Induced Polarization- Dielectric constant explanation & determination. Rheology of pharmaceutical systems: Introduction, Definition, Applications, concept of viscosity, Newton's law of flow, Kinematic, Relative, Specific, Reduced & Intrinsic viscosity. Newtonian system, non-Newtonian system- Plastic flow, Pseudoplastic flow, Dilatent flow. Viscosity measurements- selection of viscometer for Newtonian and non-Newtonian system.</p>		
	<p>UNIT-II: Isotopic Dilution analysis: principle and applications. Neutron activation analysis: Principle, advantages and limitations. Scintillation counters: Body scanning. Introduction to radiopharmaceuticals. Properties of various types of radiopharmaceuticals, Radiopharmaceuticals as diagnostics, as therapeutics, for research and sterilization. Physico Chemical Properties and drug action. Physico chemical properties of drugs (a) Partition coefficient, (b) solubility (c) surface activity, (d) degree of ionization.</p>		
	<p>UNIT-III: Drug dosage and product development: Introduction to drug dosage Forms & Drug Delivery system - Definition of common terms. Drug Regulation and control, pharmacopoeias formularies, sources of drug, drug nomenclature, routes of administration of drugs products, need for a dosage form, classification of dosage forms. Drug dosage and product development. Introduction to drug dosage Forms & Drug Delivery system - Definition of common terms. Drug Regulation and control, pharmacopoeias formularies, sources of drug, drug nomenclature, routes of administration of drugs products, need for a dosage form, classification of dosage forms.</p>		

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	<p>UNIT-IV:Development of new drugs: Introduction,procedure followed in drug design, theresearch for lead compounds, molecular modification of lead compounds. Structure-Activity Relationship (SAR): Factorseffecting bioactivity, resonance, inductive effect, isoterism, bioisosterism, spatial considerations,biological properties of simple functional groups,theories of drug activity, occupancy theory, ratetheory, induced-fit theory,4.3Quantitative structure activity relationship(QSAR): Development of QSAR, drug receptor interactions, the additivity of group contributions; physico-chemical parameters, lipophilicity parameters, electronic parameter, ionizationconstants, steric parameters, chelation parameters, redox potential, indicator-variables.</p>	
	<p>UNIT-V:Computers in Pharmaceutical Chemistry: Need of computers for chemistry. Computers for Analytical Chemists- Introduction to computers: Organization of computers, CPU, Computer memory, I/O devices, information storage, software components. Application of computers in chemistry: Programming in high level language (C+) to handle various numerical methods in chemistry – least square fit, solution to simultaneous equations, numerical differentiation, data smoothing, differentiation and integrations.</p>	
Extended Professional Component (is a part of internal component only. Not to be included in the external examination question paper)	<p>Questions related to the above topics, from various competitive examinations UPSC / TRB / NET/ UGC-CSIR / GATE / TNPSC others to be solved (To be discussed during the Tutorial hours)</p>	
Skills acquired from this course	<p>Knowledge, Problem solving, Analytical ability, Professional Competency, Professional Communication and Transferable skills.</p>	

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Recommended Text	<ol style="list-style-type: none">1. Physical Chemistry- Bahl and Tuli.2. Text Book of Physical Pharmaceutics, IInd edition, Vallabh Prakashan-.C.V.S. Subramanyam.3. Medicinal Chemistry (Organic Pharmaceutical Chemistry), G.R Chatwal, Himalaya Publishing house.4. Instrumental method of Analysis: Hubert H, Willard, 7th edition.5. Textbook of Pharmaceutical Chemistry by, Jayshree Ghosh, S. Chand & company Ltd. Pharmaceutical Chemistry by Dr. S. Lakshmi, Sultanchand & Sons.	
Reference Books	<ol style="list-style-type: none">1. Computers in chemistry, K.V. Raman, Tata Mc.Graw-Hill, 1993.2. Computers for Chemists, S.K Pundir, Anshu bansal, A pragate prakashan., 2 nd edition, New age international (P) limited, New Delhi.3. Physical Pharmacy and Pharmaceutical Sciences by Martins, Patrick J. Sinko, Lippincott. William and Wilkins.4. Cooper and Gunn's Tutorial Pharmacy, 6th edition by S.J. Carter, CBS Publisher Ltd.5. Ansel's pharmaceutical Dosage forms and Drug Delivery System by Allen Popvich and Ansel, Indian edition-B.I. Publication Pvt. Ltd.	
Website and e-learning source	<p>https://www.ncbi.nlm.nih.gov/books/NBK482447/ https://training.seer.cancer.gov/treatment/chemotherapy/types.html</p>	

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Course Code	Course Title				
		L	T	P	C

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20114DSC56B

Phytochemistry

4	1	0	3
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Course Outline

UNIT-I: Pharmacognosy and Standardization of Herbal drugs: Introduction, definition, development classification and Source of Drugs: Biological, mineral, marine, and plant tissue cultures. Study of pharmacognosy of a crude drug. Biosynthesis: Shikimic acid pathway and acetate pathway. Systematic analysis of Crude drugs. Standardization of Herbal drugs. WHO guidelines, Sampling of crude drug, Methods of drug evaluation. Determination of foreign matter, moisture Ash value. Phytochemical investigations-General chemical tests.

UNIT-II: Extraction Techniques: General methods of extraction, types – maceration, Decoction, percolation, Immersion and soxhlet extraction.
 Advanced techniques- counter current, distillation, supercritical gases, sonication, Micro waves assisted extraction. Factors affecting the choice of extraction process.

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	<p>UNIT-III:Drugs containing Terpenoids and volatile oils: Terpenoids: Classification, Isoprene rule, Isolation and separation techniques, General properties Camphor, Menthol, Eucalyptol. Volatile Oils or Essential Oils: Method of Preparations, Classifications of Volatile oils, Camphor oil, Geranium oil, Citral- Structure uses. Pentacyclic triterpenoids: amyrynes; taraxasterol: Structure and pharmacological applications.</p>	
	<p>UNIT-IV:Drugs containing alkaloids: Occurrence,function of alkaloids in plants, pharmaceutical applications. Isolation, Preliminary Qualitative tests and general properties. General methods of structural elucidation. Morphine, Reserpine, papaverine - chemical properties,structure and uses. papaverine-structure, chemical properties and uses.</p> <p>UNIT-V:Plant Glycosides and Marine drugs:</p>	
	<p>Glycosides: Basic ring system, classification, isolation, properties, qualitative analysis. Pharmacological activity of Senna glycosides, Cardiacglycosides- Digoxin, digitoxin, Steroidal saponins glycosides- Diosgenin, hecogenin. Plant pigments: Occurrence and general methods of structure determination, isolation and synthesis of quercetin and cyanidin chloride. Marine drugs -Selected Drug Molecules: Cardiovascular active substances, Cytotoxic compounds, antimicrobial compounds, antibiotic compounds, Anti-inflammatory agents. Marine toxins.</p>	

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Extended Professional Component (is a part of internal component only, Not to be included in the external examination question paper)	Questions related to the above topics, from various competitive examinations UPSC / TRB / NET/ UGC- CSIR / GATE /TNPSC others to be solved (To be discussed during the Tutorial hours)	
Skills acquired from this course	Knowledge, Problem solving, Analytical ability, Professional Competency, Professional Communication and Transferable skills.	
Recommended Text	1. Gurdeep R Chatwal (2016), Organic chemistry of Natural products, Volume I&II, 5th edition, Himalaya publishing House. 2. S.V.Bhat, B.A. Nagasampagi, M.Sivakumar (2014), Chemistry of Natural Products, Revised edition Narosa Publishers.	
Reference Books	1. Jeffrey B. Harborne (2012), Phytochemical methods: A Guide to Modern Techniques of Plant Analysis, 4th Edition, Ashutoshika (2007), Pharmacognosy, Biotechnology, 2nd edition, New age international (P) limited, New Delhi.	

Course Code	Course Title	L	T	PC
20114DSC56C /Green Chemistry		0	0	4 4

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Course Outline	<p>UNIT-I: Introduction to receptors: Introduction, targets, Agonist, antagonist, partial agonist, Receptors, Receptor types, Theories of Drug - receptor interaction, Drug synergism, Drug resistance, physicochemical factors influencing drug action.</p> <p>UNIT-II: Antibiotics: Introduction, Targets of antibiotics action, classification of antibiotics, enzyme-based mechanism of action, SAR of penicillins and tetracyclins, clinical application of penicillins, cephalosporin. Current trends in antibiotic therapy.</p> <p>UNIT-III: Antihypertensive agents and diuretics: Classification of cardiovascular agents, introduction to hypertension, etiology, types, classification of antihypertensive Furosemide, agents, classification and mechanism of action of diuretics, Hydrochlorothiazide, Amiloride.</p> <p>UNIT-IV: Antihypertensive agents and diuretics: Classification of cardiovascular agents, introduction to hypertension, etiology, types, classification of antihypertensive agents, classification and mechanism of action of diuretics, Hydrochlorothiazide, Amiloride.</p> <p>UNIT-V: Analgesics, Antipyretics and Anti-inflammatory Drugs: Introduction, Mechanism of inflammation, classification and mechanism of action and paracetamol, Ibuprofen, Diclofenac, naproxen, indomethacin, phenylbutazone and meperidine. Medicinal Chemistry of Antidiabetic Agents Introduction, Types of diabetics, Drugs used for the treatment, chemical classification, Mechanism of action, Treatment of diabetic mellitus. Chemistry of insulin, sulfonyl urea.</p>
Extended Professional Component (is a part of internal component only, Not to be included in the external examination question paper)	<p>Questions related to the above topics, from various competitive examinations UPSC / TRB / NET / UGC-CSIR / GATE / TNPSC others to be solved (To be discussed during the Tutorial hours)</p>
Skills acquired from this course	<p>Knowledge, Problem solving, Analytical ability, Professional Competency, Professional Communication and Transferable skills.</p>


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Recommended Text	<ol style="list-style-type: none">1. Wilson and Gisvold's textbook of organic medicinal and pharmaceutical chemistry,2. Wilson, Charles Owens; Beale, John Marlowe; Block, John H, Lipincott William, 12th edition, 2011.3. Graham L. Patrick, An Introduction to Medicinal Chemistry, 5th edition, Oxford University Press, 2013. Jayashree Ghosh, A text book of Pharmaceutical Chemistry, S. Chand and Co. Ltd, 1999, 1999 edn.4. O. LeRoy, Natural and synthetic organic medicinal compounds, Ealemi, 1976.5. S. Ashutosh Kar, Medicinal Chemistry, Wiley Eastern Limited, New Delhi, 1993, New edn.	
Reference Books	<ol style="list-style-type: none">1. Foye's Principles of Medicinal Chemistry, Lipincott Williams, Seventh Edition, 20122. Burger's Medicinal Chemistry, Drug Discovery and Development, Donald J. Abraham, David P. Rotella, Alfred Burger, Academic press, 2010.3. Wilson and Gisvold's Textbook of Organic Medicinal and Pharmaceutical Chemistry, John M. Beale Jr and John M. Block, Wolters Kluwer, 2011, 12th edn.4. P. Parimoo, A Textbook of Medical Chemistry, New Delhi: CBS Publishers, 1995.5. S. Ramakrishnan, K.G. Prasanna and R. Rajan, Textbook of Medical Biochemistry, Hyderabad: Orient Longman, 3rd edition, 2001.	
Website and e-learning source	<ol style="list-style-type: none">1. https://www.ncbi.nlm.nih.gov/books/NBK482447/2. https://training.seer.cancer.gov/treatment/chemotherapy/types.html3. https://www.classcentral.com/course/swayam-medicinal-chemistry-12908	


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SCHOOL OF ARTS AND SCIENCE
DEPARTMENT OF CHEMISTRY

VALUE ADDED COURSE
Academic year: 2022-2023

Diploma Course on Water Resources, Management, and Water
Pollution & Health

Aim; To provide an idea on Water Resources, Management, and Water
Pollution & Health

Course learning outcomes:

- The participants will learn about the importance of water resources.
- The participants will get insight into the water cycle.
- They will learn and understand the water pollution problem and its gravity.

UNIT -1

- Water cycle and water chemistry
- The water cycle, Properties of water.
- Tetrahedral chemistry of water.
- Physical Physico chemical characteristics water bodies.

UNIT -2

- Water resources and treatment
- Types of water resources
- National drinking water policy.
- Drinking water treatment plants and various disinfection processes.
- Household treatment, Drinking water standards.

UNIT -3

- Water pollution
- Causes effect and control measures of water pollution.
- Pollution control standards, WHO standards of drinking water.
- Waterborne diseases. Microbial contamination of water types, sources, threats.

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- Microbial standards of drinking water, MPN.

UNIT -4

- Water conservation and water pollution acts in India.
- Water conservation: Ice stupa artificial glacier by Sonam Wangchuk.

UNIT -5

- Rainwater harvesting.
- Watershed Management: Classification, Objective, Advantages and Disadvantages.

References

1) Water Q&A: Why is water the "universal solvent?". Water Science School, United States Geological Survey, U.S. Department of the Interior, 20 June 2019. Archived from the original on 6 February 2021. Retrieved 15 January 2021.

2) 10.2: Hybrid Orbitals in Water". Chemistry LibreTexts, 18 March 2020. Archived from the original on 30 July 2022. Retrieved 11 April 2021.

3) Environmental Health Education Program. Cambridge, MA: Harvard T.H. Chan School of Public Health, July 23, 2013. Archived from the original on September 18, 2021. Retrieved September 18, 2021.

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SCHOOL OF ARTS AND SCIENCE
DEPARTMENT OF CHEMISTRY

Branch name	Year	Course offered
Chemistry	III BSc	Crystallization and Chromatography Techniques

VALUE ADDED COURSE
Academic year: 2022-2023

Diploma Course on Crystallization and chromatography techniques

Aim:

To introduce students to Crystallization and chromatography techniques.

Objectives:

To inculcate concepts of thin layer and column identification and validation.

To understand techniques in Phenotypic screening and target deconvolution.

To increase the employability of the students.

To educate about thin-layer column Chromatographic techniques of novel biologically active compounds.

Course Outcomes

At the end of the course, students will be able to turn to understand methods of crystallization

Explain the principles and techniques of column and thin-layer chromatography techniques.

Purify the compounds by crystallization technique.

Analyse and detect the sample thin-layer chromatography


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Separate the isomers of a compound by column chromatography technique **Unit –**

Crystallization

Principle, Methods of recrystallization Melt crystallization, Suspension crystallization; solvents for recrystallization, Precipitation, Nucleation, Supersaturation, Common challenges in crystallization. Processes involved in crystallization, and applications.

Unit-II

Chromatography Techniques

Chromatography – Adsorption, Partition chromatography. Column Chromatography - Principle, Adsorbents, developers, solvents, columns, packing of the columns, elution, eluting solvent selection-polar and non-polar; Applications.

Thin Layer chromatography – Principle, Rf, preparation of chromatophores application of sample on the chromatophores choice of adsorbents, selection of solvent, locating reagents, developing chamber, development of chromatogram and Applications.

Unit-III Practical

Crystallization of simple compounds

Zinc oxide, Copper sulfate, Sodium acetate, Sodium Chloride, Potash alum, Phthalic acid, Benzoic acid, Acetyl salicylic acid, Urea, and Sugar.

Unit – IV Practical

Thin Layer Chromatography

Separation of Mixture of benzophenone and naphthalene

Separation of Mixture of 2-nitrophenol and 4-nitrophenol

Separation of Mixture of Diphenylamine, Benzophenone and Naphthalene Separation of Mixture of Azobenzene, Hydroxyazobenzene and p-aminoazobenzene

Unit – V Practical

Column Chromatography

Separation of $KMnO_4$ and $K_2Cr_2O_7$ Isolation of 2-nitrophenol and 4-nitrophenol

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VALUE ADDED COURSE

Academic year: 2022-2023

Diploma Course on Molecular Structure Drawing Tool

Aim:

- To introduce students to molecular structure and biological evaluation of novel biologically active compounds.

Objectives:

To inculcate concepts of molecular structure target identification and validation.

To understand techniques in Phenotypic screening and target convolution.

To increase employability of the students.

To educate about role of molecular structure of novel biologically active compounds

Course Outcomes:

At the end of this unit, you will be able to:

- Understand the software used in chemistry
- Perform the Manipulations of Selected Objects
- Apply the chemdraw software to draw the different systems
- Generate the IUPAC and physical properties of organic compounds
- Predict resonance spectral data of chemical structures.

UNIT-I: Molecular Structure Drawing Tool

ChemDraw - Introduction, Installation, Drawing molecular structures - structuretypes, drawing the framework of a structure, Drawing Bonds of Different Types Changing Bond Types, Introducing Atom Labels,

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UNIT-II: Manipulations with Selected Objects

Manipulations with Selected Objects- Select Objects, Move Objects, Copy Objects, Rotate and Mirror Objects, Stretch/Shrink/Scale Objects, Structure Perspective, Join Objects.

UNIT-III: ChemDraw-Practical I

Drawi g of molecules - acyclic, cyclic, heterocyclic and bicyclic systems

- Analysis of molecules - formula, exact mass and elemental analysis
- Graphical representation of reaction scheme

UNIT-IV: ChemDraw-Practical II

- Chemical structures to IUPAC names
- IUPAC naming to chemical structures
- 2D structures into 3D structures
- Prediction of boiling point, melting point, critical temperature, critical pressure, critical volume and heat of formation.

UNIT-V: ChemDraw-Practical III

Prediction of ^1H NMR & ^{13}C NMR of following compounds:

Ethanol, Ethyl methyl ketone, Cycloheptonone, Pyridine and α -naphthol

Text Books:

Dr. Stefan Bienz Short Manual to the Chemical Drawing Program ChemDraw University of Zurich I-V


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DEPARTMENT OF CHEMISTRY

VALUE ADDED COURSE

SOIL AND WATER CHEMISTRY

Course Outcomes:

At the end of the course students will be able to

CO1: Understand the composition of soils

CO2: Infer the optimal growth conditions for plants

CO3: Analyze the soil quality

CO4: Categorize the types of water and sources of water pollution

CO5: Interpret the quality of water

UNIT-I

Properties of Soil

Soil- definition, composition, types. Soil pH- importance of soil pH on plant growth, saline, alkaline and acidic soils, reclamation of acidic and alkaline soils. Fertilizer - definition, classification, role of fertilizers on plant growth, adverse effects. Soil for banana, cotton, ground nut, sugar cane, paddy and maize cultivation.

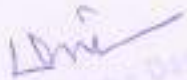
UNIT-II

Water: types of water- hard and soft water, types of hardness-temporary and permanent, softening of water, water pollution-causes and remedial measures. Water quality parameters-hardness, pH of water, electrical conductivity, turbidity, TDS, DO, BOD, COD- standards and limits (WHO and BIS)

UNIT-III

Soil Testing Practical -I

Determination of soil pH, electrical conductance and turbidity by soil analyzer kit


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UNIT-IV

Soil Testing Practical -II

Determination of Na, K and Ca in soil by flame photometer

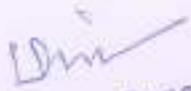
UNIT-V


Water Quality Analysis -Practical

Determination of water pH, electrical conductivity, turbidity, TDS and DO. Preparation of a comparative report of standard values (WHO & BIS) and experimental values.

Text Books:

S. No	Author	Book	Edition	Publisher Details	Year	Units Covered
1.	L. Bhattacharya	Text Book of Soil Chemistry	1th Edition	Discovery Publishing House, New Delhi	2019	I, III & IV
2.	R.L. Arya And Khalil Khan	Fundamentals of Soil Science	1th Edition	Scientific Publishers, Jodhpur	2020	I, III & IV
3.	James Edzwald	Water Quality and Treatment	4th Edition	McGraw Hill Inc, New York	1990	II & V


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DEPARTMENT OF CHEMISTRY

Branch name	Year	Course offered
BSC / PHYSICS 22416NH	III BSc	Mathematical Tools and use of Application Software in Chemistry

Mathematical Tools and use of Application Software in

Chemistry

Course Objectives:

The course aims to impart analytical, numerical, computational and technical skills on the relevant field of Chemistry for facilitating employability in academia and industries

Unit 1

Mathematical Tools: Coordinate geometry; Cartesian and polar coordinate systems and their

interconversion.

Preliminary idea about complex number and complex variable.

Vectors and Matrices: Vectors, preliminary idea of vector space, matrix algebra, matrix inversion, matrix eigenvalue and eigenvector, solution of simultaneous algebraic equation with

more than two unknowns.

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Elementary analytical methods to solve differential equations.

Functional Series and Integral Transforms: Fourier transform, Laplace transform.

Power series method for differential equations (Hermite, Legendre, Laguerre differential equations)

Unit 2

Mathematica and Matlab: Introduction to Mathematica and Matlab for symbolic computation

of simple algebra and numerical mathematics.

Evaluating and plotting mathematical functions, solving algebraic equations, solving simultaneous equations, differentiation, integration, integral transform, series, solving differential equations (ODE & PDE), performing matrix algebra, curve fitting.

Unit 3

LATEX: Introduction of LATEX, downloading and installing TeXstudio or TeXmaker, writing

equations, making tables, inserting figures and references.

JabRef: Managing and citing references in LATEX typesetting system.

Course learning outcome: After the completion of the course, the students should be able to

1. Perform analytical calculations of the mathematics involved in the elementary physical chemistry.

2. Use Mathematica and Matlab softwares to perform algebraic and numerical calculation

and visualize mathematical functions by plotting graphs relevant to the topics of physical

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chemistry like chemical kinetics, thermodynamics, quantum chemistry etc.

3. Write scientific documents using the typesetting platform LATEX.

Unit 4

Origin and SciDAVis: Introduction of origin and SciDAVis, GNU plot, drawing various 2D &

3D plots, data analysis, statistics, signal processing, curve fitting, peak analysis, conversion of graph to various file format like JPEG, GIF, EPS.

Unit 5

ChemDraw and ChemSketch: Introduction of ChemDraw, chemical name to structure conversion, chemical structure to name conversion, mass spectrum simulation, NMR spectrum

simulation (both ^1H NMR & ^{13}C NMR), structure clean up, 3D chemical structure, export to SVG, PDF, TIFF.

Introduction to ChemSketch, molecular modelling, creating and modifying images of chemical

structures, writing and performing chemical equations and diagrams.

Course learning outcome:

After the completion of the course, the students should be able to

1. Use of software relevant to chemistry, scientific graph plotting and data analysis.
2. Apply ChemDraw and ChemSketch software for molecular modelling, writing structures

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and chemical equations.

3. Operate various Quantum Chemical and Docking software, analyze and interpret the results obtained by calculation to rationalize experimental outcomes or even making testable prediction.

4. Understand the crystal structure and bonding in molecule. They would learn to organize

references in an article.

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1) **Quantum Chemistry(20114DSC56B),**

UNIT-I Quantum Chemistry-I Quantum mechanical operators, Postulates of quantum mechanics, Schrödinger equation and its application to particle in one-dimensional box (complete solution) - quantization of energy levels, zero-point energy, normalization of wave functions, probability distribution functions, nodal properties.

UNIT-II Extension to three-dimensional boxes, separation of variables, degeneracy.

Qualitative treatment of simple harmonic oscillator model of vibrational motion: Setting up of Schrödinger equation and discussion of solution and wave functions. Vibrational energy of diatomic molecules and zero-point energy. Angular momentum: Commutation rules, quantization of square of total angular momentum and z-component. Vibration-rotation spectroscopy: diatomic vibrating rotator, P, Q, R branches.

UNIT-III Rigid rotator model of rotation of diatomic molecule: Schrödinger equation, transformation to spherical polar coordinates. Separation of variables (Preliminary treatment). Vibrational spectroscopy: Classical equation of vibration, computation of force constant, amplitude of diatomic molecular vibrations, anharmonicity, Morse potential, dissociation energies, fundamental frequencies, overtones, hot bands, degrees of freedom for polyatomic molecules, modes of vibration.

UNIT-IV Chemical Bonding Chemical bonding: Covalent bonding, valence bond and molecular orbital approaches, LCAOMO treatment of $H_2 +$. Bonding and antibonding orbitals. Qualitative extension to H_2 . Comparison of LCAO-MO and VB treatments of H_2 (only wave functions, detailed solution not required) and their limitations. Localized and non-localized molecular orbitals treatment of triatomic (BeH_2 , H_2O) molecules. Qualitative MO theory and its application to AH_2 type molecules.

UNIT-V Molecular Spectroscopy-I Interaction of electromagnetic radiation with molecules and various types of spectra; BornOppenheimer approximation. Rotation spectroscopy: Selection rules, intensities of spectral lines, determination of bond lengths of diatomic and linear triatomic molecules, Isotopic substitution.

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2) Stereochemistry and Reaction Mechanism (20114DSC56C),

Course Content:


UNIT – I Stereochemistry 20 L Chirality: Stereogenic unit: Center of chirality, axis of chirality, plane of chirality and helicity. Stereochemistry of - allenes, spirans, biphenyls, cyclophanes, ansa compounds, trans-cyclooctene, helicenes, benzphenanthrenes. Configurational nomenclature; Stereochemistry of compounds containing nitrogen, sulphur and phosphorus.


UNIT – II

Topicity and Prochirality: Topicity of ligands and faces. Diastereotopic ligands and NMR spectroscopy. Chemical reactivity of heterotopic ligands and faces with chiral and achiral reagents. Resolution of racemates. Stereoselectivity and stereospecificity: Kinetic and thermodynamic controls, asymmetric induction, chiral auxiliary, diastereotopic induction, Principles of asymmetric synthesis, Cram's rule, Felkin's model, Prelog's rule. Conformational analysis of cycloalkanes: Cyclohexane, mono-substituted cyclohexanes; disubstituted cyclohexanes, effect of conformation on reactivity. Decalins. Conformational analysis of sugars. Anomeric effect.

UNIT – III Reaction Mechanism 25 L Structure and reactivity: Ambident electrophiles and nucleophiles; Hard and soft concept. Acidity and basicity: Different concepts. Controlling structural factors, Methods of determining reaction mechanism: Kinetic and non-kinetic methods. Hammett and Taft equations. Reactive intermediates: Nonclassical carbocations; Carbenes, nitrenes, – Generation, structure, reactions Nucleophilic substitution reactions: Recapitulation of S_N1 , S_N2 , S_Ni reactions with stereochemistry.

UNIT – IV S_NcA and S_N' reactions, Nucleophilic substitutions at sp^2 hybridized carbon and aromatic ring, including vicarious substitution, Factors affecting reactivity. Neighbouring group participation Elimination reactions: $E1$, $E2$ and $E1cB$ mechanisms. Orientation in elimination reactions; Reactivity;


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UNIT – V Effect of substrate, base, leaving group, medium. Pyrolytic elimination reactions. Addition to carbon-carbon multiple bonds: Additions involving electrophiles and free radicals: Mechanism, reactivity, orientation and stereochemistry, regio- and chemo-selectivity.

Course outcome:

To be able to predict, identify and distinguish between various types of stereogenic units present in the molecules.

Gains preliminary knowledge of NMR spectroscopic technique.

To be able to predict major/minor stereoisomers in a given asymmetric reaction.

At the end of the course, the student should be able to propose/write a mechanism for a given organic reaction.

To be able to design experiments to determine reaction intermediates/mechanisms.

3) Molecular Spectroscopy (20114D5C56D),

Course Objectives: To provide basic knowledge of molecular spectroscopy, partition function, ionic atmosphere and collision theory.


Unit 1


Molecular Spectroscopy (M=14) Molecular spectroscopy: Introduction, elementary idea about spectroscopic instrumentation, spectral broadening. Electromagnetic spectrum and molecular processes associated with the regions.

Unit II

Rotational spectra of polyatomic molecules: classification of molecules into spherical, symmetric and asymmetric tops; linear triatomic molecules, Non-rigid rotor. Elementary idea of Stark effect. Anharmonic oscillator and dissociation.

Unit III


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Elementary idea of Born-Oppenheimer approximation, Vibration rotation spectra for diatomic molecule, Rotationalvibrational coupling. Raman spectra: classical theory of Raman scattering, concept of polarizability ellipsoid.

Unit IV

Statistical mechanics- I (M = 12) Probability, thermodynamic probability and entropy, Maxwell-Boltzman statistics, Partition function: translational (for ideal gas - concept of thermal wavelength), rotational, vibrational and electronic partition functions (diatomic molecule); molecular and molar partition function, Qualitative idea of Quantum statistics (Bose-Einstein, Fermi-Dirac statistics):

Unit V

Thermodynamic probability and distribution formula (without derivation), comparison with classical statistics - distinguishability and indistinguishability of identical particles. Application: Theory of specific heat of solids – Einstein's and Debye's pictures

4) Mathematical and Computational Methods in Chemistry (20114DSC56E),

Unit I Mathematical Review of Classical Mechanics: Lagrangian Formulation, Hamiltonian Formulation, Poisson Brackets and Canonical Transformations Classical approach to Ensembles:

Unit II Ensembles and Phase Space, Liouville's Theorem, Equilibrium Statistical Mechanics and it's ensembles Partition Function: Review of rotational, vibrational and translational partition functions.

Application of partition functions to specific heat of solids and chemical equilibrium. Real gases.

Unit III Elementary Probability Theory: Distributions and Averages, Cumulants


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and Fluctuations, The Central Limit Theorem Distributions & Fluctuations: Theory of Ensembles, Classical and Quantum, Equivalence of Ensembles, Fluctuations of Macroscopic Observable

Unit IV Basic Thermodynamics: Review of Concepts, The Laws of Thermodynamics, Legendre Transforms, The Maxwell Relations, The GibbsDuhem Equation and Extensive Functions, Intensive Function

Unit V Bose-Einstein distribution: Einstein condensation. Thermodynamic properties of ideal BE gas. Fermi-Dirac distribution: Degenerate Fermi gas. Electron in metals. Magnetic susceptibility.

Transactional Modes: Lecture;

Tutorial; Problem solving; Self-learning. Suggested Readings

1. K. Huang (2008). Statistical Mechanics, Wiley.
2. R. K. Pathria and P. D. Beale, (2011). Statistical mechanics, Elsevier.
3. D. A. Mcquarrie, (2018). Statistical Mechanics, Viva Books.
4. D. Chandler, (1987). Introduction to Statistical Mechanics, Oxford University Press.

Press.

Spectroscopic Methods Analysis (20114DSC66B),

5)

Learning Outcomes:

At the end of the course, the students will be able to: □ gain the knowledge about various spectroscopic techniques, such as, electronic, microwave, vibrational, raman, nuclear magnetic resonance, and laser spectroscopy □ understand, how spectroscopic transitions come into picture in molecular quantum mechanics □ learn various spectroscopic selection rules and their applications Course Content

Unit I

Atomic Spectra: Revision of quantum numbers, electron configuration, Hund's rule etc. origin of spectral lines, LS & JJ coupling, selection rules, Spectrum of hydrogen.

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helium and alkali atoms, X-ray spectra, fine spectra, hyperfine structure, Width of spectrum lines.

Unit II 11 hours Molecular Spectra: Molecular potential, Separation of electronic and nuclear wave functions, Born-Oppenheimer approximation, Electronic, Vibrational and rotational spectrum of diatomic molecules, Selection rules, Frank-Condon principle,

Unit III

Molecular Spectroscopy: Microwave and Infrared spectroscopy of di- and polyatomic molecules, normal coordinates and their symmetry (CO₂), FT-IR instrumentation

Unit IV

Raman Effect, rotational and rotation-vibrational Raman transitions, nuclear spin effects, polarization of Raman lines, Vibrational spectroscopy of diatomic molecules, Franck-Condon factor, rotational fine structure.

Transactional Modes: Lecture; Tutorial; Problem solving; Self-learning. Suggested Readings

- 1) J. M. Hollas, (2004) Modern Spectroscopy, John Wiley & Sons, Ltd. .
- 2) G. M. Barrow, (1962) Introduction to Molecular Spectroscopy, McGraw-Hill.
- 3) C. N. Banwell and E.M. Mc Cash, (1994) Fundamentals of Molecular Spectroscopy, Tata McGraw Hill, New Delhi .
- 4) L. R. Lakowicz, (2006) Principle of Fluorescence Spectroscopy 3rd Edition, Springer.
- 5) A. Carrington and A. D. Mc Lachlan, (1979) Introduction to Magnetic Resonance Chapman and Hall, London.
- 6) R. K. Harris, (1986) Nuclear Magnetic Resonance Spectroscopy, Addison Wesley, Longman Ltd, London .
- 7) C.J. Foot, (2005) Atomic Physics (Oxford University Press, Oxford, U. K.

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6) **Bioinorganic of Chemistry (20114DSC66C),**

- 1) UNIT 1 : Bioinorganic chemistry: general introduction and prospects, Metals in biology: Natures selection
- 2) UNIT 2 : Design principles used in chemical biology: some noteworthy examples
- 3) UNIT 3 : Life with oxygen
- 4) UNIT 4 : Metals in medicine
- 5) UNIT 5 : significantly in recent years and lies at a natural juncture between chemistry, biology, and medicine. This rapidly expanding field probes fascinating questions about the uses of metal ions in nature.

Books and references

1. Bioinorganic Chemistry by Bertini, Gray, Lippard and Valentine •
2. Principles of Bioinorganic Chemistry by Lippard and Berg •
3. Bioinorganic Chemistry: Inorganic Elements in the Chemistry of Life by Kaim and Schwederski •
4. Biological Inorganic Chemistry by R. R. Crichton

7) **Methods in Organic Synthesis (20114DSC66D),**

Course/Paper -, Methods in Organic Synthesis

UNIT - I Aromatic substitution reactions - electrophilic, nucleophilic and through benzyne - radical substitution of arenes - orientation of nucleophilic substitution at a saturated, carbon, SN1, SN2, SNi reactions - effect of structure, nucleophile, leaving group, solvent. Additions involving electrophiles, nucleophiles and free radicals. Elimination reactions - E1, E1CB, E2 reactions – elimination versus substitution reactions.

UNIT - II Mechanism of some name reactions: Aldol, Perkin, Benzoin, Cannizzaro, Wittig, Grignard, Reformatsky - Meerwein, Hoffmann Claisen and Favorsky rearrangements. Hydroboration - openauer oxidation, clemmensen reduction - Meerwein - Pondorf and verley and Birch reductions, Stork enamine reactions, Michael addition, Mannich Reaction, Diels - Alder reaction, Ene - reaction, Bayer - Villiger Reaction.

UNIT - III Spectra and structure - application of organic spectroscopy UV, IR, 1

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HNMR and Mass spectral data.

UNIT - IV Isolation, structure elucidation and synthesis of alkaloids; atropine, nicotine, and quinine. Purines - Caffeine configuration and ring structures of glucose and fructose, anomeric effects.

Text books:

- 1) Organic Chemistry Vol. I (Sixth Edn.) and Vol. II (Fifth Ed.,) by I.L. Finar ELBS.
- 2) Organic Chemistry (fifth Edn.,) by Morrison and Boyd, PHI, India.
- 3) Organic Chemistry (fifth edition) by Francis A. Carey Tata Mc Graw Hill publishing company Limited, New Delhi.
- 4) Reaction Mechanism in Organic Chemistry by Mukherjee Sirigh, NTernitarr, Indiar
- 5) A guide book to mechanism in Organic Chemistry by Peter Sykes, ELBS.

Chemical Thermodynamics (20114DSC66E),

UNIT-I

Thermodynamics and the Chemical Industry

UNIT-II

Equilibrium and Extrema in work

UNIT-III

Heat-Work Interconversion Device

UNIT-IV

Chemical potentials in gas and condensed phases

UNIT-V

Liquid-liquid equilibria/ Reaction Equilibria

TEXT BOOKS

- 1) Smith, J.M. and Van Ness, H.C., 'Introduction to Chemical Engineering Thermodynamics', McGraw Hill (1975). This is the most comprehensive book. The subsequent editions of this book (6th and 7th) have an additional

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author, M.M. Abbott and some additional topics, that are not normally part of an undergraduate course.

2) Denbigh, K., 'The Principles of Chemical Equilibria with Applications in Chemistry and Chemical Engineering', Cambridge University Press (1968). This book has the best exposition of concepts. It has no explicit treatment of open systems

8) Environmental Chemistry, Basic Concepts of Quantum Chemistry (20214DSC16B),
UNIT-I

The Multidisciplinary nature of environmental studies Definition, scope and importance. (2 lectures) Need for public awareness

UNIT-II

Natural Resources: Renewable and non-renewable resources: Natural resources and associated problems.

UNIT-III

Ecosystems Concept of an ecosystem. Structure and function of an ecosystem. Producers, consumers and decomposers Energy flow in the ecosystem Ecological succession.

UNIT-IV

Biodiversity and its conservation Introduction - Definition : Genetic, species and ecosystem diversity Biogeographical classification of India Value of biodiversity : consumptive use, productive use, social, ethical, aesthetic and option values

UNIT-V

Environmental Pollution Definition Causes, effects and control measures of : a. Air Pollution b. Water Pollution c. Soil Pollution d. Marine Pollution e. Noise pollution f. Thermal Pollution g. Nuclear hazards

References:

1. Agarwal, K.C. 2001 Environmental Biology, Nidi Public Ltd Bikaner.

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2. Bharucha Erach, The Biodiversity of India, Mapin Publishing Pvt Ltd, Ahamedabad

380013, India, E-mail: mapin@icenet.net(R)

3. Brunner R.C. 1989, Hazardous Waste Incineration, McGraw Hill Inc 480 p

4. Clark R.S. Marine Pollution, Clarendon Press Oxford (TB)

5. Cunningham, W.P.Cooper, T.H.Gorhani E & Hepworth, M.T. 2001.

6. De A.K. Environmental Chemistry, Wiley Eastern Ltd

7. Down to Earth, Centre for Science and Environment (R)

8. Gleick, H.P. 1993. Water in crisis, Pacific Institute for Studies in Dev., Environment
&

Security. Stockholm Env. Institute Oxford University, Press 473p.

9. Hawkins, R.E. Encyclopedia of India Natural History, Bombay Natural History
Society,
Bombay (R)

9) Chemical Kinetics(20214DSC16C),

Unit -1: Solutions

- Raoult's law.
- Colligative properties - relative lowering of vapour pressure, elevation of boiling point, depression of freezing point, osmotic pressure, determination of molecular masses using colligative properties, abnormal molecular mass.
- Solutions, Types of solutions, expression of concentration of solutions of solids in liquids, solubility of gases in liquids, solid solutions.
Van't Hoff factor.

Unit -2: Electrochemistry

- Redox reactions, EMF of a cell, standard electrode potential
- Nernst equation and its application to chemical cells
- Relation between Gibbs energy change and EMF of a cell


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- Kohlrausch's Law
- Electrolysis and law of electrolysis (elementary idea)
- Dry cell-electrolytic cells and Galvanic cells
- Conductance in electrolytic solutions, specific and molar conductivity, variations of conductivity with concentration.
- Lead accumulator
- Fuel cells

Unit -3: Chemical Kinetics

- Rate of a reaction (Average and instantaneous)
- Rate law and specific rate constant
- Integrated rate equations and half-life (only for zero first-order reactions)
- Concept of collision theory (elementary idea, no mathematical treatment)

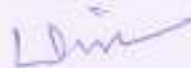
Unit -4: Chemical Kinetics-2

- Factors affecting rate of reaction: concentration, temperature, catalyst;
- Order and molecularity of a reaction
- Activation energy
- Arrhenius equation

Unit -5: d and f Block Elements

- Lanthanoids- Electronic configuration, oxidation states, chemical reactivity and lanthanoid contraction and its consequences.
- Actinoids- Electronic configuration, oxidation states and comparison with lanthanoids.
- General introduction, electronic configuration, occurrence and characteristics of transition metals, general trends in properties of the first-row transition metals – metallic character, ionization enthalpy, oxidation states, ionic radii, color, catalytic property, magnetic properties, interstitial compounds, alloy formation, preparation and properties of $K_2Cr_2O_7$ and $KMnO_4$.

10) Organometallic Chemistry(20214DSC16D),


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UNIT 1 Organometallics, catalysis and spectroscopy

UNIT 2 Photochemistry, Pericyclics and Rearrangements

UNIT 3 Quantum Chemistry and Molecular Spectroscopy

UNIT 4 Physical methods in Chemistry

UNIT 5 Advanced Physical Chemistry Laboratory

11) Aromaticity(20214DSC16E),

of UNIT-I Advanced Stereochemistry: Configuration - conformation
cycloalkanes, conformation and reactivity - stereochemistry of allenes, spiranes, biphenyls,
molecules with chiral planes, Topicity stereoselective and stereospecific reactions -
enantioselective reactions - double stereo differentiation, asymmetric synthesis, chiral
auxiliaries, chiral catalysts and reagents.

UNIT-II Introductory physical organic chemistry: Thermodynamic stability –
general relationship between thermodynamic stability and reaction rates – electronic
substituent effects on reaction

UNIT-III intermediates – kinetic isotope effects – linear free energy relationships
– principles of microscopic reversibility – substituent effects – solvent and solvent effects
– methods of determination of reaction mechanism.

UNIT- IV Aromaticity: Criteria of aromaticity - Craig's rule – non-benzenoid
aromatic compounds – anti-aromaticity, homo aromaticity – fused-ring systems – hetero
aromatic systems. Nucleophilic aromatic substitution reactions – VNS - transition metal-
catalyzed aromatic substitution reactions – aromatic substitution reactions involving
radical intermediates.

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UNIT- V Advanced Heterocycles: Nomenclature, heterocyclics with two hetero atoms – fused five and six membered heterocyclics – preparation and reactions of indole, quinoline, isoquinoline and carbazole.

Prescribed books:

- Nasipuri, D., Stereochemistry of Organic Compounds: Principles and Applications, 4th edition, New Academic Science Publisher. 2012.
- Eliel, E. L., and Wilen, S. H. Stereochemistry of Organic Compounds, Wiley, 1994.
- F.A.Carey and R.J.Sundberg, Advanced Organic Chemistry, Part A: Structure and Mechanisms, 5th edition, 2007.
- Heterocyclic Chemistry- J. A. Joule, K. Mills, G. F. Smith, Blackwell publishing Ltd, 5th edition, 2010.

12) Special Topics in Chemistry, Molecular Modelling and Drug Design (20214DSC26B).

MOLECULAR MODELLING & DRUG DESIGN

Objectives of the Course : The main goal of this course is to gain some knowledge on modern approaches used in molecular modeling. powerful computer-based technology used to identify and design molecules for new medications greatly shortening the discovery phase of drug development by powerful computer-based technology.

UNIT - I : Quantum mechanics & concepts in molecular modeling : Introduction – coordinate systems – potential energy surfaces – introduction to quantum mechanics – postulates – Schrodinger wave equation – hydrogen molecule – Born-Oppenheimer approximation, introduction to computer hardware and software.

Unit II: Molecular mechanics and energy minimization: Empirical force field models – Bond stretching – angle bending – torsional term – nonbonding interactions – thermodynamics properties using a forcefield – derived and non derived energy minimization method – simplex – sequential univariate method – steepest descent method – conjugate gradient method- Newton-Rapson method.

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Unit III: Molecular Dynamics and Monte Carlo simulation :) Introduction – Using single Model – time steps – Multiple steps – Setting up MD – energy conservation in MD Simulation Examples – Monte Carlo – Random number generation – Difference in MD & MC.

Unit IV: Homology modeling: Comparative modeling of proteins – comparison of 3D structure – Homology – steps in homology modeling – tools – databases – side chain modeling – loop modeling.

Unit-V: Drug design: General approach to discovery of new drugs - lead discovery – lead modification – physiochemical principles of drug action – drug stereo chemistry – drug action - 3D database search – computer aided drug design – docking - molecular modeling in drug design – structure based drug design – pharmacophores - QSAR.

TEXT BOOKS:

1. A. R. Leach - Molecular Modeling Principles and Application, 2nd edition, Longman Publications, 1996.
2. D. Baxvanis and Foulette - Bioinformatics: A Practical Guide to the Analysis of Genes and Proteins, Wiley Indian Edition, 2001.

REFERENCE BOOK:

3. T K Attwood, D J parry-Smith, Introduction to Bioinformatics, Pearson Education, 1st Edition, 11th Reprint 2005

13) Pericyclic Reactions(20214DSC26C),

Pericyclic reactions

UNIT-I Aliphatic Nucleophilic Substitution Mechanisms Nucleophilic substitution: Substitution reactions of ambident nucleophiles, neighbouring group

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participation of O, S, N, halogens, aryl groups, alkyl and cycloalkyl groups in nucleophilic substitution reactions. Sigma, Pi bond participation in acyclic and bicyclic systems (Non-classic carbocations) Substitution at allylic, trigonal and Vinylic carbons, hydrolysis of esters, Meyer's aldehydes, ketones and carboxylic acids, alkylation with trialkyl boranes. Aliphatic Electrophilic substitutions: SE1 SE2 and SEi mechanisms hydrogen exchange, migration of double bonds, halogenation of aldehydes, ketones, acids, acylhalides sulphoxides and sulphones, aliphatic diazonium coupling, nitrosation at Carbon and nitrogen diazo transfer reaction carbene and nitrene insertion, formation of sulphur yield, metalation with organometallic compounds and with metals. Decarboxylation of aliphatic acids.

Electrophilic Aromatic and Hetero Aromatic substitution: A general introduction to different mechanisms of aromatic substitution SN Ar, AN and aryne Von Richter rearrangement, sommet, Hauser rearrangement Smiles rearrangement. Radical substitution Mechanism: Reaction at Sp³ carbon: Reactivity in aliphatic substrates reactivity at bridged position, reactivity at Sp² carbon. Reactivity in aromatic substrates, neighbouring group assistance in free radical reactions, effect of reactivity in the attacking radical effect of solvent on reactivity halogenation at an alkyl carbon and allylic carbon, hydroxylation at aromatic carbon by means of Fenton's reagent, oxidation of aldehydes to carboxylic acids, formation of cyclic ethers with Pb(OAc)₄ Reed reaction, sandmeyer reaction, kolbe reaction and Hunsdiecker reaction.

UNIT-III Molecular orbital symmetry, frontier orbitals of ethylene, 1,3 Butadiene, 1,3,5- Hexatriene, allyl system, classification of pericyclic reactions FMO approach, Woodward-Hoffman correlation diagram method and perturbation of molecular (PMO) approach for the explanation of pericyclic reactions under thermal and photochemical conditions. Electrocyclic Reactions: Conrotatory and disrotatory motions (4n) and (4n+2), allyl systems and secondary effects. Cycloadditions: Antarafacial and suprafacial additions, notation of cycloadditions, (4n) and (4n+2) systems with a greater emphasis on (2+2) and (4+4) - cycloadditions, (2+2) - additions of ketones secondary effects of substituents on the rates of cycloadditions and chelotropic reactions.

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UNIT-IV FMO approach and perturbation of molecular (PMO) approach for the explanation of sigma tropic rearrgements under thermal and photochemical conditions. suprafacial and antarafacial shifts of H Sigmatropic shift involving carbon moieties, retention and inversion of configurations, (3,3) and (5,5) sigmatropic rearrangements detailed treatment of Claisen and Cope rearrangements fluxional tautomerism, aza-Cope rearrangements and Barton reaction.

Reference Books:

- 1) Advanced Organic Chemistry: Reactions Mechanisms and Structure by Jerry March, Mc.Graw Hill and Kogakush.
- 2) Molecular reactions and Photochemistry by Charles Dupey and O. Chapman, Prentice Hall.
- 3) Pericyclic reactions by S.N. Mukharji, Mcmilan.

14) Inorganic Materials of Industrial Importance(20214DSC26D).

Objectives:

The course introduces learners to the diverse roles of inorganic materials in the industry. It gives an insight into how these raw materials are converted into products used in day to day life. Students learn about silicates, fertilizers, surface coatings, batteries, engineering materials for mechanical construction as well as the emerging area of nano-sized materials. The course helps develop the interest of students in the frontier areas of inorganic and material chemistry.

Learning Outcomes:

By the end of the course, the students will be able to:

- Learn the composition and applications of the different kinds of glass. • Understand glazing of ceramics and the factors affecting their porosity.
- Give the composition of cement and discuss the mechanism of setting of cement. • Explain the suitability of fertilizers for different kinds of crops and soil.
- Explain the process of formulation of paints and the basic principle behind the protection

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offered by the surface coatings. • Explain the principle, working and applications of different batteries.


• List and explain the properties of engineering materials for mechanical construction used in day to day life.


• Explain the synthesis and properties of nano-dimensional materials, various semiconductor and superconductor oxides.

Unit 1 Silicate Industries Glass: Glassy state and its properties, classification (silicate and non-silicate glasses). Manufacture and processing of glass. Composition and properties of the following types of glasses: Soda lime glass, lead glass, armoured glass, different types of safety glass, borosilicate glass, fluorosilicate glass, coloured glass, photosensitive glass, photochromic glass, glass wool and optical fibre. Ceramics: Brief introduction to types of ceramics. glazing of ceramics. Cement: Manufacture of Portland cement and the setting process, Different types of cements: quick setting cements, eco-friendly cement (slag cement), pozzolana cement.

Unit 2: Fertilizers: Different types of fertilizers (N, P and K). Importance of fertilizers, chemistry involved in the manufacture of the following fertilizers: urea, ammonium nitrate, calcium ammonium nitrate, ammonium phosphates, superphosphate of lime, potassium chloride and potassium nitrate.

Unit 3: Surface Coatings: Brief introduction to and classification of surface coatings, paints and pigments: formulation, composition and related properties, pigment volume concentration (PVC) and critical pigment volume concentration (CPVC), fillers, thinners, enamels and emulsifying agents. Special paints: heat retardant, fire retardant, eco-friendly paints, plastic paints, water and oil paints. Preliminary methods for surface preparation, metallic coatings (electrolytic and electroless with reference to chrome plating and nickel plating), metal spraying and anodizing. Contemporary surface coating methods like physical vapor deposition, chemical vapor deposition, galvanising, carburizing, sherardising, boriding, nitriding and cementation.


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Unit 4: Batteries: Primary and secondary batteries, characteristics of an Ideal Battery, principle, working, applications and comparison of the following batteries: Pb- acid battery, Li-metal batteries, Li-ion batteries, Li-polymer batteries, solid state electrolyte batteries, fuel cells, solar cells and polymer cells.

Unit 5: Engineering materials for mechanical construction: Composition, mechanical and fabricating characteristics and applications of various types of cast irons, plain carbon and alloy steels, copper, aluminum and their alloys like duralumin, brasses and bronzes cutting tool materials, superalloys, thermoplastics, thermosets and composite materials.

References: Theory:

- West, A. R. (2014), Solid State Chemistry and Its Application, Wiley
- Smart, L. E.; Moore, E. A. (2012), Solid State Chemistry An Introduction, CRC Press Taylor & Francis.
- Atkins, P.W.; Overton, T.L.; Rourke, J.P.; Weller, M.T.; Armstrong, F.A.(2010), Shriver and Atkins Inorganic Chemistry, W. H. Freeman and Company.
- Kent, J. A. (ed) (1997), Riegel's Handbook of Industrial Chemistry, CBS Publishers, New Delhi.
- Poole Jr.; Charles P.; Owens, Frank J.(2003), Introduction to Nanotechnology, John Wiley and Sons.


15) Application of Computers in Chemistry(20214DSC26E),

COURSE CONTENTS:

Unit – I Introduction to Computers: Block diagram of computers; Input and output devices-key board, mouse, scanner, VDU, plotter, Types of printers; Primary & secondary memory - RAM, ROM, Secondary Memory devices-Hard Disk, CD, Flash Drive and Memory card; Volatile and non-volatile memory; CPU - ALU and control unit; Hardware & software, Software - system software and application software.

Unit – II


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Programming Languages, Number System and Operating System: Introduction to Algorithms and Flow charts, Programming languages - Machine, Assembly and high level language. Number System: Bits and Bytes, Decimal, binary and octal number system and their arithmetic. Operating system and its functions: Microsoft windows. Applications of Microsoft Office, Google classroom and Google meet.

Unit - III

C Programming: Introduction; Style of C language; Character set; keywords, data types, variables and constants in C; Operators-Arithmetic, Relational, Logical, Bitwise, Ternary, Cast and sizeof operators in C; Input and output statements in C language; Control and conditional statement in C; break and continue statement in loop. Storage classes in C; Functions (built in and user defined); Introduction to arrays.

Unit - IV

Computer applications in Physical and Analytical Chemistry: Listing the C-program for the following: Determination of rate constant of first order reactions, determination of rate constant for second order reactions, study of rate constant with variation of ionic strength, obtaining the heat of reaction using Hess's law of constant heat summation, obtaining the heat of reaction at different temperatures using Kirchoff's equation. Determination of Normality, Molarity and Molality of solutions, Determination of concentration using Beer- Lambert's law.

Unit - V

Computer applications in Inorganic and Organic Chemistry: Listing the C-program for the following: Determination of electronegativity of an atom from bond energy data using Pauling relation, determination of half life and average life of a radioactive nucleus. Determination of empirical formula of hydrocarbons and other organic compounds, Determination of molecular weights of organic compounds, Determination of molecular weights of organic compounds by Cryoscopic and ebullioscopic method. Determination of isoelectric point of amino acids. Chemdraw software and its applications.

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Suggested Readings:

1. Fundamentals of computer by V. Rajaraman
2. Programming in C (Schaum series outline) by Gotterfried.
3. "Computers in Chemistry" by K.V. Raman
4. Computer fundamentals and programming in C by Reema Thareja (2nd Edition)


16) Green Organic Synthesis: Principles and Applications(20214DSC35B),


Basic introduction and explaining goals of Green Chemistry. Limitations/Obstacles in the pursuit of the goals of Green Chemistry, Principles of Green Chemistry with their explanations and examples and special emphasis on Designing a Green Synthesis using these principles.

UNIT -Green Solvents, Supercritical fluids (SCFs), Super Critical Water (SCW), Supercritical Carbon Dioxide (SC-CO₂); Pyrolysis of t-butylbenzene, Pinacol-pinacolone rearrangement, Beckmann rearrangement, Diels-Alder reactions, Reduction of aromatic nitro compounds. Reaction in Supercritical Carbon Dioxide; Kolbe – Schmitt reaction, Friedel–Crafts reaction.

UNIT-II Solid state reaction at room temperature: Aldol condensation, Reformatsky reaction, Synthesis of quinoxaline derivatives. Microwave assisted solid state reactions using solid support: Synthesis of heterocyclic compounds; Synthesis of benzimidazole, Synthesis of oxazoles/thiazoles, Synthesis of oxadiazoles, Synthesis of N-arylated pyrrole derivatives, Synthesis of quinolones, Synthesis of furans.

UNIT- III Catalyst and Catalysis; Homogeneous catalysis, Heterogeneous catalysis, Catalysis in Green chemistry, Biocatalysis, Reactions using biocatalyst, Biocatalytic conversion of penicillin to 6- aminopenicillanic acid. Photocatalysis, Titanium dioxide (TiO₂) as a green photocatalyst for destroying organic pollutants, Some important photocatalytic applications of TiO₂ - Photocatalytic disinfection or sterilization.


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UNIT-IV Polymer supported catalysis - Reaction using polymer supported catalyst, Substitution reaction

Introduction; Oxidation-reduction reagents and catalysts; Biomimetic, multifunctional reagents;

UNIT-V Combinatorial green chemistry; Proliferation of solvent less reactions; Non-covalent derivatization; Biomass conversion, co crystal controlled solid state synthesis (C2S3).

Suggested Learning Resources: Books

1. Ahluwalia, V.K., Kidwai, M.R. New Trends in Green Chemistry, Anamalaya Publishers (2005).
2. Anastas, P.T. & Warner, J.K, Green Chemistry- Theory and Practical, Oxford University Press (1998).
3. Matlack, A.S. Introduction to Green Chemistry, Marcel Dekker (2001).
4. Cann, M.C. and Connely, M.E. Real-World cases in Green Chemistry, ACS (2000).
5. Ryan, M.A. and Tinnesand, M. Introduction to Green Chemistry, American Chemical Society, (2002).
6. Lancaster, M. Green Chemistry: An Introductory Text RSC Publishing, Second Edition, 2010

17) Macromolecules as Engineering Materials(20214DSC35C),

UNIT- I Polymers: Introduction, methods of polymerization: Condensation and Free radical with examples. Explanation of molecular weight determination by number average and weight average methods, numerical problems. Synthesis, properties and industrial applications of polyvinylchloride (PVC) and polystyrene.

UNIT-II Fibers: Introduction to fibers, synthesis, properties and industrial applications of Kevlar. Synthesis, properties and industrial applications of Polyester.

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UNIT-III Plastics: Introduction, Synthesis, properties and industrial applications of poly (methyl methacrylate) (PMMA), synthesis, properties and industrial applications of Teflon.

UNIT-IV Composites: Introduction to composites, properties and industrial applications of carbon-based reinforced composites (graphene/carbon nano-tubes as fillers) properties and industrial applications of metal matrix polymer composites.

UNIT-V Lubricants: Introduction, classification, properties and industrial applications of lubricants.

18) Pharmaceutical Inorganic Chemistry(20214DSC35D),


UNIT I □ Impurities in pharmaceutical substances: History of Pharmacopoeia, Sources and types of impurities, principle involved in the limit test for Chloride, Sulphate, Iron, Arsenic, Lead and Heavy metals,

UNIT-II modified limit test for Chloride and Sulphate General methods of preparation, assay for the compounds superscripted with asterisk (*), properties and medicinal uses of inorganic compounds belonging to the following classes

UNIT -III □ Acids, Bases and Buffers: Buffer equations and buffer capacity in general, buffers in pharmaceutical systems, preparation, stability, buffered isotonic solutions, measurements of tonicity, calculations and methods of adjusting isotonicity. Major electrolytes □ Intracellular electrolytes: Functions of major physiological ions, Electrolytes used in the replacement therapy: Sodium chloride*, Potassium chloride, Calcium gluconate* and Oral Rehydration Salt (ORS), Physiological acid base balance.

UNIT-V Dental products: Dentifrices, role of fluoride in the treatment of dental caries, Desensitizing agents, Calcium carbonate, Sodium fluoride, and Zinc eugenol


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cement. UNIT III 10 Hours □ Gastrointestinal agents Acidifiers: Ammonium chloride* and Dil. HCl Antacid: Ideal properties of antacids, combinations of antacids, Sodium

Recommended Books (Latest Editions)

1. A.H. Beckett & J.B. Stenlake's, Practical Pharmaceutical Chemistry Vol I & II, Stahlone Press of University of London, 4 th edition.
2. A.I. Vogel, Text Book of Quantitative Inorganic analysis
3. P. Gundu Rao, Inorganic Pharmaceutical Chemistry, 3 rd Edition
4. M.L Schroff, Inorganic Pharmaceutical Chemistry
5. Bentley and Driver's Textbook of Pharmaceutical Chemistry
6. Anand & Chatwal, Inorganic Pharmaceutical Chemistry

19) Industrial Pharmacy(20214DSC35E),

UNIT-I Pilot plant design: Basic requirements for design, facility, equipment selection, for tablets, capsules, liquid orals, parenteral and semisolid preparations. Scale up: Importance, Technology transfer from R & D to pilot plant to plant scale, process scale up for tablets, capsules, liquidorals, semisolids, parenteral, NDDS products – stress on formula, equipments, product uniformity, stability, raw materials, physical layout, input, in-process and finished product specifications, problems encountered during transfer of technology

UNIT-II

Validation: General concepts, types, procedures & protocols, documentation, VMF. Analytical method validation, cleaning validation and vendor qualification.

UNIT-III

Equipment Qualification: Importance, IQ, OQ, PQ forequipments – autoclave, DHS, membrane filter, rapid mixer granulator, cone blender, FBD, tablet compression machine, liquid filling and sealing machine. Aseptic room validation.

UNIT-IV

Process validation: Importance, validation of mixing, granulation, drying, compression, tablet coating, liquid filling and sealing, sterilization, water process systems,

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environmental control.

UNIT-V

Industrial safety: Hazards – fire, mechanical, electrical, chemical and pharmaceutical, Monitoring & prevention systems, industrial effluent testing & treatment. Control of environmental pollution.

REFERENCES

1. Pharmaceutical process validation, JR Berry, Nash, Vol 57, Marcel Dekker, NY.
2. Pharmaceutical Production facilities, design and applications, by GC Cole, Taylor and Francis.
3. Pharmaceutical project management, T. Kennedy, Vol 86, Marcel Dekker, NY.
4. The theory & Practice of Industrial Pharmacy, L. Lachman, H.A. Lieberman, Varghese Publ. Bombay.
5. Tablet machine instruments in pharmaceuticals, PR Watt, John Wiloy

20) Material Chemistry (20214DSC43B).

UNIT-I

Introduction to Materials Chemistry

UNIT-II

Different Types of Materials

UNIT-III

Materials in Advanced Technology


UNIT-IV


Materials for Energy Generation and Storage

UNIT-V

Miniaturization in Materials Science.

REFERENCE BOOK


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1] Introduction to Materials Chemistry, 2nd Edition Harry R. Allcock ISBN: 978-1-119-34725-5 October 2019

21) Pharmacology (20214DSC43C),

UNIT I

General Pharmacology:

a. Pharmacokinetics: The dynamics of drug absorption, distribution, biotransformation and elimination. Concepts of linear and non-linear compartment models. Significance of Protein binding.

b. Pharmacodynamics: Mechanism of drug action and the relationship between drug concentration and effect. Receptors, structural and functional families of receptors quantitation of drug receptors interaction and elicited effects.

UNIT II

Neurotransmission

a. General aspects and steps involved in neurotransmission.

b. Neurohumoral transmission in autonomic nervous system (Detailed study about neurotransmitters- Adrenaline and Acetylcholine).

c. Neurohumoral transmission in central nervous system (Detailed study about neurotransmitters histamine, serotonin, dopamine, GABA, glutamate and glycine).

d. Non-adrenergic non-cholinergic transmission (NANC). Cotransmission

Systemic Pharmacology A detailed study on pathophysiology of diseases, mechanism of action, pharmacology and toxicology of existing as well as novel drugs used in the following systems

Autonomic Pharmacology Parasympathomimetics and lytics, sympathomimetics and

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lytics, agents affecting neuromuscular junction UNIT III Central nervous system Pharmacology General and local anesthetics Sedatives and hypnotics, drugs used to treat anxiety, Depression, psychosis, mania, epilepsy, neurodegenerative diseases, Narcotic and non-narcotic analgesics, UNIT IV Cardiovascular

anti- Pharmacology Diuretics, antihypertensives, antiischemics, arrhythmics, drugs for heart failure and hyperlipidemia. Hematinics, coagulants, anticoagulants, fibrinolytics and antiplatelet drugs.

UNIT V

Autacoid Pharmacology The physiological and pathological role of Histamine, Serotonin, Kinins Prostaglandins Opioid autacoids. Pharmacology of antihistamines, 5HT antagonists. R22 M.Pharm Pharmacology JNTUH

REFERENCE BOOKS:

1. The Pharmacological Basis of Therapeutics, Goodman and Gillman's
2. Principles of Pharmacology. The Pathophysiological basis of drug Therapy by David E. Golan, Armen H, Tashjian Jr, Ehrin J, Armstrong, April W, Armstrong, Woiters, Kluwer-Lippincott Williams & Wilkins Publishers.
3. Basic and Clinical Pharmacology by B. G Katzung
4. Hand book of Clinical Pharmacokinetics by Gibaldi and Prescott.
5. Applied biopharmaceutics and Pharmacokinetics by Leon Shargel and Andrew B. C. Yu.
6. Graham Smith. Oxford textbook of Clinical Pharmacology.
7. Dipiro Pharmacology, Pathophysiological approach.
8. Advanced Pharmacology by Bilash Medhi. 1. Drugs and Cosmetics Act/Rules by Govt. of India Publications.

22) Herbal Drug Technology (20214DSC43D)

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Evaluation of Drugs WHO & ICH guidelines for the assessment of herbal drugs

Stability testing of herbal drugs. Patenting and Regulatory requirements of natural products:

a) Definition of the terms: Patent, IPR, Farmers right, Breeder's right, Bioprospecting and Biopiracy

b) Patenting aspects of Traditional Knowledge and Natural Products. Case study of Curcuma & Neem.

Regulatory Issues - Regulations in India (ASU DTAB, ASU DCC), Regulation of manufacture of ASU drugs - Schedule Z of Drugs & Cosmetics Act for ASU drugs.

UNIT-V

General Introduction to Herbal Industry Herbal drugs industry: Present scope and future prospects. A brief account of plant based industries and institutions involved in work on medicinal and


aromatic plants in India. Schedule T - Good Manufacturing Practice of Indian systems of medicine

Components of GMP.

Recommended Books: (Latest Editions)

1. Textbook of Pharmacognosy by Trease & Evans.
2. Textbook of Pharmacognosy by Tyler, Brady & Robber.
3. Pharmacognosy by Kokate, Purohit and Gokhale.
4. Essential of Pharmacognosy by Dr.S.H.Ansari
5. Pharmacognosy & Phytochemistry by V.D.Rangari
6. Pharmacopoeal standards for Ayurvedic Formulation (Council of Research in Indian Medicine & Homeopathy)
7. Mukherjee, P.W. Quality Control of Herbal Drugs: An Approach to Evaluation of Botanicals. Business Horizons Publishers, New Delhi, India, 2002.


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SCHOOL OF ARTS AND SCIENCE
DEPARTMENT OF ENGLISH
BOARD OF STUDIES MEETING CIRCULAR

DATE: 27.5.2022

There will be a Board of Studies Meeting on 6.6.22 at 10 a.m. in the department of English all the staffs must be attend the meeting.

Agenda
Curriculum
Feedback

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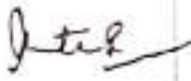
Ponnayyah Ramajayam Institute of Science and Technology
PRIST Deemed to be University
School of Arts and Science
Department of English
Minutes of the meeting of the Board of Studies (BoS)

Date : 6th May 2022
Venue : Seminar hall
Time : 10:00am to 2:00pm

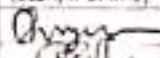
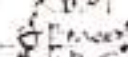


Members present:

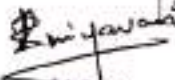
Chair: Dr.R.Iniyavan, Assistant Professor and Head, Department of English,
PRIST Deemed to be University, Vallam, Thanjavur

External Members

S.No.	Name/Degree/Designation	Institute/Organization/ Full address	Online/ Physical	Signature (scan, if online)
1	Dr.G.Arunachalam	Head & Professor Department of English,Raja Sarfoji government Arts and Science college.(AUTONOMOUS) Thanjavur	Physical	
2	Dr.R.Santhi	Associate Professor Department of English, School of Arts and Science, A.V.V.M Sri Pushpam college (AUTONOMOUS) POONDI	Physical	

Internal Members

S.No.	Name/Degree/Designation	Department	Online/ Physical	Signature (scan, if online)
1	Dr.R.Iniyavan	ENGLISH	Physical	
2	Mr.S.Rasakumar	ENGLISH	Physical	
3	Mr.S.Punniamoorthi	ENGLISH	Physical	
4	Miss. J.Subarna r	ENGLISH	Physical	



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Invited Participants

S No	Name/Degree/Designation	Department/Class Institute/Organization/Address	Online/ Physical	Signature (scan, if online)
1	Dr. L. Chinappa, MSc. MTech PhD Dean School of Arts and Science	Department of Physics, PRIST Deemed to be University, Vallam, Thanjavur	Physical	

Attendance List:

S.NO	Name	Designation
1	Dr. G. Arunachalam	Hod, Associate Professor of English , Raja Saraboji College, Thanjavur
2	Dr. R. Shanthi	Associate Professor of English, A.V.V.M. Sri Puspam Poondi
3	Prof.R. Iniyavan	Assistant professor , English
4	Prof.S. Rasa Kumar	Assistant professor , English
5	Prof. S.Punniya Moorthy	Assistant professor ,English
6	Prof. J.Subarna	Assistant professor ,English
7	A.SASIREKHA	Teacher at THAMARAI International Matriculation school, Thanjavur
8	Jenifer	I MA English


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SCHOOL OF ARTS AND SCIENCE

DEPARTMENT OF ENGLISH

MINUTES OF THE MEETING OF THE BOARD OF STUDIES (BOS)

Board: Department of English

The Meeting of Board of Studies (BOS) was held as given below:

Name of the Body	Board of Studies
Department	English
Meeting no	15
Date and Time	6.6.22
Venue	PRIST BLOCK, English department
Members Attended	The details are given in the ANNEXURE-I

AGENDA

1	Action taken on the previous Meeting Minutes.
2	Discussion made on employability oriented paper introduce
3	Discussion on the change of teaching method and introducing ICT class rooms
4	Discussion on the development and amends of the BA English Curriculum
5	Discussion on the development of the MA English Curriculum
6	Discussion on Value added courses and its material preparation
7	Any other matter discussions / suggestions / modifications given by Panel of examiner (Ug/Pg)
8	Other Discussions Made by the Board

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MINUTES OF THE BOARD OF STUDIES MEETING

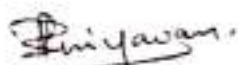
Board: ENGLISH

The Chairperson of BOS welcomed all the panel members for the meeting. The items listed in the agenda were taken for discussion.

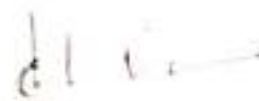
The 16th Board of Studies Meeting of the Department of English, School of Arts and Science, Ponnaiyah Ramajayam Institute of Science and Technology was conducted as per the guidelines of the University Grants Commission on 16.6.2023 at 11.00 am. The following members were attending the meeting.

Dr.R.Iniyavan, Chairperson of the Board of Studies Meeting welcomed the Members in his introducing speech; he explained the details of the Agenda and the academic matters to be discussed. The agenda of the meeting was taken up for discussion. The following points were discussed during the meeting. The resolutions made in the Meeting are given below.

The committee appreciated the formulation of syllabus for BA English programme to meet out the criteria of the Education Empowerment and Social Relevance. In Addition, the Committee suggested the following corrections/modifications/ Suggestions in the Programme syllabus. New courses and value added courses were introduced as per the request of the stake holders and BOS members.


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The following are the minutes of the meeting

Agendum 1: To confirm the minutes of BOS meeting held on 6.6.22

Discussion: The minutes of the Board of Studies meeting held on 6.6.22 were presented to the members. The suggestions received have been incorporated and placed for confirmation. The same was approved by the Academic council.

Resolution: The Board resolved to accept the same.

Agendum 2: Action taken on the previous Meeting Minutes

Discussion: Action taken report of the decisions made in the previous BOS and approved by the academic council. Action taken report was presented in the BOS.

Resolution:

The Board resolved to accept the same and improvement of students there were few value added courses are introduced which helpful to them to get job offers and enhancing their academic skills.

S.NO	COURSE NAME
1	Diploma course on Content writing
2	Diploma course on Radio Jockey
3	Certificate course on Accent Training
4	Diploma In Visual Narratives
5	Certificate Course In Business Communication

Agendum 3: The board members discussed on reducing the contents in the syllabus

Discussion: The board members discussed on the units contains lot of contents that seems huge for students. So the board decides to reduce the contents in BA English papers.

Agendum 4: Discussion held on semester wise syllabus of General English. English I and II have content change and English III&IV contents was reduced as per the suggestions received from the staff holders.

Discussion: The following courses were submitted to the board members:

Course Code	Course Title	L	T	P	C
22111AEC12	English-I	4	0	0	2
22111AEC22	English-II	5	0	0	3
22111AEC32	English-III	4	0	0	2
22111AEC42	English-IV	4	0	0	2


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 Valluvar Thuraiyur


 Head of Department
 Department of English
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Resolution: The board members recommended including technical English related exercises as supplementary materials for all units. The contents in every unit were discussed in the courses.

The board resolved to approve the finalized curriculum and contents.

Agendum 5: Discussion made on the BA English Literature syllabus its improvement

Discussion: A current curriculum for BA English was proposed with modifications to the committee and following points were discussed.

The following courses were submitted to the board members.

**BA ENGLISH- REGULATION 2022
COURSE STRUCTURE
SEMESTER - I**

Course Code	Course Title	L	T	P	C
THEORY					
22110AEC11/ 22111AEC11/ 22132AEC11/ 22135AEC11	Language-I (Tamil-I/ Advanced English-I/ Hindi-I/ French-I)	4	0	0	2
22111AEC12	English-I	4	0	0	2
22111AEC13	Literature in 1400-1600 Period	5	0	0	3
22111AEC14	Literature in Elizabethan Period	5	0	0	3
22111AEC15	Social History of England-I	4	0	0	3
22111AEC16	History of English Literature-I	5	0	0	4
Total -17					
AUDIT COURSE SEMESTER - II					
Course Code	Course Title	L	T	P	C
221ACLSUHV	Universal Human Values	-	-	-	2
Course Code	Course Title	L	T	P	C
THEORY					
22110AEC21/ 22111AEC21/ 22132AEC21/ 22135AEC21	Language-II (Tamil-II/ Advanced English-II / Hindi-II/ French-II)	4	0	0	2
22111AEC22	English-II	4	0	0	2
22111AEC23	Literature in Jacobean Period	5	0	0	3
22111AEC24	Literature in Restoration Period	5	0	0	4

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22111AEC25	Social History of England-II	4	0	0	3
22111AEC26	History of English Literature-II	5	0	0	4
RESEARCH SKILL BASED COURSE					
22111RILC27	Research Led Seminar	-	-	-	1
	Total				19
AUDIT COURSES					
221ACLSCOS	Communication Skills	-	-	-	2
221ACSSBBE	Basic Behavioral Etiquette	-	-	-	2
SEMESTER - III					
Course Code	Course Title	L	T	P	C
THEORY					
22110AEC31/ 22111AEC31/ 22132AEC31/ 22135AEC31	Language-III (Tamil-III/ Advanced English-III / Hindi-III/ French-III)	4	0	0	2
22111AEC32	English-III	4	0	0	2
22111AEC33	Literature in Augustan Period	4	0	0	3
22111AEC34	Literature in Romantic Period	4	0	0	3
22111SEC35	Literary Forms and Prosody	5	0	0	4
22111AEC36	Shakespeare	4	0	0	3
RESEARCH SKILL BASED COURSE					
22111RMC37	Research Methodology	2	0	0	2
	Total				19
AUDIT COURSE					
221ACLSOAN	Office Automation	-	-	-	2
SECOND YEAR					
SEMESTER - IV					
Course Code	Course Title	L	T	P	C
THEORY					
22110AEC41/ 22111AEC41/ 22132AEC41/ 22135AEC41	Language-IV (Tamil-IV/ Advanced English-IV/ Hindi-IV/ French-IV)	4	0	0	2
22111AEC42	English-IV	4	0	0	2
22111SEC43	Language and Linguistics	4	0	0	3
22111AEC44	Literature in Victorian Period	4	0	0	3
22111AEC46	Literary Criticism	5	0	0	4

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221ENSTU45	Environmental Studies	2	0	0	2
Total AUDIT COURSE					19
221ACLSLMS	Leadership and Management Skills	-	-	-	2
221ACSSAQA	General Aptitude and Quantitative Ability	-	-	-	2

THIRD YEAR

SEMESTER – V

Course Code	Course Title	L	T	P	C
THEORY					
22111AEC51	Literature in Modern Period-I	5	0	0	3
22111AEC52	American Literature	5	0	0	3
22111SEC53	English Language Teaching	5	1	0	5
22111SEC54	Translation	5	1	0	4
22111DSC55	Discipline Specific Elective - I	5	0	0	3
RESEARCH SKILL BASED COURSE					
22122BRC57	Participation in Bounded Research	-	-	-	1
Total					19
AUDIT COURSE					
221ACLSPSL	Professional Skills	-	-	-	2
					2

THIRD YEAR - SEMESTER – VI

Course Code	Course Title	L	T	P
THEORY				
22111AEC61	Literature in Modern Period-II	5	0	0
22111AEC62	Indian Writing in English	5	0	0
22111AEC63	Commonwealth Literature	5	1	0
22111DSC64	Discipline Specific Elective -II	5	0	0
221__OEC(2 Digit Course Name)	Open Elective	4	0	0
22112PRW65	Project Work	-	-	-

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22111PEE	Programme Exit Examination	-	-	-
AUDIT COURSE				
221AFCSSIST	Interview Skills Training And Mock Test	2		
221ACLSCET	Community Engagement	1		
	Total Credits Programme	116		
	Total Credits Audit Courses	19		

DECIPILINE SPECIFIC ELECTIVIES

S.N .O	Program me name	Programm e Name	Subject code	Subject Name	Semester
1	22UGEN GGE	BA English	22111DSC55B	Single Author Study- Girish Karnad	V
2	22UGEN GGE	BA English	22111DSC55C	Single Author Study- Arundhati Roy	V
3	22UGEN GGE	BA English	22111DSC55D	Single Author Study- Chinua Achebe	V
4	22UGEN GGE	BA English	22111DSC55E	Single Author Study- Khalil Gibran	V
5	22UGEN GGE	BA English	22111DSC64A	French Literature	VI
6	22UGEN GGE	BA English	22111DSC64B	Medieval Literature	VI
7	22UGEN GGE	BA English	22111DSC64C	Modernism and Post Modernism	VI
8	22UGEN GGE	BA English	22111DSC64D	Australian Literature	VI

Agendum 6: Discussion made on the Value added courses and its syllabus

Sl.No	Course code	Name of the course
1	22DCW101	Diploma in Content Writing
2	22DVN102	Diploma in Visual Narratives
3	22CAT101	Certificate course in Accent Training

Agendum 7: Discussion made on the MA English Literature syllabus ,its improvement

Discussion: A current curriculum for MA English was proposed with modifications to the committee and following points were discussed. Discipline Specific Elective Courses were introduced on self choice pattern. Here students are free to use their free will to select a particular paper, according to their

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**Discipline Specific Electives (PG)
NEW COURSES**

S.N. O	Programme Code	Programme Name	Subject Code	Subject name	Semester
1	22PGENGGE	MA English	22211DSC15A	British Poetry I: Chaucer to Hopkins	I
2.	22PGENGGE	MA English	22211DSC15B	British Fiction I: Victorian to Early Modern	I
3.	22PGENGGE	MA English	22211DSC15C	British Drama-I: Elizabethan Age	I
4	22PGENGGE	MA English	22211DSC15D	American Poetry-I	I
5	22PGENGGE	MA English	22211DSC25A	British Poetry II: Yeats to The Present Times	II
6	22PGENGGE	MA English	22211DSC25B	British Fiction II: Late Modern To Post-Modern	II
7	22PGENGGE	MA English	22211DSC25C	British Drama-II	II
8	22PGENGGE	MA English	22211DSC25D	American Poetry- II	II
9	22PGENGGE	MA English	22211DSC34A	Shakespeare Film Studies	III
10	22PGENGGE	MA English	22211DSC34B	Ben Johnson-work studies	III
11	22PGENGGE	MA English	22211DSC34C	Christopher Marlow work studies	III
12	22PGENGGE	MA English	22211DSC34E	George Bernard Shaw- work studies	III
13	22PGENGGE	MA English	22211DSC44A	Literary Terms and style	IV
14	22PGENGGE	MA English	22211DSC44B	Epics in Translation	IV

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15	22PGENGGE	MA English	22211DSC44C	English for Career	IV
16	22PGENGGE	MA English	22211DSC44D	Approaches to Teaching in Literature	IV

Signature: 

Chair/HoD

Dept: ENGLISH

Name: F INIYAVAN

Date: 06/05/22

Signature: 

Dean:

School: School of Arts & Science
Ponnaiyah Ramajayam Institute of
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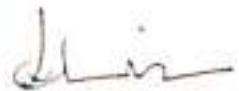
Name: Deemed to be University

Date:

1. Minutes of the previous BoS meeting minutes and report on the follow-up action taken.
2. BoS Meeting 'Notification' sent to all members, including online meeting link.
3. Online Screenshots and geo-tagged photos in the venue.
4. Attendance sheet print of online attendees.
5. Detailed syllabi with PEOs, POs, COs, etc. (in Annexures), if new Programme(s) introduction /Curriculum revision is discussed.

Note: The 'minutes' of the BoS meeting along with the attachments as listed above must be mailed to the Registrar by the HoD within three days after the meeting, copying Dean concerned, Dean - Academic Affairs and the VC's office.


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VALUE ADDED COURSES

1. DIPLOMA IN CONTENT WRITING
2. DIPLOMA IN RADIO JOCKEY
- 3 CERTIFICATE COURSE IN ACCENT TRAINING
- 4 DIPLOMA IN VISUAL NARRATIVES
- 5 CERTIFICATE COURSE IN BUSINESS COMMUNICATION

DIPLOMA IN CONTENT WRITING

Objectives:

Learn to generate traffic and sales by writing effective content.

Course Outcome:

Learn how to write appealing content that attracts a lot of readers.

Course Content:

Unit I: Basics of Content writing - The Concept of Content Writing and its relevance, Role and Functions of Content Writers

Unit II: Types of Content writing - The process of Content Writing, Editing and Proof-Reading, Writing blogs, case studies, white papers

Unit III: Visual Content – Infographics, Product Demonstrations

Interactive Content – Quizzes, Polls, Interactive white papers

Unit IV: Tools of the trade - Social Media- Understanding the basics of social media,

Understanding social media content writing, Understanding PR

Unit V:

Plagiarism laws in Content Writing- What is plagiarism, rules on plagiarism, How to write plagiarism-free copies

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DIPLOMA IN RADIO JOCKEY

Objectives

Make Confident, Creative and personality ability to do multi-tasking by handling public relations
To Roles ranged from supervising producers and appeared on a number of TV shows for making
people aware of career choices as a Radio Jockey

Outcome

To enhance, correct breathing techniques, pronunciation, modulation, projection etc.
To enrich correct body language and flow of language

Unit-I- Effectively make airlines, weather and railway announcements

Unit-II- Effectively write/present interesting Radio Scripts & how to read the news on Radio &
TV

Unit-III- How to get over the fear of public speaking & Professional Presentation & correct body
language

Unit-IV- Narration, cartoon and lip sync dubbing (Theory only)

Unit-V- E-Book Narration- How to narrate & explore the upcoming E- book market boom

CERTIFICATE COURSE IN ACCENT TRAINING

Objectives:

Segmental and suprasegmental aspects of pronunciation
Phonemes and sounds in isolation

Course Outcome:

Ability to understand English spoken by native speakers
Ability to speak in a more neutral fashion
Increased career growth opportunities, Improved self-confidence


Course Content:

Unit I:

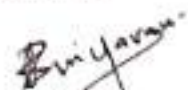
Foundations of Narrative Design

Unit II:

Visual Storytelling - Storytelling Structure: Time and Space, Interactive Storytelling


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Unit III:

Advertising, Branding, and Information Design

Unit IV:

Computers, Multimedia, and World Building

Unit V:

Neutral Accent and its types

DIPLOMA IN VISUAL NARRATIVES

Objectives:

Using elements of visual language effectively

Course Outcome:

Developing new uses and functions for word and image based storytelling

Course Content:


Unit I: Visual storytelling techniques - to create dynamic imagery that conveys mood and emotion

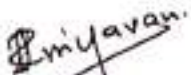
Unit II: Media, image making drawing instruments - critical reflection on narrative as a visual form

Unit III: Analysis of essential drawing systems and techniques - "Glossary of Film Terminology" (Golden) Analyze Once Upon a Time in the West as a visual narrative

Unit IV: Compositional design and conceptualise scenes -L. anguage of drawing, film, comics and sequential images

Unit V: Animation - The Principles of Animation (Thomas&Johnston), Animation processes and studios, Analyze animated works as visual narratives


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CERTIFICATE COURSE IN BUSINESS COMMUNICATION

Objectives

Exchanging information, knowledge, ideas, thoughts and messages between individuals or groups in organizations.

Outcome

Applies the knowledge by speaking confidently and communicating effectively in different business situations.

CONTENTS:

Unit- I- Introduction

Importance of communication skills in Business Management

Types of communication

The media and tools of communication.

Unit II – Verbal and Non-verbal Communication

Personal language and body language.

Types of managerial speeches: occasional speech; thematic speech.

Group Communication in: group discussions, meetings, seminars, and conferences.

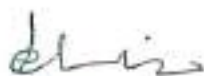
Art of facing interviews in: selection or placement, appraisal, disciplinary committees

Unit III – Written Communication Skills

Formats for business letters and memos, Job applications, Preparing a Follow-up messages and letters, Writing effective Business Reports Digital Communication-Using Web sources of knowledge Sharing.

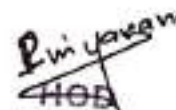
Unit IV – Recruitment and Employment Correspondence letter of Acceptance, Letter of Resignation and Promotion, Testimonials and References.

Unit V – Business and Social Etiquette Workplace hierarchy, appropriate business attire, Telephone Etiquette, table etiquette. Language lab class for practical communication.



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UG- B.A ENGLISH NEW COURSES

SINGLE AUTHOR STUDY- GIRISH KARNAD

UNIT- I

A Bird's Eye View
Crossing to Talikota

UNIT- II

Wedding Album,
Bali : The Sacrifice

UNIT-III

Fire and the Rain
Boiled Beans on Toast

UNIT-IV

Yayati

UNIT- V

The Dreams of Tipu Sultan

SINGLE AUTHOR STUDY- ARUNDHATHI ROY

UNIT-I

The cost of living

The shape of the beast

UNIT-II

War Talk

The doctor and the saint

UNIT-III

Walking with the comrade

Listening to the Grasshoppers

UNIT- IV

P. S. Srinivasan
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J. Srinivasan
Dean

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Power Politics

UNIT V

The Ordinary Person's Guilt to Empire

SINGLE AUTHOR STUDY- CHINUA ACHEBE

UNIT-I

The trouble with Nigeria

UNIT-II

There was a Country

UNIT-III

Home and Exile

UNIT- IV

The Man of People

UNIT-V

Chike the River

SINGLE AUTHOR STUDY-KHALIL GIBRAN

UNIT-I

Sand and Foam

UNIT- II

The Madman

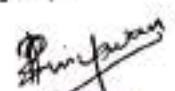
UNIT- III

Tears and Laughter

UNIT- IV

Nymphs of the Valley

UNIT - V


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The Wanderer

FRENCH LITERATURE

UNIT- I

Introduction to French Literature

UNIT- II

Classical French Literature

Enlightenment and 18th Century Literature

UNIT-III

French Romanticism

UNIT- IV

Realism and Naturalism

UNIT- V

Symbolism and Modernism

MEDIEVAL LITERATURE

UNIT-I

The not-so 'dark' age Already rewriting history: Gildas

UNIT-II

Old Celtic literature Old Welsh: 'Y Gododdin' (pp. 9-15), Middle Welsh: 'Caru Merch Fonheddig – Wooing a Noble Girl' by Dafydd ap Gwilym (14th c.; handout) compare to 'The Flea' by John Donne publ. 1633 (handout) Old Irish: 'Messe ocus Pangur Bán' (poet's selfie with cat) (pp.

UNIT-III

Literature as Propaganda 'The Battle of Maldon'

Saint's Lives: 'The Passing of Mary of Egypt' (on line) 23 Sermons: Wulfstan the Homilist's 'Sermo Lupi ad Anglos'

UNIT- IV

Middle English Lyrics: Geoffrey Chaucer 'Parliament of Fowles'

B. Subramanian
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UNIT-V

The Medieval 'Startrek': Term paper due; extract from Robert Manning of Brunne, Handlyng Synne

MODERNISM AND POSTMODERNISM

UNIT-I

Fitzgerald- The Great Gatsby

UNIT-II

Ellison- Invisible Man

UNIT-III

Auster-City of Glass

UNIT-IV

Jackson Patchwork Girl

UNIT-V

Coover –The End of Books

Landow –Reconfiguring Narrative

AUSTRALIAN LITERATURE

UNIT- I

Australian Literature. –Australia-Land and History
People and Culture.

UNIT- II

Literary Beginnings-Oral Literature, Early Literature.

UNIT- III

Themes and Trends

UNIT- IV

Peter Carey- True History of the Kelly Gang

UNIT- V

Dorothy Porter- The Monkey's Mask

P. Anil Kumar
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P.G. M.A ENGLISH NEW COURSES
BRITISH POETRY I: CHAUCER TO HOPKINS

UNIT- I

Introduction- Survey of English literature from: Chaucer to 19th century-landmarks-major writers-themes and concerns-socio-political developments.

UNIT- II

Geoffrey Chaucer: Canterbury Tales (selections)

- "The General Prologue"
- "The Wife of Bath's Tale"
- "The Pardoner's Tale"

UNIT- III

- Sir Thomas Wyatt: sonnets (selections)
- Henry Howard, Earl of Surrey: sonnets (selections)
- Edmund Spenser: Amoretti (selections)

UNIT- IV

Sonnets (selections)

- Narrative poems: Venus and Adonis, The Rape of Lucrece

UNIT- V

John Donne: poems (selections)

- "The Sun Rising"
- "The Ecstasy"
- "Death Be Not Proud"
- "The Wreck of the Deutschland"
- "God's Grandeur"

BRITISH FICTION I: VICTORIAN TO EARLY MODERN

UNIT- I

Charlotte Brontë: Author of Jane Eyre

UNIT- II

Charles Dickens: Great Expectations,

UNIT- III

George Eliot: Middlemarch


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UNIT- IV

Thomas Hardy: The Mayor of Casterbridge,

UNIT- V

HG Wells: The Time Machine

BRITISH DRAMA-I: ELIZABETHAN AGE

UNIT- I

The Spanish Tragedy: Thomas Kyd

UNIT -II

Gorboduc- Sackville and Norton

UNIT -III

The Shoemaker's Holiday: Thomas Dekker

UNIT -IV

King John- William Shakespeare

UNIT - V

Dr. Faustus-Christopher Marlowe

AMERICAN POETRY-I

UNIT- I

Morton- New English Canaan

UNIT- II

Samuel Danforth – Almanacks

UNIT -III

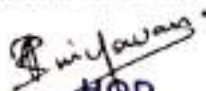
Phillis Wheatley, - Poems on Various Subjects


UNIT- IV

Henry Wadsworth Longfellow –The Song of Hiawatha

UNIT -V

James Russell Lowell- Southern Literary Messenger


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BRITISH POETRY II: YEATS TO THE PRESENT TIMES

UNIT- I

The Red Wheelbarrow- William Carlos Williams

UNIT- II

The Love Song of J. Alfred Prufrock - T.S. Eliot

UNIT- III

The Man He Killed: Thomas Hardy

UNIT- IV

In a Station of the Metro- Ezra Pound

UNIT- V

A Shropshire Lad -A.E. Housman,

BRITISH FICTION II: LATE MODERN TO POST-MODERN

UNIT- I

Howards End- E.M. Forster

UNIT- II

White Teeth- Zadie Smith

UNIT- III

Atonement- McEwan touches

UNIT- IV

Jude the Obscure- Thomas Hardy

UNIT- V

Life After Life- Kate Atkinson

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BRITISH DRAMA – II

UNIT – I

Look Back in Anger- John Osborne

UNIT- II

Major Barbara- George Bernard Shaw

UNIT- III

She Stoops to Conquer- Oliver Goldsmith

UNIT- IV

Long Day's Journey into Night- Eugene O'Neill,

UNIT – V

A Doll House - Henrik Ibsen

AMERICAN POETRY – II

UNIT- I

On Imagination- Phillis Wheatley

UNIT- II

Why, Oh Why, the Doily? -Janice N. Harrington

The Fish - Elizabeth Bishop

UNIT- III

To speak of woe that is in marriage – Robert Lowell

The pink dog – Elizabeth bishop

UNIT- IV

Daddy -Sylvia Plath

UNIT – V

Dream song I – John Berryman

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SHAKESPEARE FILM STUDIES

UNIT- I

Midsummer Night's Dream

UNIT- II

Much Ado About Nothing

UNIT- III

Richard III

UNIT- IV

Coriolanus

UNIT- V

Romeo and Juliet

BEN JOHNSON- WORK STUDIES

UNIT - I

The silent woman

UNIT- II

Epicoene

UNIT - III

Bartholomew Fair

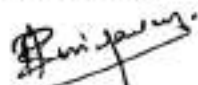
UNIT - IV

To Penshurst & To Celia

The forest

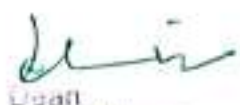
UNIT - V

Discoveries



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CHRISTOPHER MARLOW – WORK STUDIES

UNIT – I

Edward III

UNIT –II

Faust

UNIT –III

Blank verse

UNIT –IV

Hero and The Leander

UBIT – V

Doctor Faustus

GEORGE BERNARDSHAW- WORK STUDIES

UNIT-I

Passion Play

UNIT – II

Love Among the Artists

UNIT – III

The Miraculous Revenge

How he lied to her husband

UNIT –IV

Fabian essays in socialism

UNIT – V

The Quintessence of Ibsenism

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LITERARY TERMS AND STYLE

UNIT I - Literary Terms

UNIT II: Poetry & Types

UNIT III: Prose & Types

UNIT - IV: Drama & Types

UNIT -V Fiction & Types

EPICS IN TRANSLATION

UNIT- I

Thirukkural – Athigaram 123

UNIT-II

Kamparamayanam- sundrankandam

UNIT- III

Mhabaratham- Krishna Upathesam

UNIT-IV

Sivagasinthamani – Kunamalayar Innampagam

UNIT – V

Silappathigaram - Nadu Kan kathai

ENGLISH FOR CAREER

UNIT-I

Entering the job market

UNIT-II

Resumes , module

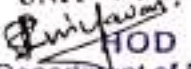
UNIT- III

Writing Cover letters

UNIT-IV

Networking

UNIT- V : Interviewing for the jobs


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APPROACHES TO TEACHING IN LITERATURE

UNIT- I

Language-based approach: Literature is used as a resource for learning a language.

UNIT- II

Communicative Language Teaching (CLT) approach:

UNIT- III

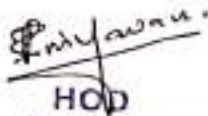
Literary theories:

UNIT -IV

Moral-philosophical approach, Information-based approach

UNIT- V

Paraphrastic approach, Stylistic approach:



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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
Minutes of the meeting of the Board of Studies (BoS)

Date: 06.03.2022

Venue: CSE ICT CLASSROOM

Time: 10.30 a.m

Members present:

Chair: Prof.Dr. Dr.R.Latha, Ph.D, HOD/CSE

(<https://meet.google.com/qfs-xyxx-hmf>)

External Members

S.No	Name/Degree/Designation	Institute/Organization/ Full address	Online/ Physical	Signature (scan, if online)
1	Dr. S.A.SAHAAYA ARUL MARY	Professor and Head of CSE Department, Saranathan College of Engineering	Online	
2	Mr.V. PRASANNA VENKATESH	Senior Data Analyst STAPLES Inc. USA	Online	



Internal Members

S.No.	Name/Degree/Designation	Department	Online/ Physical	Signature (scan, if online)
1.	Dr.R.Latha HOD/CSE	CSE	Physical	
2.	Prof.Dr.S.Nithyanandam Ph.D	CSE	Physical	
3.	Prof.S JANCY SICKORY DAISY, M.Tech, Assistant Professor	CSE	Physical	
4.	Prof.K.JAYANTHI, M.E, Assistant Professor	CSE	Physical	
5.	Prof.Dr.L.S. Usharani Ph.D, Professor	CSE	Physical	
6.	Prof.Dr.N.Arularasan Ph.D/ Associate Professor	CSE	Physical	
7.	Prof.R.Tamizhselvan M.E, Dean	MECH	Physical	
8.	Dr.K.Padmapiya Ph.D/ Associate Professor	CSE	Physical	

Head of the Department
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Invited Participants

S.No.	Name/Degree/Designation	Department/Class Institute/Organization/Address	Online/ Physical	Signature (scan, if online)
1	Mr.Naveen B.E/ Data center Architect	TCS, Chennai	Physical	
2	Mr.N.Mohamed Wasif	Student	Physical	

Agenda:

1. To Confirm the previous Meeting Minutes
2. To discuss the action taken on the previous Meeting Minutes
3. To scrutinize the stakeholder feed backs on B. Tech (FT/PT).
4. To Introduce new programme of B. Tech Artificial Intelligence and Data Science.
5. To recommend the panel of Examiners for B. Tech(FT/PT).
6. To recommended to value added courses conducting for B.Tech CSE & AIDS student.
7. To Introduce new courses for B.Tech (PT),M.Tech(PT&FT)


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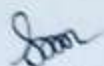
MINUTES OF THE MEETING

At the outset, the Chairman BOS welcomed the members for attending the meeting of the Board of Studies. In her introductory remarks, she described the agenda items.

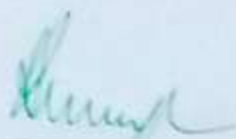
Agendum 1:
Discussion: To confirm the previous BOS Meeting Minutes and to discuss the action taken on the previous BoS Meeting Minutes.
Resolution: The chairman confirmed the previous meeting minutes of BoS and discussed the action taken on the previous BOS Meeting Minutes.
Agendum 2:
Discussion: To scrutinize the abstract of stakeholders feedback on existing curriculum and syllabi for B.TECH-CSE (Full Time/Part Time) and M.Tech-Computer Science and Engineering((Full Time/Part Time).
Resolution: The members of the Board thoroughly scrutinized the existing curriculum and syllabi and the abstract of stakeholders feedback on B.TECH-CSE (Full Time/Part Time) and M.Tech-Computer Science and Engineering (Full Time/Part Time) and resolved to revise the curriculum in the subsequent syllabus revision.
Agendum 3:
Discussion: To introduce 12 new courses for B.Tech (PT), 8 new courses for M.Tech (FT) and also 8 new courses for M.Tech (PT) CSE
Resolution: The members of the board also scrutinized and updated the new courses.
Agendum 4:
Discussion: To Introduce a new programme of B.Tech Artificial Intelligence and Data Science.
Resolution: The members of the board have unanimously recommended to introduce the Introduce new programme of B.Tech Artificial Intelligence and Data Science.
Agendum 5:
Discussion: To recommend the panel of Examiners for B.Tech(FT/PT) and for M.Tech-Computer Science and Engineering(FT/PT)
Resolution: The members of the board also scrutinized and updated the panel of examiners and recommended the panel of examiners for the B.TECH -CSE (FT/PT) & M.Tech-Computer Science and Engineering(FT/PT), and submitted the same for the Academic Council for its approval.
Agendum 6:
Discussion: To recommend the value added courses conducting for B.Tech CSE & AIDS student
B.Tech-CSE <ul style="list-style-type: none">➤ Virtual Reality➤ Software Testing Automation➤ Neural Networks➤ Deep Learning
B.Tech-AI&DS <ul style="list-style-type: none">➤ Introduction to Java➤ Web Development

List of new courses

B.Tech(PT) CSE	Problem Solving and Python Programming	22150C15P
B.Tech(PT) CSE	Programming in C	22150C22P
B.Tech(PT) CSE	Software Engineering Fundamentals	22150H41P
B.Tech(PT) CSE	Internet Programming	22150H42P
B.Tech(PT) CSE	Cryptography and Network Security	22150H61P
B.Tech(PT) CSE	Grid and Cloud Computing	22150H72P
B.Tech(PT) CSE	Data Warehousing and Data Mining	22150E44BP
B.Tech(PT) CSE	Professional Ethics in Engineering	22150E44CP
B.Tech(PT) CSE	Graph Theory And Applications	22150E64CP
B.Tech(PT) CSE	Cyber Forensics	22150E74DP
B.Tech(PT) CSE	Information Retrieval Techniques	22150E74BP
B.Tech(PT) CSE	Ad hoc and Sensor Networks	22150E54AP
M.Tech(FT) CSE	Machine Learning Techniques	22250H13
M.Tech(FT) CSE	Internet of Things	22250H23
M.Tech(FT) CSE	Web Engineering	22250E16B
M.Tech(FT) CSE	Information Retrieval Techniques	22250E24C
M.Tech(FT) CSE	Language Technologies	22250E25C
M.Tech(FT) CSE	Speech Processing and Synthesis	2225E32B
M.Tech(FT) CSE	Reconfigurable Computing	22250E33B
M.Tech(FT) CSE	Bio-inspired Computing	22250E34B
M.Tech(PT) CSE	Internet of Things	22250H22P
M.Tech(PT) CSE	Machine Learning Techniques	22250E32P
M.Tech(PT) CSE	Information Retrieval Techniques	22250E23CP
M.Tech(PT) CSE	Speech Processing and Synthesis	22250E51BP
M.Tech(PT) CSE	Reconfigurable Computing	22250E52BP
M.Tech(PT) CSE	Bio-inspired Computin	22250E53BP
M.Tech(PT) CSE	Web Engineerin	22250E33BP
M.Tech(PT) CSE	Language Technologies	22250E23DP



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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

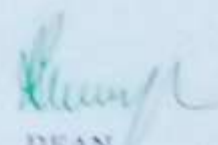
PROGRAM HANDBOOK

B.TECH-CSE(PART-TIME)

[REGULATION 2022]

B.Tech, Part Time (Computer Science and Engineering)


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

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SEMESTER-I

Subject Code	Subject Name	Periods Per Week			C
		L	T	P	
22148S11P	Transforms and Partial Differential Equations	3	1	0	4
22152S12P	Digital Systems	3	1	0	4
22150H13P	Data Structures and algorithms	3	1	0	4
22150H14P	Computer Architecture and Organization	3	1	0	4
22150H15P	Problem Solving And Python Programming	3	0	0	3
Total No. of credits					19

SEMESTER-II

Subject Code	Subject Name	Periods Per Week			C
		L	T	P	
22148S21P	Numerical Methods	3	1	0	4
22150H22P	Microprocessors and Interfacing	3	1	0	4
22150H23P	Database Management Systems	3	1	0	4
22150H24P	Design and Analysis Of Algorithm	3	1	0	4
22150H25P	Programming in C	3	0	0	3
Total No. of credits					19


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SEMESTER- III

Subject Code	Subject Name	Periods Per Week			C
		L	T	P	
22148S31P	Discrete Mathematics	3	1	0	4
22150H32P	Operating System	4	0	0	4
22150H33P	Artificial Intelligence	4	0	0	4
22150H34P	Computer Networks	4	0	0	4
22150L35P	Operating Systems and Networking Lab	0	0	3	2
Total No. of credits					18

SEMESTER - IV

Subject Code	Subject Name	Periods Per Week			C
		L	T	P	
22150H41P	Software Engineering Fundamentals	3	1	0	4
22150H42P	Internet Programming	3	1	0	4
22150H43P	C# And .Net Framework	3	1	0	4
221 E44 P	Elective-I	3	1	0	4
22150L45P	Internet Programming Lab	0	0	3	2
Total No. of credits					18


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SEMESTER - V

Subject Code	Subject Name	Periods Per Week			C
		L	T	P	
22150H51P	Object Oriented Analysis and Design	4	0	0	4
22150H52P	Software Quality Management	3	1	0	4
22150H53P	Graphics and Multimedia	3	1	0	4
221_E54_P	Elective -II	3	1	0	4
22150L55P	Software Development Lab	0	0	3	2
Total No. of credits					18

SEMESTER - VI

Subject Code	Subject Name	Periods Per Week			C
		L	T	P	
22150H61P	Cryptography and Network Security	4	0	0	4
22150H62P	Advanced Java programming	3	1	0	4
22150H63P	Software Testing	4	0	0	4
221_E64_P	Elective III	4	0	0	4
22150L65P	Java Programming Lab	0	0	3	2
Total No. of credits					18

SEMESTER - VII

Subject Code	Subject Name	Periods Per Week			C
		L	T	P	
22160S71P	Total Quality Management	3	0	0	3
22150H72P	Grid and Cloud Computing	4	0	0	4
22150H73P	Middleware Technologies	3	1	0	4
221_E74_P	Elective IV	3	0	0	3
22150P75P	Project	0	0	12	6
Total No. of credits					20



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LIST OF ELECTIVES

SEMESTER - IV (ELECTIVE I)

Subject Code	Subject Name	Periods Per Week			C
		L	T	P	
22150E44AP	Theory of Computation	3	1	0	4
22150E44BP	Data Warehousing and Data Mining	3	1	0	4
22150E44CP	Professional Ethics in Engineering	3	1	0	4
22150E44DP	Advanced Databases	3	1	0	4


SEMESTER - V (ELECTIVE II)

Subject Code	Subject Name	Periods Per Week			C
		L	T	P	
22150E54AP	Ad hoc and Sensor Networks	3	1	0	4
22150E54BP	Principles of Compiler Design	3	1	0	4
22150E54CP	Distributed Systems	3	1	0	4
22150E54DP	Mobile Computing	3	1	0	4

SEMESTER - VI (ELECTIVE III)

Subject Code	Subject Name	Periods Per Week			C
		L	T	P	
22160E64AP	Principles of Management	4	0	0	4
22150E64BP	Unix Internals	4	0	0	4
22150E64CP	Graph Theory And Applications	4	0	0	4
22150E64DP	Programming paradigms	4	0	0	4


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SEMESTER - VII (ELECTIVE VI)

Subject Code	Subject Name	Periods Per Week			C
		L	T	P	
22150E74AP	High Speed Networks	3	0	0	3
22150E74BP	Information Retrieval Techniques	3	0	0	3
22150E74CP	Software Project Management	3	0	0	3
22150E74DP	Cyber Forensics	3	0	0	3


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CREDITS DISTRIBUTION

Semester	Theory Courses		Elective Courses		Practical Courses		Project	Total Credit
	Nos	Credit	Nos	Credit	Nos	Credit	Credit	
I	5	19	-	-	-	-	-	19
II	5	19	-	-	-	-	-	19
III	4	16	-	-	1	02	-	18
IV	3	12	1	04	1	02	-	18
V	3	12	1	04	1	02	-	18
VI	3	12	1	04	1	02	-	18
VII	3	11	1	03	-	-	06	20
Total Credits								130

TOTAL CREDITS	
Semester - I	19
Semester - II	19
Semester - III	18
Semester - IV	18
Semester - V	18
Semester - VI	18
Semester - VII	20
TOTAL CREDITS	130


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OBJECTIVES:

On completion of the class, a student should be able:

- To know the basics of algorithmic problem solving
- To read and write simple Python programs.
- To develop Python programs with conditionals and loops.
- To define Python functions and call them.
- To use Python data structures -- lists, tuples, dictionaries.

UNIT-I ALGORITHMIC PROBLEM SOLVING

9

Algorithms, building blocks of algorithms (statements, state, control flow, functions), notation (pseudocode, flowchart, programming language), algorithmic problem solving, simple strategies for developing algorithms (iteration, recursion). Illustrative problems: find minimum in a list, insert a card in a deck, guess an integer number in a range, Towers of Hanoi

UNIT-II DATA, EXPRESSIONS, STATEMENTS

9

Python Interpreter and interactive mode; values and types: int, float, boolean, string, and list; variables, expressions, statements, tuple assignment, precedence of operators, comments; modules and functions, function definition and use, flow of execution, parameters and arguments; Illustrative programs: exchange the values of two variables, calculate the values of n variables, distance between two points.

UNIT-III CONTROLFLOW, FUNCTIONS

9

Conditionals: Boolean values and operators, conditional (if), alternative (if-else), chained conditional (if-elif-else); Iteration: state, while, for, break, continue, pass; functions: return values, parameters, local and global scope, function composition, recursion; Strings: string slices, immutability, string functions and methods, string module; Lists as arrays. Illustrative programs: square root, gcd, exponentiation, sum an array of numbers, linear search, binary search.

UNIT-IV LISTS, TUPLES, DICTIONARIES

9

Lists: list operations, list slices, list methods, list loop, mutability, aliasing, cloning lists, list parameters; Tuples: tuple assignment, tuple as return value; Dictionaries: operations and methods; advanced list Processing -- list comprehension; Illustrative programs: selection sort, insertion sort, merge sort, histogram.

UNIT-V FILES, MODULES, PACKAGES

9

File and exception: text files, reading and writing files, format operator; command line arguments, errors and exceptions, handling exceptions, modules, packages; Illustrative programs: word count, copy file.

TOTAL: 45 PERIODS**Text Book:**

Balagurusamy E, "Object Oriented Programming with C++", 3/E, TMG, 2006.

Reference :

1. Hubbard, "Programming with C++", 2/e, Schaum Outline Series, TMH, 2006.
2. Bjarne Stroustrup, "The C++ Programming Language", Addison Wesley Publications, Second

OBJECTIVES:

L T P C
3 0 0 3

- To develop C Programs using basic programming constructs
- To develop C programs using arrays and strings
- To develop applications in C using functions, pointers and structures
- To do input/output and file handling in C

UNIT-I BASICS OF C PROGRAMMING

12

Introduction to programming paradigms-Structure of C program-C programming: Data Types- Storage classes- Constants-Enumeration Constants-Keywords-Operators Precedence and Associativity- Expressions- Input/output statements, Assignment statements- Decision making statements-Switch statement- Looping statements- Pre-processor directives- Compilation process

UNIT-II ARRAYS AND STRINGS

9+3

Introduction to Arrays: Declaration, Initialization - One dimensional array - Example Program: Computing Mean, Median and Mode - Two dimensional arrays - Example Program: Matrix Operations (Addition, Scaling, Determinant and Transpose) - String operations: length, compare, concatenate, copy- Selection sort, linear and binary search

UNIT-III FUNCTIONS AND POINTERS

9+3

Introduction to functions: Function prototype, function definition, function call, Built-in functions (string functions, math functions) - Recursion - Example Program: Computation of Sine series, Scientific calculate or using built-in functions, Binary Search using recursive functions-Pointers-Pointer operators-Pointer arithmetic -Arrays and pointers - Array of pointers -Example Program: Sorting of names-Parameter passing: Pass by value, Pass by reference-Example Program: Swapping of two numbers and changing the value of a variable using pass by reference

UNIT-IV STRUCTURES

9+3

Structure-Nested structures-Pointer and Structures-Array of structures- Example Program using structures and pointers-Self-referential structures-Dynamic memory allocation-Singly linked list- typedef

UNIT-V FILE PROCESSING

9+3

Files-Types of file processing: Sequential access, Random access-Sequential access file- Example Program: Finding average of numbers stored in sequential access file-Random access file- Example Program: Transaction processing using random access files - Command line arguments

TOTAL: 60 PERIODS

OUTCOMES:

Learners should be able to:

- Develop simple applications in C using basic constructs
- Design and implement applications using arrays and strings
- Develop and implement applications in C using functions and pointers.
- Develop applications in C using structures.
- Design applications using sequential and random access file processing.

TEXTBOOKS:

1. Reema Thareja, —Programming in C, Oxford University Press, Second Edition, 2016.
2. Kernighan, B.W and Ritchie, D.M, —The C Programming language, Second Edition,

OBJECTIVES:

- To know the generic models to structure the software development process.
- To understand different notion of complexity at both the module and system level.
- To be aware of some widely known design methods.
- To understand the role and contents of testing activities in different life cycle phases.

UNIT -I SOFTWARE PROCESS 9

Introduction –S/W Engineering Paradigm – life cycle models (water fall, incremental, spiral, WINWIN spiral, evolutionary, prototyping, object oriented) - system engineering – computer based system – verification – validation – life cycle process – development process –system engineering hierarchy.

UNIT -II SOFTWARE REQUIREMENT

Functional and non-functional - user – system –requirement engineering process – feasibility studies – requirements – elicitation – validation and management – software prototyping – prototyping in the software process – rapid prototyping techniques – user interface prototyping -S/W document. Analysis and modeling – data, functional and behavioral models – structured analysis and data dictionary.

UNIT- III DESIGN CONCEPTS AND PRINCIPLES 9

Design process and concepts – modular design – design heuristic – design model and document. Architectural design – software architecture – data design – architectural design – transform and transaction mapping – user interface design – user interface design principles. Real time systems – Real time software design – system design – real time executives – data acquisition system - monitoring and control system. SCM – Need for SCM – Version control – Introduction to SCM process – Software configuration items.

UNIT -IV TESTING 9

Taxonomy of software testing – levels – test activities – types of s/w test – black box testing – testing boundary conditions – structural testing – test coverage criteria based on data flow mechanisms – regression testing – testing in the large. S/W testing strategies – strategic approach and issues - unit testing – integration testing – validation testing – system testing and debugging.

UNIT –V SOFTWARE PROJECT MANAGEMENT 9

Measures and measurements – S/W complexity and science measure – size measure – data and logic structure measure – information flow measure. Software cost estimation – function point models – COCOMO model- Delphi method.- Defining a Task Network – Scheduling – Earned Value Analysis – Error Tracking - Software changes – program evolution dynamics – software maintenance – Architectural evolution. Taxonomy of CASE tools.

TOTAL : 45hrs

TEXT BOOK:

1. Roger S.Pressman, Software engineering- A practitioner's Approach, McGraw-Hill International Edition, 5th edition, 2001.

REFERENCES:

1. Ian Sommerville, Software engineering, Pearson education Asia, 6th edition, 2000.
2. PankajJalote- An Integrated Approach to Software Engineering, Springer Verlag, 1997.
3. James F Peters and WitoldPedrycz, "Software Engineering – An Engineering Approach", John Wiley and Sons, New Delhi, 2000.
4. Ali Behforooz and Frederick J Hudson, "Software Engineering Fundamentals", Oxford University Press, New Delhi, 1996.

OBJECTIVES:

- To understand different Internet Technologies.
- To learn java-specific web services architecture To design a context free grammar for any given language

UNIT-I WEBSITE BASICS, HTML 5, CSS 3, WEB 2.0 9

Web Essentials: Clients, Servers and Communication – The Internet – Basic Internet protocols – World wide web – HTTP Request Message – HTTP Response Message – Web Clients – Web Servers – HTML5 – Tables – Lists – Image – HTML5 control elements – Semantic elements – Drag and Drop – Audio – Video controls - CSS3 – Inline, embedded and external style sheets – Rule cascading – Inheritance – Backgrounds – Border Images – Colors – Shadows – Text – Transformations – Transitions – Animations.

UNIT -II CLIENT SIDE PROGRAMMING 9

java Script: An introduction to JavaScript–JavaScript DOM Model-Date and Objects,- Regular Expressions- Exception Handling-Validation-Built-in objects-Event Handling- DHTML with JavaScript- JSON introduction – Syntax – Function Files – Http Request – SQL.

UNIT -III SERVER SIDE PROGRAMMING 9


Servlets: Java Servlet Architecture- Servlet Life Cycle- Form GET and POST actions- Session Handling- Understanding Cookies- Installing and Configuring Apache Tomcat Web Server- DATABASE CONNECTIVITY: JDBC perspectives, JDBC program example - JSP: Understanding Java Server Pages-JSP Standard Tag Library (JSTL)-Creating HTML forms by embedding JSP code.


UNIT- IV PHP and XML 9

An introduction to PHP: PHP- Using PHP- Variables- Program control- Built-in functions- Form Validation- Regular Expressions - File handling – Cookies - Connecting to Database. XML: Basic XML- Document Type Definition- XML Schema DOM and Presenting XML, XML Parsers and Validation, XSL and XSLT Transformation, News Feed (RSS and ATOM).

UNIT -V INTRODUCTION TO AJAX and WEB SERVICES 9

AJAX: Ajax Client Server Architecture-XML Http Request Object-Call Back Methods; Web Services: Introduction- Java web services Basics – Creating, Publishing, Testing and Describing a Web services (WSDL)-Consuming a web service, Database Driven web service from an application –SOAP.


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TOTAL : 45 PERIODS

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OUTCOMES:

At the end of the course, the student should be able to:

- Construct a basic website using HTML and Cascading Style Sheets.
 - Build dynamic web page with validation using Java Script objects and by applying different event handling mechanisms.
 - Develop server side programs using Servlets and JSP.
 - Construct simple web pages in PHP and to represent data in XML format.
 - Use AJAX and web services to develop interactive web applications
- Derive whether a problem is decidable or not.

TEXTBOOKS:

1.J Deitel and Deitel and Nieto, —Internet and World Wide Web - How to ProgramI, Prentice Hall, 5th Edition, 2011.

REFERENCES:

1. Stephen Wynkoop and John Burke —Running a Perfect WebsiteI, QUE, 2nd Edition,1999.
2. Chris Bates, Web Programming – Building Intranet Applications, 3rd Edition, Wiley Publications, 2009.
3. Jeffrey C and Jackson, — Web Technologies A Computer Science Perspectivel Pearson Education, 2011.
4. Gopalan N.P. and AkilandeswariJ., Web TechnologyI, Prentice Hall of India, 2011.
5. UttamK.Roy, — Web TechnologiesI, Oxford University Press, 2011.


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22150S61P- CRYPTOGRAPHY AND NETWORK SECURITY

OBJECTIVES:

- To understand Cryptography Theories, Algorithms and Systems.
- To understand necessary Approaches and Techniques to build protection mechanisms in order to secure computer networks..

UNIT-I INTRODUCTION

9

Security trends - Legal, Ethical and Professional Aspects of Security, Need for Security at Multiple levels, Security Policies - Model of network security – Security attacks, services and mechanisms – OSI security architecture – Classical encryption techniques: substitution techniques, transposition techniques, steganography- Foundations of modern cryptography: perfect security – information theory – product cryptosystem – cryptanalysis.

UNIT-II SYMMETRIC KEY CRYPTOGRAPHY

MATHEMATICS OF SYMMETRIC KEY CRYPTOGRAPHY: Algebraic structures - Modular arithmetic-Euclid's algorithm- Congruence and matrices - Groups, Rings, Fields- Finite fields- SYMMETRIC KEY CIPHERS: SDES – Block cipher Principles of DES – Strength of DES – Differential and linear cryptanalysis - Block cipher design principles – Block cipher mode of operation – Evaluation criteria for AES – Advanced Encryption Standard - RC4 – Key distribution.

UNIT-III PUBLIC KEY CRYPTOGRAPHY

9

MATHEMATICS OF ASYMMETRIC KEY CRYPTOGRAPHY: Primes – Primality Testing – Factorization – Euler's totient function, Fermat's and Euler's Theorem - Chinese Remainder Theorem – Exponentiation and logarithm - ASYMMETRIC KEY CIPHERS: RSA cryptosystem – Key distribution – Key management – Diffie Hellman key exchange - ElGamal cryptosystem – Elliptic curve arithmetic-Elliptic curve cryptography.

UNIT-IV MESSAGE AUTHENTICATION AND INTEGRITY

9

Authentication requirement – Authentication function – MAC – Hash function – Security of hash function and MAC – SHA – Digital signature and authentication protocols – DSS- Entity Authentication: Biometrics, Passwords, Challenge Response protocols- Authentication applications - Kerberos, X.509 Elliptic curve arithmetic-Elliptic curve cryptography.

UNIT-V SECURITY PRACTICE AND SYSTEM SECURITY

Electronic Mail security – PGP, S/MIME – IP security – Web Security - SYSTEM SECURITY: Intruders – Malicious software – viruses – Firewalls.

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TOTAL: 45 PERIODS

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OUTCOMES:

At the end of the course, the student should be able to:

- Construct a basic website using HTML and Cascading Style Sheets.
- Build dynamic web page with validation using Java Script objects and

REFERENCES:

1. Stephen Wrynkoop and John Burke —Running a Perfect Website Edition,1999.

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22150E4CP- PROFESSIONAL ETHICS IN ENGINEERING

OBJECTIVES:

- To enable the students to create an awareness on Engineering Ethics and Human Values, to instill Moral and Social Values and Loyalty and to appreciate the rights of others.

UNIT I HUMAN VALUES

10

Morals, values and Ethics – Integrity – Work ethic – Service learning – Civic virtue – Respect for others – Living peacefully – Caring – Sharing – Honesty – Courage – Valuing time – Cooperation – Commitment – Empathy – Self confidence – Character – Spirituality – Introduction to Yoga and meditation for professional excellence and stress management.

UNIT II ENGINEERING ETHICS

9

Senses of 'Engineering Ethics' – Variety of moral issues – Types of inquiry – Moral dilemmas – Moral Autonomy – Kohlberg's theory – Gilligan's theory – Consensus and Controversy – Models of professional roles – Theories about right action – Self-interest – Customs and Religion – Uses of Ethical Theories.

UNIT III ENGINEERING AS SOCIAL EXPERIMENTATION

9

Engineering as Experimentation – Engineers as responsible Experimenters – Codes of Ethics – A Balanced Outlook on Law.

9

UNIT IV SAFETY, RESPONSIBILITIES AND RIGHTS

Safety and Risk – Assessment of Safety and Risk – Risk Benefit Analysis and Reducing Risk – Respect for Authority – Collective Bargaining – Confidentiality – Conflicts of Interest – Occupational Crime – Professional Rights – Employee Rights – Intellectual Property Rights (IPR) – Discrimination.

8

UNIT V GLOBAL ISSUES

Multinational Corporations – Environmental Ethics – Computer Ethics – Weapons

Development – Engineers as Managers – Consulting Engineers – Engineers as Expert Witnesses and Advisors – Moral Leadership – Code of Conduct – Corporate Social Responsibility.

TOTAL : 45 PERIODS

OUTCOMES:

At the end of the course, the student should be able to:

To apply ethics in society, discuss the ethical issues related to engineering and realize the responsibilities and rights in the society.

TEXTBOOKS:

1. Mike W. Martin and Roland Schinzinger, —Ethics in Engineering, Tata McGraw Hill, New Delhi, 2003.
2. Govindarajan M, Natarajan S, Senthil Kumar V, S, —Engineering Ethics, Prentice Hall of India, New Delhi, 2004.

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REFERENCES:

1. Charles B. Fleddermann, —Engineering Ethics, Pearson Prentice Hall, New Jersey, 2004.
2. Charles E. Harris, Michael S. Pritchard and Michael J. Rabins, —Engineering Ethics –Concepts and Cases, Cengage Learning, 2009.
3. John R. Boatright, —Ethics and the Conduct of Business, Pearson Education, New Delhi, 2003
4. Edmund G Seebauer and Robert L Barry, —Fundamentals of Ethics for Scientists and Engineers, Oxford University Press, Oxford, 2001.
5. Laura P. Hartman and Joe Desjardins, —Business Ethics: Decision Making for Personal Integrity and Social Responsibility, McGraw Hill education, India Pvt. Ltd., New Delhi, 2013.
6. World Community Service Centre, _ Value Education', Vethathiri publications, Erode, 2011.



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The student should be made to:

- Understand how Grid computing helps in solving large scale scientific problems.
- Gain knowledge on the concept of virtualization that is fundamental to cloud computing.
- Learn how to program the grid and the cloud.

Understand the security issues in the grid and the cloud environment

UNIT I INTRODUCTION

9

Evolution of Distributed computing: Scalable computing over the Internet – Technologies for network based systems – clusters of cooperative computers - Grid computing Infrastructures – cloud computing - service oriented architecture – Introduction to Grid Architecture and standards – Elements of Grid – Overview of Grid Architecture.

UNIT II GRID SERVICES

9

Introduction to Open Grid Services Architecture (OGSA) – Motivation – Functionality Requirements – Practical & Detailed view of OGSA/OGSI – Data intensive grid service models – OGSA services.

UNIT III VIRTUALIZATION

9

Cloud deployment models: public, private, hybrid, community – Categories of cloud computing: Everything as a service: Infrastructure, platform, software - Pros and Cons of cloud computing – Implementation levels of virtualization – virtualization structure – virtualization of CPU, Memory and I/O devices – virtual clusters and Resource Management – Virtualization for data center automation.

UNIT IV PROGRAMMING MODEL

9

Open source grid middleware packages – Globus Toolkit (GT4) Architecture, Configuration – Usage of Globus – Main components and Programming model - Introduction to Hadoop Framework – Mapreduce, Input splitting, map and reduce functions, specifying input and output parameters, configuring and running a job – Design of Hadoop file system, HDFS concepts, command line and java interface, dataflow of File read & File write.

UNIT V SECURITY

9

Trust models for Grid security environment – Authentication and Authorization methods – Grid security infrastructure – Cloud Infrastructure security: network, host and application level – aspects of data security, provider data and its security, Identity and access management architecture, IAM practices in the cloud, SaaS, PaaS, IaaS availability in the cloud, Key privacy issues in the cloud.

OUTCOME

At the end of the course, the student should be able to:

- Apply techniques to solve large scale scientific problems.
- Apply the concept of virtualization.
- Use the grid and cloud tool kits.
- Apply the security models in the grid and the cloud environment.

TEXT BOOK:

1. Kai Hwang, Geoffery C. Fox and Jack J. Dongarra, "Distributed and Cloud Computing: Clusters, Grids, Clouds and the Future of Internet", First Edition, Morgan Kaufman Publisher, an Imprint of Elsevier, 2012.

REFERENCES:

1. Jason Venner, "Pro Hadoop- Build Scalable, Distributed Applications in the Cloud", A Press, 2009
2. Tom White, "Hadoop The Definitive Guide", First Edition.

O'Reilly, 2009.

3. Bart Jacob (Editor), "Introduction to Grid Computing", IBM Red Books, Vervante, 2005

4. Ian Foster, Carl Kesselman, "The Grid: Blueprint for a New Computing Infrastructure", 2nd Edition, Morgan Kaufmann.

5. Frederic Magoules and Jie Pan, "Introduction to Grid Computing" CRC Press, 2009.

6. Daniel Minoli, "A Networking Approach to Grid Computing", John Wiley Publication, 2005.

7. Barry Wilkinson, "Grid Computing: Techniques and Applications", Chapman and Hall, CRC, Taylor and Francis Group, 2010.

22150E44BP- DATA WAREHOUSING AND DATA MINING LTPC 3104

OBJECTIVES:

- To understand data warehouse concepts, architecture, business analysis and tools
- To understand data pre-processing and data visualization techniques
- To study algorithms for finding hidden and interesting patterns in data
- To understand and apply various classification and clustering techniques using tools.

UNIT I DATA WAREHOUSING, BUSINESS ANALYSIS AND ON-LINE ANALYTICAL PROCESSING(OLAP)

Basic Concepts - Data Warehousing Components – Building a Data Warehouse – Database Architectures for Parallel Processing – Parallel DBMS Vendors - Multidimensional Data Model – Data Warehouse Schemas for Decision Support, Concept Hierarchies -

Characteristics of OLAP Systems – Typical OLAP Operations, OLAP and OLTP.

UNIT II DATA MINING – INTRODUCTION

Introduction to Data Mining Systems – Knowledge Discovery Process – Data Mining Techniques– Issues – applications- Data Objects and attribute types, Statistical description of data, Data Preprocessing – Cleaning, Integration, Reduction, Transformation and discretization, Data Visualization, Data similarity and dissimilarity measures.

UNIT III DATA MINING - FREQUENT PATTERN ANALYSIS

Mining Frequent Patterns, Associations and Correlations – Mining Methods- Pattern Evaluation Method – Pattern Mining in Multilevel, Multi Dimensional Space – Constraint

Based Frequent Pattern Mining, Classification using Frequent Patterns

UNIT IV CLASSIFICATION AND CLUSTERING

Decision Tree Induction - Bayesian Classification – Rule Based Classification – Classification by Back Propagation – Support Vector Machines – Lazy Learners – Model Evaluation and Selection- Techniques to improve Classification Accuracy. Clustering Techniques – Cluster analysis-Partitioning Methods - Hierarchical Methods – Density Based Methods - Grid Based Methods – Evaluation of clustering – Clustering highdimensional data- Clustering with constraints, Outlier analysis-outlier detection methods.

UNIT V WEKA TOOL

Datasets – Introduction, Iris plants database, Breast cancer database, Auto imports database - Introduction to WEKA, The Explorer – Getting started, Exploring the explorer, Learning algorithms, Clustering algorithms, Association–rule learners.

TOTAL : 45 PERIODS

OUTCOMES:

At the end of the course, the student should be able to:

- Design a Data warehouse system and perform business analysis with OLAP tools.
- Apply suitable pre-processing and visualization techniques for data analysis
- Apply frequent pattern and association rule mining techniques for data analysis
- Apply appropriate classification and clustering techniques for data analysis

TEXTBOOK

1. Jiawei Han and Micheline Kamber, —Data Mining Concepts and TechniquesI, Third Edition, Elsevier, 2012.

REFERENCES:

1. Alex Berson and Stephen J. Smith, —Data Warehousing, Data Mining & OLAP I, Tata McGraw – Hill Edition, 35th Reprint 2016.
2. K.P. Soman, Shyam Diwakar and V. Ajay, —Insight into Data Mining Theory and Practice I, Eastern Economy Edition, Prentice Hall of India, 2006.
3. Ian H. Witten and Eibe Frank, —Data Mining: Practical Machine Learning Tools and Techniques I, Elsevier, Second Edition.

22150E54AP- AD HOC AND SENSOR NETWORKS

OBJECTIVES:

The student should be made to:

- Understand the design issues in ad hoc and sensor networks.
- Learn the different types of MAC protocols.
- Be familiar with different types of ad hoc routing protocols.
- Be expose to the TCP issues in ad hoc networks.
- Learn the architecture and protocols of wireless sensor networks.

UNIT I INTRODUCTION 9

Fundamentals of Wireless Communication Technology – The Electromagnetic Spectrum – Radio propagation Mechanisms – Characteristics of the Wireless Channel -mobile ad hoc networks (MANETs) and wireless sensor networks (WSNs) : concepts and architectures, Applications of Ad Hoc and Sensor networks. Design Challenges in Ad hoc and Sensor Networks.

UNIT II MAC PROTOCOLS FOR AD HOC WIRELESS NETWORKS 9

Issues in designing a MAC Protocol- Classification of MAC Protocols- Contention based protocols- Contention based protocols with Reservation Mechanisms- Contention based protocols with Scheduling Mechanisms – Multi channel MAC-IEEE 802.11

UNIT III ROUTING PROTOCOLS AND TRANSPORT LAYER IN AD HOC WIRELESS NETWORKS 9

Issues in designing a routing and Transport Layer protocol for Ad hoc networks- proactive routing, reactive routing (on-demand), hybrid routing- Classification of Transport Layer solutions-TCP over Ad hoc wireless Networks.

UNIT IV WIRELESS SENSOR NETWORKS (WSNS) AND MAC PROTOCOLS 9

Single node architecture: hardware and software components of a sensor node - WSN Network architecture: typical network architectures-data relaying and aggregation strategies - MAC layer protocols: self-organizing, Hybrid TDMA/FDMA and CSMA based MAC- IEEE 802.15.4.

UNIT V WSN ROUTING, LOCALIZATION & QOS 9

Issues in WSN routing – OLSR- Localization – Indoor and Sensor Network Localization-absolute and relative localization, triangulation-QOS in WSN-Energy Efficient Design-Synchronization-Transport Layer issues.


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OBJECTIVES:

- To understand the basics of Information Retrieval.
- To understand machine learning techniques for text classification and clustering.
- To understand various search engine system operations.
- To learn different techniques of recommender system.

UNIT I INTRODUCTION

9

Information Retrieval – Early Developments – The IR Problem – The User's Task – Information versus Data Retrieval – The IR System – The Software Architecture of the IR System – The Retrieval and Ranking Processes – The Web – The e-Publishing Era – How the web changed Search – Practical Issues on the Web – How People Search – Search Interfaces Today – Visualization in Search Interfaces.

UNIT II MODELING AND RETRIEVAL EVALUATION

9

Basic IR Models - Boolean Model - TF-IDF (Term Frequency/Inverse Document Frequency) Weighting - Vector Model – Probabilistic Model – Latent Semantic Indexing Model – Neural Network Model – Retrieval Evaluation – Retrieval Metrics – Precision and Recall – Reference Collection – User-based Evaluation – Relevance Feedback and Query Expansion – Explicit Relevance Feedback.

UNIT III TEXT CLASSIFICATION AND CLUSTERING

9

A Characterization of Text Classification – Unsupervised Algorithms: Clustering – Naïve Text Classification – Supervised Algorithms – Decision Tree – k-NN Classifier – SVM Classifier – Feature Selection or Dimensionality Reduction – Evaluation metrics – Accuracy and Error – Organizing the classes – Indexing and Searching – Inverted Indexes – Sequential Searching – Multi-dimensional Indexing.

UNIT IV WEB RETRIEVAL AND WEB CRAWLING

9

The Web – Search Engine Architectures – Cluster based Architecture – Distributed Architectures – Search Engine Ranking – Link based Ranking – Simple Ranking Functions – Learning to Rank – Evaluations – Search Engine Ranking – Search Engine User Interaction – Browsing – Applications of a Web Crawler – Taxonomy – Architecture and Implementation – Scheduling Algorithms – Evaluation.

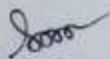
UNIT V RECOMMENDER SYSTEM

9

Recommender Systems Functions – Data and Knowledge Sources – Recommendation Techniques – Basics of Content-based Recommender Systems – High Level Architecture – Advantages and Drawbacks of Content-based Filtering – Collaborative Filtering – Matrix factorization models – Neighborhood models.

TOTAL : 45 PERIODS**OUTCOMES:**

At the end of the course, the student should be able to:



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- Use an open source search engine framework and explore its capabilities
- Apply appropriate method of classification or clustering.
- Design and implement innovative features in a search engine.
- Design and implement a recommender system.

TEXTBOOKS:

1. I.RicardoBaeza-Yates and BerthierRibeiro-Neto, —Modern Information Retrieval: The Concepts and Technology behind Search, Second Edition, ACM Press Books, 2011.
2. Ricci, F, Rokach, L, Shapira, B,Kantor, —Recommender Systems HandbookI, First Edition, 2011.

REFERENCES:

1. C. Manning, P. Raghavan, and H. Schütze, —Introduction to Information Retrieval, CambridgeUniversity Press, 2008.
2. Stefan Buettcher, Charles L. A. Clarke and Gordon V. Cormack, —Information Retrieval:Implementing and Evaluating Search Engines, The MIT Press, 2010.

22150E73DP-CYBER FORENSICS

LPTC
3003

OBJECTIVES:

- To learn computer forensics
- To become familiar with forensics tools
- To learn to analyze and validate forensics data.

UNIT I INTRODUCTION TO COMPUTER FORENSICS

9

Introduction to Traditional Computer Crime, Traditional problems associated with Computer Crime. Introduction to Identity Theft & Identity Fraud. Types of CF techniques - Incident and incident response methodology - Forensic duplication and investigation. Preparation for IR: Creating response tool kit and IR team. - Forensics Technology and Systems - Understanding Computer Investigation – Data Acquisition.

UNIT II EVIDENCE COLLECTION AND FORENSICS TOOLS

9

Processing Crime and Incident Scenes – Working with Windows and DOS Systems.Current Computer Forensics Tools: Software/ Hardware Tools.

UNIT III ANALYSIS AND VALIDATION

9

Validating Forensics Data – Data Hiding Techniques – Performing Remote Acquisition – Network Forensics – Email Investigations – Cell Phone and Mobile Devices Forensics

UNIT IV CRITICAL HACKING

9

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Introduction to Ethical Hacking – Foot printing and Reconnaissance - Scanning Networks - Enumeration - System Hacking - Malware Threats - Sniffing.

UNIT V ETHICAL HACKING IN WEB

9

Social Engineering - Denial of Service - Session Hijacking - Hacking Web servers – Hacking Web Applications – SQL Injection - Hacking Wireless Networks - Hacking Mobile Platforms.

TOTAL : 45 PERIODS

OUTCOMES:

At the end of the course, the student should be able to:


- Understand the basics of computer forensics
- Apply a number of different computer forensic tools to a given scenario
- Analyze and validate forensics data
- Identify the vulnerabilities in a given network infrastructure
- Implement real-world hacking techniques to test system security.

TEXTBOOKS:

1. Bill Nelson, Amelia Phillips, Frank Enfinger, Christopher Stuart, —Computer Forensics and InvestigationsI, Cengage Learning, India Edition, 2016.
2. CEH official Certified Ethical Hacking Review Guide, Wiley India Edition, 2015.

REFERENCES:

1. John R.Vacca, —Computer ForensicsI, Cengage Learning, 2005
2. MarjieT.Britz, —Computer Forensics and Cyber CrimeI: An IntroductionI, 3rd Edition, Prentice Hall, 2013.
3. AnkitFadia — Ethical HackingI Second Edition, Macmillan India Ltd, 2006
4. Kenneth C.Brancik —Insider Computer FraudI Auerbach Publications Taylor & Francis Group–2008.


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PROGRAM HANDBOOK

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SEMESTER - I


Semester. no	Subject Code	Subject Title	Periods per Week			C
			L	T	P	
I	22248S11AP	Higher Mathematics	4	1	0	4
I	22250H12P	Adhoc & Sensor Networks	4	0	0	4
I	22250H13P	Advanced Data Structures	4	0	0	4
Practical						
I	22250L14P	Advanced Web Technologies Lab	-	-	3	3
Total no of Credits						15

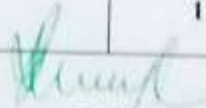
SEMESTER - II

Semester. no	Subject Code	Subject Title	Periods per Week			C
			L	T	P	
II	22250H21P	Middleware Technologies	3	1	0	4
II	22250H22P	Internet of Things	4	0	0	4
II	22250E23_P	Elective I	3	0	0	3
Practical						
II	22250L24P	.NET Technologies Lab	-	-	3	3
II	222TECWRP	Technical Writing /Seminars	-	-	3	3
Total no of Credits						17

SEMESTER - III

Semester.no	Subject Code	Subject Title	Periods per Week			C
			L	T	P	
III	22250H31P	Modern Operating System	4	0	0	4
III	22250E32P	Machine Learning Techniques	4	0	0	4
III	22250E33_P	Elective-II	3	0	0	3
Total no of Credits						11


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SEMESTER - IV


Semester no.	Subject Code	Subject Title	Periods per Week			C
			L	T	P	
IV	22250H41P	Object Oriented Software Engineering	4	0	0	4
IV	22250H42P	Software Project Management	4	0	0	4
IV	22250E43_P	Elective-V	3	0	0	3
IV	22250P44P	Project Work- Phase I	-	-	6	10
Total no of Credits						21

SEMESTER - V

Semester no.	Subject Code	Subject Title	Periods per Week			C
			L	T	P	
V	22250E51_P	Elective-IV	3	0	0	3
V	22250E52_P	Elective-V	3	0	0	3
V	22250E53_P	Elective-VI	3	0	0	3
Total no of Credits						9

SEMESTER - VI

Semester no.	Subject Code	Subject Title	Periods per Week			C
			L	T	P	
VI	22250P61P	Project Work- Phase II	0	0	15	15
Total no of Credits						15


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LIST OF ELECTIVES

SEMESTER - I ELECTIVE - I

Semester no	Subject Code	Subject Title	Periods per Week			C
			L	T	P	
II	22250E23AP	Advanced Distributed Computing	3	0	0	3
II	22250E23BP	Data Warehousing & Data Mining	3	0	0	3
II	22250E23CP	Information Retrieval Techniques	3	0	0	3

SEMESTER - II ELECTIVE - II

Semester no	Subject Code	Subject Title	Periods per Week			C
			L	T	P	
III	22250E33AP	Multimedia Systems	3	0	0	3
III	22250E33BP	Web Engineering	3	0	0	3
III	22250E33CP	Software Metrics	3	0	0	3

SEMESTER - III - ELECTIVE - III

Semester no	Subject Code	Subject Title	Periods per Week			C
			L	T	P	
II	22250E43AP	Service Oriented Architecture	3	0	0	3
II	22250E43BP	High Speed Networks	3	0	0	3
II	22250E43CP	Language Technologies	3	0	0	3


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SEMESTER - IV - ELECTIVE - IV


Semester no	Subject Code	Subject Title	Periods per Week			C
			L	T	P	
III	22250E51AP	Cloud Computing	3	0	0	3
III	22250E51BP	Speech Processing and Synthesis	3	0	0	3
III	22250E51CP	Soft Computing	3	0	0	3

SEMESTER - V - ELECTIVE - V

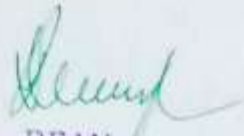
Semester no	Subject Code	Subject Title	Periods per Week			C
			L	T	P	
III	22250E52AP	Advanced Database Technology	3	0	0	3
III	22250E52BP	Reconfigurable Computing	3	0	0	3
III	22250E52CP	Green Computing	3	0	0	3

SEMESTER - VI - ELECTIVE - VI

Semester no	Subject Code	Subject Title	Periods per Week			C
			L	T	P	
III	22250E53AP	Software Quality Assurance	3	0	0	3
III	22250E53BP	Bio-inspired Computing	3	0	0	3
III	22250E53CP	Wireless Application Protocols	3	0	0	3



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CREDITS DISTRIBUTION

Semester	Theory Courses		Elective Courses		Practical Courses		Project	Total Credit
	Nos	Credit	Nos	Credit	Nos	Credit	Credit	
I	3	12	-	-	1	03	-	15
II	2	08	1	03	2	06	-	17
III	2	08	1	03	-	-	-	11
IV	2	08	1	03	1	-	10	21
V	-	-	3	9	-	-	-	9
VI	-	-	-	-	-	-	15	15
TOTAL	9	36	6	18	3	9	21	87
TOTAL CREDITS								88

TOTALCREDITS	
Semester - I	15
Semester - II	17
Semester - III	11
Semester - IV	21
Semester - V	9
Semester - VI	15
TOTAL	88


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22250H22P - INTERNET OF THINGS L T P C
4 0 0 4

OBJECTIVES:

- To understand the fundamentals of Internet of Things
 - To learn about the basics of IOT protocols
 - To build a small low cost embedded system using Raspberry Pi.
- To apply the concept of Internet of Things in the real world scenario.

UNIT-I INTRODUCTION TO IoT 9

Internet of Things - Physical Design- Logical Design- IoT Enabling Technologies - IoT Levels & Deployment Templates - Domain Specific IoTs - IoT and M2M - IoT System Management with NETCONF-YANG-IoT Platforms Design Methodology

UNIT-II IoT ARCHITECTURE 9

M2M high-level IETs architecture-IETF architecture for IoT-OGC architecture-IoT reference model-Domain model-information model-functional model-communication model-IoT reference architecture

UNIT-III IoT PROTOCOLS 9

Protocol Standardization for IoT - Efforts - M2M and WSN Protocols - SCADA and RFID Protocols - Unified Data Standards - Protocols - IEEE 802.15.4 - BACNet Protocol - Modbus - Zigbee Architecture - Network layer - 6LowPAN - CoAP - Security

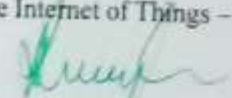
UNIT-IV BUILDING IoT WITH RASPBERRY PI & ARDUINO 9

Building IOT with RASPBERRY PI-IoT Systems - Logical Design using Python - IoT Physical Devices & Endpoints - IoT Device - Building blocks - Raspberry Pi - Board - Linux on Raspberry Pi - Raspberry Pi Interfaces - Programming Raspberry Pi with Python- Other IoT Platforms- Arduino.

REFERENCE

1. Arshdeep Bahga, Vijay Madiseti, — Internet of Things – A hands-on approach, Universities Press, 2015
2. Dieter Uckelmann, Mark Harrison, Michahelles, Florian (Eds), — Architecting the Internet of Things, Springer, 2011.
3. Honbo Zhou, — The Internet of Things in the Cloud: A Middleware Perspective, CRC Press, 2012.
4. Jan Ho" ller, Vlasios Tsiatsis, Catherine Mulligan, Stamatis, Karnouskos, Stefan Avesand, David Boyle, "From Machine-to-Machine to the Internet of Things- Introduction to a New Age of Intelligence", Elsevier, 2014.
5. Olivier Hersent, David Boswarthick, Omar Elloumi, — The Internet of Things – Key applications and protocols, Wiley, 2012

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AIM:

The main objective of this paper is to make the students to know the need of Machine Learning Techniques.

OBJECTIVES:

- To introduce students to the basic concepts and techniques of Machine Learning.
- To have a thorough understanding of the Supervised and Unsupervised learning techniques
- To study the various probability based learning techniques
- To understand graphical models of machine learning algorithms

UNIT-I INTRODUCTION

9

Learning – Types of Machine Learning – Supervised Learning – The Brain and the Neuron – Design a Learning System – Perspectives and Issues in Machine Learning – Concept Learning Task – Concept Learning as Search – Finding a Maximally Specific Hypothesis – Version Spaces and the Candidate Elimination Algorithm – Linear Discriminants – Perceptron – Linear Separability – Linear Regression.

UNIT-II LINEAR MODELS

9

Multi-layer Perceptron – Going Forwards – Going Backwards: Back Propagation Error – Multi-layer Perceptron in Practice – Examples of using the MLP – Overview – Deriving Back-Propagation – Radial Basis Functions and Splines – Concepts – RBF Network – Curse of Dimensionality – Interpolations and Basis Functions – Support Vector Machines.

UNIT-III TREE AND PROBABILISTIC MODELS

9

Learning with Trees – Decision Trees – Constructing Decision Trees – Classification and Regression Trees – Ensemble Learning – Boosting – Bagging – Different ways to Combine Classifiers – Probability and Learning – Data into Probabilities – Basic Statistics – Gaussian Mixture Models – Nearest Neighbor Methods – Unsupervised Learning – K means Algorithms – Vector Quantization – Self Organizing Feature Map

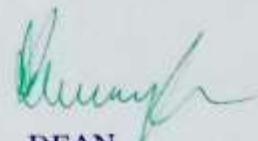
UNIT IV DIMENSIONALITY REDUCTION AND EVOLUTIONARY MODELS

9

Dimensionality Reduction – Linear Discriminant Analysis – Principal Component Analysis – Factor Analysis – Independent Component Analysis – Locally Linear Embedding – Isomap – Least Squares Optimization – Evolutionary Learning – Genetic algorithms – Genetic Offspring: – Genetic Operators – Using Genetic Algorithms – Reinforcement Learning – Overview – Getting Lost Example – Markov Decision Process



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UNITY GRAPHICAL MODELS

9

Markov Chain Monte Carlo Methods – Sampling – Proposal Distribution – Markov Chain Monte Carlo – Graphical Models – Bayesian Networks – Markov Random Fields – Hidden Markov Models – Tracking Methods

Total : 45 hrs

REFERENCES:

1. Elhemi Alpaydm, — Introduction to Machine Learning 3e (Adaptive Computation and Machine Learning Series), Third Edition, MIT Press, 2014
2. Jason Bell, — Machine Learning – Hands on for Developers and Technical Professionals I, First Edition, Wiley, 2014
3. Peter Flach, — Machine Learning: The Art and Science of Algorithms that Make Sense of Data, First Edition, Cambridge University Press, 2012.
4. Stephen Marsland, — Machine Learning – An Algorithmic Perspective I, Second Edition, Chapman and Hall/CRC Machine Learning and Pattern Recognition Series, 2014.
5. Tom M Mitchell, — Machine Learning I, First Edition, McGraw Hill Education, 2013.

22250E51P-SPEECH PROCESSING AND SYNTHESIS

LTPC

3003

OBJECTIVES

- To understand the mathematical foundations needed for speech processing
- To understand the basic concepts and algorithms of speech processing and synthesis
- To familiarize the students with the various speech signal representation, coding and recognition techniques
- To appreciate the use of speech processing in current technologies and to expose the students to real-world applications of speech processing


UNIT –I FUNDAMENTALS OF SPEECH PROCESSING

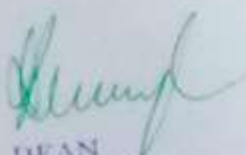
9

Introduction – Spoken Language Structure – Phonetics and Phonology – Syllables and Words – Syntax and Semantics – Probability, Statistics and Information Theory – Probability Theory – Estimation Theory – Significance Testing – Information Theory.

UNIT-II SPEECH SIGNAL REPRESENTATIONS AND CODING

9


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Overview of Digital Signal Processing – Speech Signal Representations – Short time Fourier Analysis
Acoustic Model of Speech Production – Linear Predictive Coding – Cepstral Processing
Formant Frequencies – The Role of Pitch – Speech Coding – LPC Coder.

UNIT III SPEECH RECOGNITION

Hidden Markov Models – Definition – Continuous and Discontinuous HMMs – Practical Issues
Limitations. Acoustic Modeling – Variability in the Speech Signal – Extracting Features – Phonetic
Modeling – Adaptive Techniques – Confidence Measures – Other Techniques.

UNIT-IV TEXT ANALYSIS

Lexicon – Document Structure Detection – Text Normalization – Linguistic Analysis
– Homograph Disambiguation – Morphological Analysis – Letter-to-sound Conversion –
Prosody – Generation Schematic – Speaking Style – Symbolic Prosody – Duration Assignment –
Pitch Generation

UNIT-V- SPEECH SYNTHESIS

Attributes – Formant Speech Synthesis – Concatenative Speech Synthesis – Prosodic
Modification of Speech –
our filter Models for Prosody Modification Evaluation of TTS Systems.

TOTAL: 45 PERIODS

REFERENCES:

1. Joseph Mariani, — Language and Speech Processing, Wiley, 2009.
2. Lawrence Rabiner and Biing-Hwang Juang, — Fundamentals of Speech Recognition, Prentice Hall Signal Processing Series, 1993.
3. Sadaoki Furui, — Digital Speech Processing: Synthesis, and Recognition, Second Edition, (Signal Processing and Communications), Marcel Dekker, 2000.
4. Thomas F. Quatieri, — Discrete-Time Speech Signal Processing, Pearson Education, 2002.
5. Xuedong Huang, Alex Acero, Hsiao-Wuen Hon, — Spoken Language Processing – A guide to Theory, Algorithm and System Development, Prentice Hall PTR, 2001.

22250E52BP - RECONFIGURABLE COMPUTING

LTPC
4004

OBJECTIVES:

- To understand the need for reconfigurable computing
- To expose the students to various device architectures
- To examine the various reconfigurable computing systems
- To understand the different types of computer models for programming reconfigurable architectures
- To expose the students to HDL programming and familiarize with the development

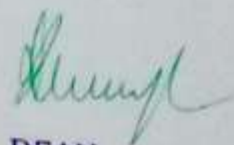
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- environment
- To expose the students to the various placement and routing protocols
- To develop applications with FPGAs

UNIT I DEVICE ARCHITECTURE

General Purpose Computing Vs Reconfigurable Computing –
Simple Programmable Logic Devices – Complex Programmable Logic Devices – FPGAs –
Device Architecture – Case Studies.

UNIT II RECONFIGURABLE COMPUTING ARCHITECTURES AND SYSTEMS

9

Reconfigurable Processing Fabric Architectures – RPF Integration into Traditional Computing Systems –
Reconfigurable Computing Systems – Case Studies – Reconfiguration Management.

UNIT III PROGRAMMING RECONFIGURABLE SYSTEMS

Compute Models – Programming FPGA Applications in HDL –
Compiling C for Spatial Computing

– Operating System Support for Reconfigurable Computing. UNIT IV MAPPING DESIGNS TO RECONF
The Design Flow – Technology Mapping – FPGA Placement and Routing –
Configuration Bitstream Generation – Case Studies with Appropriate Tools.

UNIT V APPLICATION DEVELOPMENT WITH FPGAS

9

Case Studies of FPGA Applications – System on a Programmable Chip (SoPC) Designs.

TOTAL: 45 PERIODS

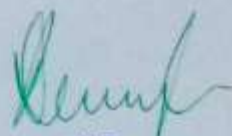
REFERENCES:

1. Christophe Bobda, — Introduction to Reconfigurable Computing – Architectures, Algorithms and Applications I, Springer, 2010.
2. Maya B. Gokhale and Paul S. Graham, — Reconfigurable Computing: Accelerating Computation with Field-Programmable Gate Arrays I, Springer, 2005.
3. FPGA Frontiers: New Applications in Reconfigurable Computing, 2017, Nicole Hemsoth, Timothy Prickett Morgan, Next Platform.
4. Reconfigurable Computing: From FPGAs to Hardware/Software Codesign 2011 Edition by Joao Cardoso (Editor), Michael Hübné, Springer
5. Scott Hauck and Andre Dehon (Eds.), — Reconfigurable Computing – The Theory and Practice of FPGA-



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OBJECTIVES:

- Build a solid foundation and acquire the vocabulary you need to supervise or to communicate with others who use these tools.
- To have ability to design drugs.
- To understand Evolutionary Trees and Phylogeny.
- Learn the key methods and tools used in bioinformatics.

UNIT I FUNDAMENTALS 7

The Central Dogma – Killer Application – Parallel Universes – Watson’s Definition – Top Down Vs Bottom Up Approach – Information Flow – Conversance – Communications.

UNIT II DATABASE AND NETWORKS 9

Definition – Data Management – Data Life Cycle – Database Technology – Interfaces – Implementation – Networks Communication Models – Transmission Technology – Protocols – Bandwidth – Topology – Contents – Security – Ownership – Implementation.

UNIT III SEARCH ENGINES AND DATA VISUALIZATION 10

Search Process – Technologies – Searching and Information Theory – Computational Methods – Knowledge Management – Sequence Visualizations – Structure Visualizations – User Interfaces – Animation Vs Simulation.

UNIT IV STATISTICS- DATA MINING AND PATTERN MATCHING 11

Statistical Concepts – Micro Arrays – Imperfect Data – Basics – Quantifying – Randomness – Data Analysis – Tools Selection – Alignment – Clustering – Classification – Data Mining Methods – Technology – Infrastructure Pattern Recognition – Discovery – Machine Learning – Text Mining – Pattern Matching Fundamentals – Dot Matrix Analysis – Substitution Matrix – Dynamic Programming – Word Method – Bayesian Method – Multiple Sequence Alignment Tools.

UNIT V MODELING SIMULATION AND COLLABORATION 8

Drug Discovery Fundamentals – Protein Structure – System Biology Tools – Collaboration and Communication – Standards – Issues – Case Study.

Total: 45hrs**TEXT BOOK:**

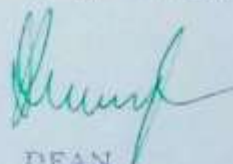
1. Bryan Bergeron, “Bio Informatics Computing”, Prentice Hall, 2003.

REFERENCES:

1. T.K. Affward, D.J. Parry Smith, “Introduction to Bio Informatics”, Pearson Education, 2001.
2. Pierre Baldi, Soren Brunak, “Bio Informatics The Machine Learning Approach”, 2nd Edition, First East West Press, 2003.



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OBJECTIVES:

- Understand the characteristics of web applications
- Learn to Model web applications
- Be aware of Systematic design methods
- Be familiar with the testing techniques for web applications

UNIT I INTRODUCTION TO WEB ENGINEERING

Motivation, Categories of Web Applications, Characteristics of Web Applications, Requirements of Engineering in Web Applications
Web Engineering-Components of Web Engineering Web Engineering Process-Communication-Planning.

UNIT II WEB APPLICATION ARCHITECTURES & MODELLING WEB APPLICATIONS

9

Introduction-Categorizing Architectures Specifics of Web Application Architectures, Components of a Generic Web Application
Architecture- Layered Architectures, 2-Layer Architectures, N-Layer Architectures-Data aspect Architectures, Database
centric Architectures- Architectures for Web Document Management- Architectures for Multimedia Data-Modeling Specifics
Web Engineering, Levels, Aspects, Phases Customization, Modeling Requirements, Hypertext Modeling, Hypertext
structure Modeling Concepts, Access Modeling Concepts, Relation to Content Modeling, Presentation Modeling, Relation
Hypertext Modeling, Customization Modeling, Modelling Framework-Modeling languages-Analysis Modeling for Web Apps-The
Content Model-The Interaction Model-Configuration Model.

UNIT III WEB APPLICATION DESIGN

9

Design for Web Apps- Goals-Design Process-Interactive Design- Principles and Guidelines Workflow-Preliminaries-Design Step
Usability-Issues-Information Design Information Architecture- structuring- Accessing Information-Navigation Design- Functions
Design-WebApp Functionality-Design Process-Functional Architecture- Detailed Functional Design

UNIT IV TESTING WEB APPLICATIONS

9

Introduction-Fundamentals-Test Specifics in Web Engineering-Test Approaches Conventional Approaches, Agile Approaches-
Testing concepts-Testing Process-Test Scheme Test Methods and Techniques- Link Testing- Browser Testing-Usability Testing
Load, Stress, and Continuous Testing, Testing Security, Test-driven Development, - Content Testing-User Interface testing
Usability Testing-Compatibility Testing Component Level Testing-Navigation Testing-Configuration testing-Security an
Performance Testing- Test Automation.

UNIT V PROMOTING WEB APPLICATIONS AND WEB PROJECT MANAGEMENT

9

Introduction-challenges in launching the web Application-Promoting Web Application Content Management-Usage Analysis-
Web Project Management-Challenges in Web Project Management-Managing Web Team- Managing the Development Process of
Web Application- Risk, Developing a Schedule, Managing Quality, Managing Change, Tracking the Project. Introduction to nodeJS
websockets.

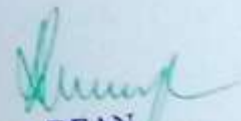
TOTAL: 45 PERIODS

REFERENCES:

1. Chris Bates, — Web Programming: Building Internet Applications I, Third Edition, Wiley India Edition, 2007.



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OBJECTIVES:

- To learn the fundamentals of natural language processing
- To appreciate the use of CFG and PCFG in NLP
- To understand the role of semantics and pragmatics

UNIT I INTRODUCTION

9

Words-Regular Expressions and Automata- Words and Transducers-N-grams-Part-of-Speech-Tagging-
Hidden Markov and Maximum Entropy Models.

UNIT II SPEECH

9

Speech-Phonetics-Speech Synthesis-Automatic Speech Recognition-Speech Recognition:- Advanced Topics-Computational Phonology

UNIT III SYNTAX

9

Formal Grammar of English-Syntactic Parsing-Statistical Parsing-Features and Unification - Language and Complexity.

UNIT IV SEMANTICS AND PRAGMATICS

9

The Representation of Meaning-Computational Semantics-Lexical Semantics Computational Lexical Semantics -Computational Discourse

UNIT V APPLICATIONS

9

Information Extraction-Question Answering and Summarization Dialogue and Conversational Agents-Machine Translation.

TOTAL:45 PERIODS

OUTCOMES:

Upon completion of this course, the students should be able to:

- To tag a given text with basic Language features
- To design an innovative application using NLP components
- To implement a rule based system to tackle morphology/syntax of a language
- To design a tag set to be used for statistical processing for real-time applications
- To compare and contrast use of different statistical approaches for different types of NLP applications.

REFERENCES:

1. Breck Baldwin, "Language Processing with Java and LingPipe Cookbook", Atlantic Publisher, 2010.
2. Daniel Jurafsky, "Speech and Language Processing: An Introduction to Natural Language Processing, Computational Linguistics Speech", Pearson Publication, 2014.
3. Nitin Indurkha and Fred J. Damerau, "Handbook of Natural Language Processing", Second Edition, Chapman and Hall/CRC Press, 2010.
4. Richard M Reese, "Natural Language Processing with Java", O_Reilly Media, 2015.
5. Steven Bird, Ewan Klein and Edward Loper, "Natural Language Processing with Python", First Edition, O_Reilly Media, 2009.

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OBJECTIVES:

- To understand the basics of Information Retrieval.
- To understand machine learning techniques for text classification and clustering.
- To understand various search engine system operations.
- To learn different techniques of recommender system.

UNIT I INTRODUCTION

9

Information Retrieval – Early Developments – The IR Problem – The User's Task – Information versus Data Retrieval - The IR System – The Software Architecture of the IR System – The Retrieval and Ranking Processes - The Web – The e-Publishing Era – How the web changed Search – Practical Issues on the Web – How People Search – Search Interfaces Today – Visualization in Search Interfaces.

UNIT II MODELING AND RETRIEVAL EVALUATION

9

Basic IR Models - Boolean Model - TF-IDF (Term Frequency/Inverse Document Frequency) Weighting - Vector Model – Probabilistic Model – Latent Semantic Indexing Model – Neural Network Model – Retrieval Evaluation – Retrieval Metrics – Precision and Recall – Reference Collection – User-based Evaluation – Relevance Feedback and Query Expansion – Explicit Relevance Feedback.

UNIT III TEXT CLASSIFICATION AND CLUSTERING

9

A Characterization of Text Classification – Unsupervised Algorithms: Clustering – Naïve Text Classification – Supervised Algorithms – Decision Tree – k-NN Classifier – SVM Classifier – Feature Selection or Dimensionality Reduction – Evaluation metrics – Accuracy and Error – Organizing the classes – Indexing and Searching – Inverted Indexes – Sequential Searching – Multi-dimensional Indexing.

UNIT IV WEB RETRIEVAL AND WEB CRAWLING

9

The Web – Search Engine Architectures – Cluster based Architecture – Distributed Architectures– Search Engine Ranking – Link based Ranking – Simple Ranking Functions – Learning to Rank – Evaluations – Search Engine Ranking – Search Engine User Interaction – Browsing – Applications of a Web Crawler – Taxonomy – Architecture and Implementation – Scheduling Algorithms – Evaluation.

UNIT V RECOMMENDER SYSTEM

9

Recommender Systems Functions – Data and Knowledge Sources – Recommendation Techniques – Basics of Content-based Recommender Systems – High Level Architecture – Advantages and Drawbacks of Content-based Filtering – Collaborative Filtering – Matrix factorization models – Neighborhood models..

TOTAL : 45 PERIODS**OUTCOMES:**

At the end of the course, the student should be able to:

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- Use an open source search engine framework and explore its capabilities
- Apply appropriate method of classification or clustering.
- Design and implement innovative features in a search engine.
- Design and implement a recommender system.

TEXTBOOKS:

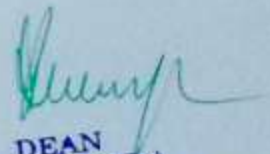
3. 1. Ricardo Baeza-Yates and Berthier Ribeiro-Neto, —Modern Information Retrieval: The Concepts and Technology behind Search, Second Edition, ACM Press Books, 2011.
4. Ricci, F, Rokach, L. Shapira, B. Kantor, —Recommender Systems Handbook, First Edition, 2011.

REFERENCES:

3. C. Manning, P. Raghavan, and H. Schütze, —Introduction to Information Retrieval, Cambridge University Press, 2008.
4. Stefan Buettcher, Charles L. A. Clarke and Gordon V. Cormack, —Information Retrieval: Implementing and Evaluating Search Engines, The MIT Press, 2010.



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PROGRAM HANDBOOK

M.Tech
COMPUTER SCIENCE AND ENGINEERING
[FULL TIME]

[REGULATION 2022]

[For candidates admitted to M.Tech CSE program from June 2022 onwards]

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SEMESTER – I

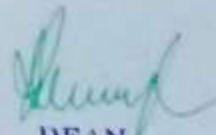
Semester. no	Subject Code	Subject Title	Periods per Week			C
			L	T	P	
1	22248S11A	Higher Mathematics	4	1	0	4
1	22250H12	Modern Operating System	4	0	0	4
1	22250H13	Machine Learning Techniques	4	0	0	4
1	22250H14	Adhoc and Sensor Network	4	0	0	4
1	22250H15	Advanced Data Structures and Algorithms	4	1	0	4
1	22250E16	Elective - I	3	0	0	3
Practical						
1	22250L17	Advanced Web Technologies Lab	-	-	3	3
Total no of Credit						26

SEMESTER – II

Semester. no	Subject Code	Subject Title	Periods per Week			C
			L	T	P	
II	22250H21	Middleware Technologies	3	1	0	4
II	22250H22	Object Oriented Software Engineering	4	0	0	4
II	22250H23	Internet of Things	4	0	0	4
II	22250E24	Elective II	3	0	0	3
II	22250E25	Elective – III	3	0	0	3
Practical						
II	22250L26	.NET Technologies Lab	-	-	3	3
II	222TECWR	Technical Writing /Seminars	-	-	3	3
Total no of Credit						24



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SEMESTER – III

Semester.no	Subject Code	Subject Title	Periods per Week			C
			L	T	P	
III	22250H31	Software Project Management	4	0	0	4
III	22250E32_	Elective-IV	3	0	0	3
III	22250E33_	Elective-V	3	0	0	3
III	22250E34_	Elective-VI	3	0	0	3
III	22250P35	Project Work- Phase I*	-	-	10	10
Total no of Credit						23

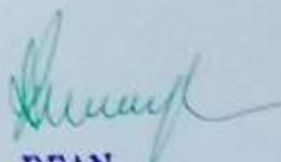
SEMESTER – IV

Semester no.	Subject Code	Subject Title	Periods per Week			C
			L	T	P	
IV	22250P41	Project Work- Phase II*	-	-	15	15
Total no of Credit						15

* - Only review will be conducted



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List of Electives
Semester – I - Elective – I

Semester no	Subject Code	Subject Title	Periods per Week			C
			L	T	P	
I	22250E16A	Multimedia Systems	3	0	0	3
I	22250E16B	Web Engineering	3	0	0	3
I	22250E16C	Software Metrics	3	0	0	3

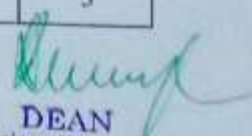
SEMESTER – II - Elective – II

Semester no	Subject Code	Subject Title	Periods per Week			C
			L	T	P	
II	22250E24A	Advanced Distributed Computing	3	0	0	3
II	22250E24B	Data Warehousing & Data Mining	3	0	0	3
II	22250E24C	Information Retrieval Techniques	3	0	0	3

SEMESTER – II - Elective – III

Semester no	Subject Code	Subject Title	Periods per Week			C
			L	T	P	
II	22250E25A	Service Oriented Architecture	3	0	0	3
II	22250E25B	High Speed Networks	3	0	0	3
II	22250E25C	Language Technologies	3	0	0	3


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SEMESTER – III - Elective – IV

Semester no	Subject Code	Subject Title	Periods per Week			C
			L	T	P	
III	22250E32A	Cloud Computing	3	0	0	3
III	22250E32B	Speech Processing and Synthesis	3	0	0	3
III	22250E32C	Soft Computing	3	0	0	3

SEMESTER – III - Elective – V

Semester no	Subject Code	Subject Title	Periods per Week			C
			L	T	P	
III	22250E33A	Advanced Database Technology	3	0	0	3
III	22250E33B	Reconfigurable Computing	3	0	0	3
III	22250E33C	Green Computing	3	0	0	3

SEMESTER – III - Elective – VI

Semester no	Subject Code	Subject Title	Periods per Week			C
			L	T	P	
III	22250E34A	Software Quality Assurance	3	0	0	3
III	22250E34B	Bio-inspired Computing	3	0	0	3
III	22250E34C	Wireless Application Protocols	3	0	0	3

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Semester	Theory Courses		Elective Courses		Practical Courses		Total Credits
	Nos.	Credits	Nos.	Credits	Nos.	Credits	
I	05	20	01	03	01	03	26
II	03	12	02	06	02	06	24
III	01	04	03	9	01	10	23
IV	-	-	-	-	01	15	15
TOTAL							88

TOTAL CREDITS	
Semester - I	26
Semester - II	24
Semester - III	23
Semester - IV	15
TOTAL	88


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22250H23 - INTERNET OF THINGS **L T P C**
4 0 0 4

OBJECTIVES:

- To understand the fundamentals of Internet of Things
 - To learn about the basics of IOT protocols
 - To build a small low cost embedded system using Raspberry Pi.
- To apply the concept of Internet of Things in the real world scenario.

UNIT-I INTRODUCTION TO IoT 9

Internet of Things - Physical Design- Logical Design- IoT Enabling Technologies - IoT Levels & Deployment Templates - Domain Specific IoTs - IoT and M2M - IoT System Management with NETCONF-YANG-IoT Platforms Design Methodology

UNIT-II IoT ARCHITECTURE 9

M2M high-level IETSI architecture-IETF architecture for IoT-OGC architecture-IoT reference model-Domain model-information model-functional model-communication model-IoT reference architecture

UNIT-III IoT PROTOCOLS 9

Protocol Standardization for IoT – Efforts – M2M and WSN Protocols – SCADA and RFID Protocols – Unified Data Standards – Protocols – IEEE 802.15.4 – BACNet Protocol – Modbus – Zigbee Architecture – Network layer – 6LowPAN – CoAP – Security

UNIT-IV BUILDING IoT WITH RASPBERRY PI & ARDUINO 9

Building IOT with RASPBERRY PI-IoT Systems - Logical Design using Python - IoT Physical Devices & Endpoints - IoT Device - Building blocks - Raspberry Pi - Board - Linux on Raspberry Pi - Raspberry Pi Interfaces - Programming Raspberry Pi with Python- Other IoT Platforms- Arduino.

REFERENCE

1. Arshdeep Bahga, Vijay Madiseti, — Internet of Things – A hands-on approach, Universities Press, 2015
2. Dieter Uckelmann, Mark Harrison, Michahelles, Florian (Eds), — Architecting the Internet of Things, Springer, 2011.
3. Honbo Zhou, — The Internet of Things in the Cloud: A Middleware Perspective, CRC Press, 2012.
4. Jan Ho"ller, Vlasios Tsiatsis, Catherine Mulligan, Stamatis, Karnouskos, Stefan Avesand, David Boyle, "From Machine-to-Machine to the Internet of Things- Introduction to a New Age of Intelligence", Elsevier, 2014.
5. Olivier Hersent, David Boswarthick, Omar Elloumi, — The Internet of Things – Key Applications and Protocols, Wiley, 2012

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AIM:

The main objective of this paper is to make the students to know the need of Machine Learning Techniques.

OBJECTIVES:

- To introduce students to the basic concepts and techniques of Machine Learning.
- To have a thorough understanding of the Supervised and Unsupervised learning techniques
- To study the various probability based learning techniques
- To understand graphical models of machine learning algorithms

UNIT-I INTRODUCTION

9

Learning – Types of Machine Learning – Supervised Learning – The Brain and the Neuron – Design a Learning System – Perspectives and Issues in Machine Learning – Concept Learning Task – Concept Learning as Search – Finding a Maximally Specific Hypothesis – Version Spaces and the Candidate Elimination Algorithm – Linear Discriminants – Perceptron – Linear Separability – Linear Regression.

UNIT-II LINEAR MODELS

9

Multi-layer Perceptron – Going Forwards – Going Backwards: Back Propagation Error – Multi-layer Perceptron in Practice – Examples of using the MLP – Overview – Deriving Back-Propagation – Radial Basis Functions and Splines – Concepts – RBF Network – Curse of Dimensionality – Interpolations and Basis Functions – Support Vector Machines.

UNIT-III TREE AND PROBABILISTIC MODELS


9

Learning with Trees – Decision Trees – Constructing Decision Trees – Classification and Regression Trees – Ensemble Learning – Boosting – Bagging – Different ways to Combine Classifiers – Probability and Learning – Data into Probabilities – Basic Statistics – Gaussian Mixture Models – Nearest Neighbor Methods – Unsupervised Learning – K means Algorithms – Vector Quantization – Self Organizing Feature Map

UNIT IV DIMENSIONALITY REDUCTION AND EVOLUTIONARY MODELS

9

Dimensionality Reduction – Linear Discriminant Analysis – Principal Component Analysis – Factor Analysis – Independent Component Analysis – Locally Linear Embedding – Isomap – Least Squares Optimization – Evolutionary Learning – Genetic algorithms – Genetic Offspring: – Genetic Operators – Using Genetic Algorithms – Reinforcement Learning – Overview – Getting Lost Example – Markov Decision Process


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UNIT V GRAPHICAL MODELS

Markov Chain Monte Carlo Methods – Sampling – Proposal Distribution – Markov Chain Monte Carlo – Graphical Models – Bayesian Networks – Markov Random Fields – Hidden Markov Models – Tracking Methods

9

Total : 45 hrs

REFERENCES:

7. Elthem Alpaydin, — Introduction to Machine Learning 3e (Adaptive Computation and Machine Learning Series), Third Edition, MIT Press, 2014
8. Jason Bell, — Machine Learning – Hands-on for Developers and Technical Professionals I, First Edition, Wiley, 2014
9. Peter Flach, — Machine Learning: The Art and Science of Algorithms that Make Sense of Data, First Edition, Cambridge University Press, 2012.
10. Stephen Marsland, — Machine Learning – An Algorithmic Perspective, Second Edition, Chapman and Hall/CRC Machine Learning and Pattern Recognition Series, 2014.
12. Tom M Mitchell, — Machine Learning I, First Edition, McGraw Hill Education, 2013.

2225E32B-SPEECH PROCESSING AND SYNTHESIS

LTPC

3003

OBJECTIVES

- To understand the mathematical foundations needed for speech processing
- To understand the basic concepts and algorithms of speech processing and synthesis
- To familiarize the students with the various speech signal representation, coding and recognition techniques
- To appreciate the use of speech processing in current technologies and to expose the students to real-world applications of speech processing

UNIT – I FUNDAMENTALS OF SPEECH PROCESSING

9

Introduction – Spoken Language Structure – Phonetics and Phonology – Syllables and Words – Syntax and Semantics – Probability, Statistics and Information Theory – Probability Theory – Estimation Theory – Significance Testing – Information Theory.

UNIT-II SPEECH SIGNAL REPRESENTATIONS AND CODING

9


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51

Overview of Digital Signal Processing – Speech Signal Representations – Short time Fourier Analysis
Acoustic Model of Speech Production – Linear Predictive Coding – Cepstral Processing
Formant Frequencies – The Role of Pitch – Speech Coding – LPC Coder.

UNIT III SPEECH RECOGNITION

Hidden Markov Models – Definition – Continuous and Discontinuous HMMs – Practical Issues
Limitations. Acoustic Modeling – Variability in the Speech Signal – Extracting Features – Phonetic
Modeling – Adaptive Techniques – Confidence Measures – Other Techniques.

UNIT-IV TEXT ANALYSIS

Lexicon – Document Structure Detection – Text Normalization – Linguistic Analysis
– Homograph Disambiguation – Morphological Analysis – Letter-to-sound Conversion –
Prosody – Generation Schematic – Speaking Style – Symbolic Prosody – Duration Assignment –
Pitch Generation

UNIT-V- SPEECH SYNTHESIS

Attributes – Formant Speech Synthesis – Concatenative Speech Synthesis – Prosodic
Modification of Speech –
Source Filter Models for Prosody Modification Evaluation of TTS Systems.

TOTAL:

45 PERIODS

REFERENCES:

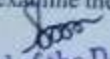
1. Joseph Mariani, — Language and Speech Processing I, Wiley, 2009.
2. Lawrence Rabiner and Biing-Hwang Juang, — Fundamentals of Speech Recognition I, Prentice Hall Signal Processing Series, 1993.
3. Sadaoki Furui, — Digital Speech Processing: Synthesis and Recognition, Second Edition, (Signal Processing and Communications I), Marcel Dekker, 2000.
4. Thomas F. Quatieri, — Discrete-Time Speech Signal Processing I, Pearson Education, 2002.
5. Xuedong Huang, Alex Acero, Hsiao-Wuen Hon, — Spoken Language Processing – A guide to Theory, Algorithm and System Development I, Prentice Hall PTR, 2001.

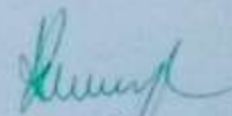
22250E33B- RECONFIGURABLE COMPUTING

LTPC
4004

OBJECTIVES:

- To understand the need for reconfigurable computing
- To expose the students to various device architectures
- To examine the various reconfigurable computing systems


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- To understand the different types of compute models for programming reconfigurable architectures
- To expose the students to HDL programming and familiarize with the development environment
- To expose the students to the various placement and routing protocols
- To develop applications with FPGAs

UNIT I DEVICE ARCHITECTURE

General Purpose Computing Vs Reconfigurable Computing – Simple Programmable Logic Devices – Complex Programmable Logic Devices – FPGAs – Device Architecture – Case Studies.

UNIT II RECONFIGURABLE COMPUTING ARCHITECTURES AND SYSTEMS

Reconfigurable Processing Fabric Architectures – RPF Integration into Traditional Computing Systems – Reconfigurable Computing Systems – Case Studies – Reconfiguration Management.

UNIT III PROGRAMMING RECONFIGURABLE SYSTEMS

Compute Models – Programming FPGA Applications in HDL – Compiling C for Spatial Computing

– Operating System Support for Reconfigurable Computing. UNIT IV MAPPING DESIGNS TO RECONFIGURABLE DEVICES
The Design Flow – Technology Mapping – FPGA Placement and Routing – Configuration Bitstream Generation – Case Studies with Appropriate Tools.

UNIT V APPLICATION DEVELOPMENT WITH FPGAS

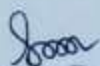
Case Studies of FPGA Applications – Systems on a Programmable Chip (SoPC) Designs.

9

TOTAL: 45 PERIODS

REFERENCES:

6. Christophe Bobda, — Introduction to Reconfigurable Computing – Architectures, Algorithms and Applications I, Springer, 2010.
7. Maya B. Gokhale and Paul S. Graham, — Reconfigurable Computing: Accelerating Computation with Field Programmable Gate Arrays I, Springer, 2005.
8. FPGA Frontiers: New Applications in Reconfigurable Computing, 2017, Nicole Hemsoth, Timothy Prickett Morgan, Next Platform.
9. Reconfigurable Computing: From FPGAs to Hardware/Software Codesign 2011 Edition, Joao Cardoso (Editor), Michael Hübn, Springer
10. Scott Hauck and Andre Dehon (Eds.), — Reconfigurable Computing – The Theory and Practice of FPGA-



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OBJECTIVES:

- Build a solid foundation and acquire the vocabulary you need to supervise or to communicate with others who use these tools.
- To have ability to design drugs.
- To understand Evolutionary Trees and Phylogeny.
- Learn the key methods and tools used in bioinformatics.

UNIT I FUNDAMENTALS 7

The Central Dogma – Killer Application – Parallel Universes – Watson’s Definition – Top Down Vs Bottom Up Approach – Information Flow – Conversance – Communications.

UNIT II DATABASE AND NETWORKS 9

Definition – Data Management – Data Life Cycle – Database Technology – Interfaces – Implementation – Networks Communication Models – Transmission Technology – Protocols – Bandwidth – Topology – Contents – Security – Ownership – Implementation.

UNIT III SEARCH ENGINES AND DATA VISUALIZATION 10

Search Process – Technologies – Searching and Information Theory – Computational Methods – Knowledge Management – Sequence Visualizations – Structure Visualizations – User Interfaces – Animation Vs Simulation.

UNIT IV STATISTICS- DATA MINING AND PATTERN MATCHING 11

Statistical Concepts – Micro Arrays – Imperfect Data – Basics – Quantifying – Randomness – Data Analysis – Tools Selection – Alignment – Clustering – Classification – Data Mining Methods – Technology – Infrastructure Pattern Recognition – Discovery – Machine Learning – Text Mining – Pattern Matching Fundamentals – Dot Matrix Analysis – Substitution Matrix – Dynamic Programming – Word Method – Bayesian Method – Multiple Sequence Alignment Tools.

UNIT V MODELING SIMULATION AND COLLABORATION 8

Drug Discovery Fundamentals – Protein Structure – System Biology Tools – Collaboration and Communication – Standards – Issues – Case Study.

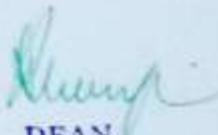
Total: 45hrs**TEXT BOOK:**

1. Bryan Bergeron, “Bio Informatics Computing”, Prentice Hall, 2003.

REFERENCES:

3. T.K. Affward, D.J. Parry Smith, “Introduction to Bio Informatics”, Pearson Education, 2001.
4. Pierre Baldi, Soren Brunak, “Bio Informatics The Machine Learning Approach”, 2nd Edition, First East West Press, 2003.


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OBJECTIVES:

- Understand the characteristics of web applications
- Learn to Model web applications
- Be aware of Systematic design methods
- Be familiar with the testing techniques for web applications

UNIT I INTRODUCTION TO WEB ENGINEERING

Motivation, Categories of Web Applications, Characteristics of Web Applications, Requirements of Engineering in Web Application
Web Engineering-Components of Web Engineering Web Engineering Process-Communication-Planning.

UNIT II WEB APPLICATION ARCHITECTURES & MODELLING WEB APPLICATIONS

9

Introduction-Categorizing Architectures Specifics of Web Application Architectures, Components of a Generic Web Application
Architecture- Layered Architectures, 2-Layer Architectures, N-Layer Architectures-Data aspect Architectures, Database
centric Architectures- Architectures for Web Document Management- Architectures for Multimedia Data-Modeling Specifics
Web Engineering, Levels, Aspects, Phases Customization, Modeling Requirements, Hypertext Modeling, Hypertext
structure Modeling Concepts, Access Modeling Concepts, Relation to Content Modeling, Presentation Modeling, Relation
Hypertext Modeling, Customization Modeling, Modelling Framework-Modeling languages-Analysis Modeling for Web Apps-
Content Model-The Interaction Model-Configuration Model.

UNIT III WEB APPLICATION DESIGN

9

Design for Web Apps- Goals-Design Process-Interactive Design- Principles and Guidelines Workflow-Preliminaries-Design Steps
Usability-Issues-Information Design Information Architecture- structuring- Accessing Information-Navigation Design- Functional
Design-WebApp Functionality-Design Process-Functional Architecture- Detailed Functional Design

UNIT IV TESTING WEB APPLICATIONS

9

Introduction-Fundamentals-Test Specifics in Web Engineering-Test Approaches Conventional Approaches, Agile Approaches-
Testing concepts-Testing Process-Test Scheme Test Methods and Techniques- Link Testing- Browser Testing-Usability Testing
Load, Stress, and Continuous Testing, Testing Security, Test-driven Development, - Content Testing-User Interface testing
Usability Testing-Compatibility Testing Component Level Testing-Navigation Testing-Configuration testing-Security and
Performance Testing- Test Automation.

UNIT V PROMOTING WEB APPLICATIONS AND WEB PROJECT MANAGEMENT

9

Introduction-challenges in launching the web Application-Promoting Web Application Content Management-Usage Analysis-
Web Project Management-Challenges in Web Project Management-Managing Web Team- Managing the Development Process of
Web Application- Risk, Developing a Schedule, Managing Quality, Managing Change, Tracking the Project. Introduction to nodeJS
websockets.

TOTAL: 45 PERIODS

REFERENCES:

1. Chris Bates, — Web Programming: Building Internet Applications I, Third Edition, Wiley India Edition, 2007.


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22250E25C- LANGUAGE TECHNOLOGIES

LTPC
4004

OBJECTIVES:

- To learn the fundamentals of natural language processing
- To appreciate the use of CFG and PCFG in NLP
- To understand the role of semantics and pragmatics

UNIT I INTRODUCTION

9

Words-Regular Expressions and Automata- Words and Transducers-N-grams-Part-of-Speech-Tagging- Hidden Markov and Maximum Entropy Models.

UNIT II SPEECH

9

Speech-Phonetics-Speech Synthesis-Automatic Speech Recognition-Speech Recognition:- Advanced Topics-Computational Phonology

UNIT III SYNTAX

9

Formal Grammar of English-Syntactic Parsing-Statistical Parsing-Features and Unification - Language and Complexity.

UNIT IV SEMANTICS AND PRAGMATICS

9

The Representation of Meaning-Computational Semantics-Lexical Semantics Computational Lexical Semantics -Computational Discourse

UNIT V APPLICATIONS

9

Information Extraction-Question Answering and Summarization Dialogue and Conversational Agents-Machine Translation.

TOTAL:45 PERIODS

OUTCOMES:


Upon completion of this course, the students should be able to:

- To tag a given text with basic Language features
- To design an innovative application using NLP components
- To implement a rule based system to tackle morphology/syntax of a language
- To design a tag set to be used for statistical processing for real-time applications
- To compare and contrast use of different statistical approaches for different types of NLP applications.

REFERENCES:

1. Breck Baldwin, "Language Processing with Java and LingPipe Cookbook", Atlantic Publisher, 2010.
2. Daniel Jurafsky, "Speech and Language Processing: An Introduction to Natural Language Processing, Computational Linguistics Speech", Pearson Publication, 2014.
3. Nitin Indurkha and Fred J. Damerau, "Handbook of Natural Language Processing", Second Edition, Chapman and Hall/CRC Press, 2010.
4. Richard M Reese, "Natural Language Processing with Java", O_Reilly Media, 2015.
5. Steven Bird, Ewan Klein and Edward Loper, "Natural Language Processing with Python", First Edition, O_Reilly Media, 2009.


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OBJECTIVES:

- To understand the basics of Information Retrieval.
- To understand machine learning techniques for text classification and clustering.
- To understand various search engine system operations.
- To learn different techniques of recommender system.

UNIT I INTRODUCTION

9

Information Retrieval – Early Developments – The IR Problem – The User's Task – Information versus Data Retrieval - The IR System – The Software Architecture of the IR System – The Retrieval and Ranking Processes - The Web – The e-Publishing Era – How the web changed Search – Practical Issues on the Web – How People Search – Search Interfaces Today – Visualization in Search Interfaces.

UNIT II MODELING AND RETRIEVAL EVALUATION

9

Basic IR Models - Boolean Model - TF-IDF (Term Frequency/Inverse Document Frequency) Weighting - Vector Model – Probabilistic Model – Latent Semantic Indexing Model – Neural Network Model – Retrieval Evaluation – Retrieval Metrics – Precision and Recall – Reference Collection – User-based Evaluation – Relevance Feedback and Query Expansion – Explicit Relevance Feedback.

UNIT III TEXT CLASSIFICATION AND CLUSTERING

9

A Characterization of Text Classification – Unsupervised Algorithms: Clustering – Naïve Text Classification – Supervised Algorithms – Decision Tree – k-NN Classifier – SVM Classifier – Feature Selection or Dimensionality Reduction – Evaluation metrics – Accuracy and Error – Organizing the classes – Indexing and Searching – Inverted Indexes – Sequential Searching – Multi-dimensional Indexing.

UNIT IV WEB RETRIEVAL AND WEB CRAWLING

9

The Web – Search Engine Architectures – Cluster based Architecture – Distributed Architectures– Search Engine Ranking – Link based Ranking – Simple Ranking Functions – Learning to Rank –Evaluations – Search Engine Ranking – Search Engine User Interaction – Browsing – Applications of a Web Crawler – Taxonomy – Architecture and Implementation – Scheduling Algorithms –Evaluation.

UNIT V RECOMMENDER SYSTEM

9

Recommender Systems Functions – Data and Knowledge Sources – Recommendation Techniques – Basics of Content-based Recommender Systems – High Level Architecture – Advantages and Drawbacks of Content-based Filtering – Collaborative Filtering – Matrix factorization models – Neighborhood models..

TOTAL: 45 PERIODS**OUTCOMES:**

At the end of the course, the student should be able to:


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- Use an open source search engine framework and explore its capabilities
- Apply appropriate method of classification or clustering.
- Design and implement innovative features in a search engine.
- Design and implement a recommender system.

TEXTBOOKS:

1. Ricardo Baeza-Yates and Berthier Ribeiro-Neto, —Modern Information Retrieval: The Concepts and Technology behind Search, Second Edition, ACM Press Books, 2011.
6. Ricci, F, Rokach, L, Shapira, B, Kantor, —Recommender Systems Handbook, First Edition, 2011.

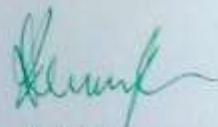
REFERENCES:

5. C. Manning, P. Raghavan, and H. Schütze, —Introduction to Information Retrieval, Cambridge University Press, 2008.
6. Stefan Buettcher, Charles L. A. Clarke and Gordon V. Cormack, —Information Retrieval: Implementing and Evaluating Search Engines, The MIT Press, 2010.



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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
Value added courses

235150VR- VIRTUAL REALITY

UNIT -I INTRODUCTION TO VIRTUAL REALITY (VR)

Defining Virtual Reality, Key elements of virtual reality experience, Virtual Reality, Telepresence, Augmented Reality and Cyberspace.

UNIT-II INPUT DEVICES: (TRACKERS, NAVIGATION, AND GESTURE INTERFACES)

Three-dimensional position trackers, navigation and manipulation, interfaces and gesture interfaces.

UNIT-III MODELING:

Geometric modeling, Kinematics modeling, Physical modeling, Behaviour modeling, Model management.

UNIT-IV AUGMENTED REALITY (AR)

Taxonomy, Technology and Features of Augmented Reality, AR VsVR, Challenges with AR, AR systems and functionality, Augmented Reality Methods, Visualization Techniques for Augmented Reality, Enhancing interactivity in AR

UNIT-V INTERACTION & AUDIO

Interaction - Motor Programs and Remapping, Locomotion, Manipulation, Social Interaction. Audio -The Physics of Sound, The Physiology of Human Hearing, Auditory Perception, Auditory Rendering


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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Value added courses

23S150STA SOFTWARE TESTING AUTOMATION

UNIT - I INTRODUCTION TO VIRTUAL REALITY (VR)

Defining Virtual Reality, Key elements of virtual reality experience, Virtual Reality, Telepresence, Augmented Reality and Cyberspace.

UNIT-II INPUT DEVICES: (TRACKERS, NAVIGATION, AND GESTURE INTERFACES)

Three-dimensional position trackers, navigation and manipulation, interfaces and gesture interfaces.

UNIT-III MODELING

Geometric modeling, Kinematics modeling, Physical modeling, Behaviour modeling, Model management.


UNIT-IV AUGMENTED REALITY (AR)

Taxonomy, Technology and Features of Augmented Reality, AR VsVR, Challenges with AR.

UNIT-V AR TECHNIQUES

AR systems and functionality, Augmented Reality Methods, Visualization Techniques for


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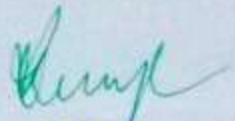

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Augmented Reality, Enhancing interactivity in AR Environments.

Duration:45hours



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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
Value added courses

235150NN NEURAL NETWORKS

UNIT I FUNDAMENTALS OF NEURAL NETWORKS

Neuron, Nerve Structure and Synapse, Artificial Neuron and its Model, Activation Functions, Neural Network Architecture: Single Layer and Multilayer Feed Forward Networks, Recurrent Networks, Various Learning Techniques; Perception and Convergence Rule, Auto-Associative and Hetero-Associative Memory

UNIT II BACKPROPAGATION NETWORKS

Back Propagation Networks) Architecture: Perceptron Model, Solution, Single Layer Artificial Neural Network, Multilayer Perceptron Model; Back Propagation Learning Methods, Effect of Learning Rule Co - Efficient ;Back Propagation Algorithm, Factors Affecting Backpropagation Training, Applications

UNIT III COMPETITIVE NEURAL NETWORKS

Kohonen's Self Organizing Map - SOM Architecture, learning procedure - Application; Learning Vector Quantization - learning by LVQ; Adaptive Resonance Theory - Learning procedure - Applications.

UNIT IV PARAMETRIC MACHINE LEARNING

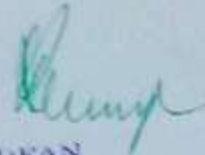
Logistic Regression: Classification and representation - Cost function - Gradient descent - Advanced optimization - Regularization - Solving the problems on overfitting, Perceptron -Neural Networks -

UNIT-V LINERITY

Multi - class Classification - Backpropagation - Non-linearity with activation functions (Tanh, Sigmoid, Relu, PRelu) - Dropout as regularization.

Duration:45hours


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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
Minutes of the meeting of the Board of Studies (BoS)

Date: 06.03.2022

Venue: CSE ICT CLASSROOM

Time: 10.30 a.m

Members present:

Chair: Prof.Dr. Dr.R.Latha, Ph.D, HOD/CSE

<https://meet.google.com/qrs-xyxx-hmf>

External Members

S.No	Name/Degree/Designation	Institute/Organization/ Full address	Online/ Physical	Signature (scan, if online)
1	Dr. S.A.SAHAAYA ARUL MARY	Professor and Head of CSE Department, Saranathan College of Engineering	Online	
2	Mr.V. PRASANNA VENKATESH	Senior Data Analyst STAPLES Inc. USA	Online	



Internal Members

S.No.	Name/Degree/Designation	Department	Online/ Physical	Signature (scan, if online)
1.	Dr.R.Latha HOD/CSE	CSE	Physical	
2.	Prof.Dr.S.Nithyanandam Ph.D	CSE	Physical	
3.	Prof.S JANCY SICKORY DAISY, M.Tech, Assistant Professor	CSE	Physical	
4.	Prof.K.JAYANTHI, M.E, Assistant Professor	CSE	Physical	
5.	Prof.Dr.L.S. Usharani Ph.D, Professor	CSE	Physical	
6.	Prof.Dr.N.Arularasan Ph.D/ Associate Professor	CSE	Physical	
7.	Prof.R.Tamizhselvan M.E, Dean	MECH	Physical	
8.	Dr.K.Padmapiya Ph.D/ Associate Professor	CSE	Physical	

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Invited Participants

S.No.	Name/Degree/Designation	Department/Class Institute/Organization/Address	Online/ Physical	Signature (scan, if online)
1	Mr.Naveen B.E/ Data center Architect	TCS, Chennai	Physical	
2	Mr.N.Mohamed Wasif	Student	Physical	

Agenda:

1. To Confirm the previous Meeting Minutes
2. To discuss the action taken on the previous Meeting Minutes
3. To scrutinize the stakeholder feed backs on B. Tech (FT/PT).
4. To Introduce new programme of B. Tech Artificial Intelligence and Data Science.
5. To recommend the panel of Examiners for B. Tech(FT/PT).
6. To recommended to value added courses conducting for B.Tech CSE & AIDS student.
7. To Introduce new courses for B.Tech (PT),M.Tech(PT&FT)


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MINUTES OF THE MEETING

At the outset, the Chairman BOS welcomed the members for attending the meeting of the Board of Studies. In her introductory remarks, she described the agenda items.

Agendum 1:
Discussion: To confirm the previous BOS Meeting Minutes and to discuss the action taken on the previous BoS Meeting Minutes.
Resolution: The chairman confirmed the previous meeting minutes of BoS and discussed the action taken on the previous BOS Meeting Minutes.
Agendum 2:
Discussion: To scrutinize the abstract of stakeholders feedback on existing curriculum and syllabi for B.TECH-CSE (Full Time/Part Time) and M.Tech-Computer Science and Engineering((Full Time/Part Time).
Resolution: The members of the Board thoroughly scrutinized the existing curriculum and syllabi and the abstract of stakeholders feedback on B.TECH-CSE (Full Time/Part Time) and M.Tech-Computer Science and Engineering (Full Time/Part Time) and resolved to revise the curriculum in the subsequent syllabus revision.
Agendum 3:
Discussion: To introduce 12 new courses for B.Tech (PT), 8 new courses for M.Tech (FT) and also 8 new courses for M.Tech (PT) CSE
Resolution: The members of the board also scrutinized and updated the new courses.
Agendum 4:
Discussion: To Introduce a new programme of B.Tech Artificial Intelligence and Data Science.
Resolution: The members of the board have unanimously recommended to introduce the Introduce new programme of B.Tech Artificial Intelligence and Data Science.
Agendum 5:
Discussion: To recommend the panel of Examiners for B.Tech(FT/PT) and for M.Tech-Computer Science and Engineering(FT/PT)
Resolution: The members of the board also scrutinized and updated the panel of examiners and recommended the panel of examiners for the B.TECH -CSE (FT/PT) & M.Tech-Computer Science and Engineering(FT/PT), and submitted the same for the Academic Council for its approval.
Agendum 6:
Discussion: To recommend the value added courses conducting for B.Tech CSE & AIDS student
B.Tech-CSE <ul style="list-style-type: none">➤ Virtual Reality➤ Software Testing Automation➤ Neural Networks➤ Deep Learning
B.Tech-AI&DS <ul style="list-style-type: none">➤ Introduction to Java➤ Web Development

List of new courses

B.Tech(PT) CSE	Problem Solving and Python Programming	22150C15P
B.Tech(PT) CSE	Programming in C	22150C22P
B.Tech(PT) CSE	Software Engineering Fundamentals	22150H41P
B.Tech(PT) CSE	Internet Programming	22150H42P
B.Tech(PT) CSE	Cryptography and Network Security	22150H61P
B.Tech(PT) CSE	Grid and Cloud Computing	22150H72P
B.Tech(PT) CSE	Data Warehousing and Data Mining	22150E44BP
B.Tech(PT) CSE	Professional Ethics in Engineering	22150E44CP
B.Tech(PT) CSE	Graph Theory And Applications	22150E64CP
B.Tech(PT) CSE	Cyber Forensics	22150E74DP
B.Tech(PT) CSE	Information Retrieval Techniques	22150E74BP
B.Tech(PT) CSE	Ad hoc and Sensor Networks	22150E54AP
M.Tech(FT) CSE	Machine Learning Techniques	22250H13
M.Tech(FT) CSE	Internet of Things	22250H23
M.Tech(FT) CSE	Web Engineering	22250E16B
M.Tech(FT) CSE	Information Retrieval Techniques	22250E24C
M.Tech(FT) CSE	Language Technologies	22250E25C
M.Tech(FT) CSE	Speech Processing and Synthesis	2225E32B
M.Tech(FT) CSE	Reconfigurable Computing	22250E33B
M.Tech(FT) CSE	Bio-inspired Computing	22250E34B
M.Tech(PT) CSE	Internet of Things	22250H22P
M.Tech(PT) CSE	Machine Learning Techniques	22250E32P
M.Tech(PT) CSE	Information Retrieval Techniques	22250E23CP
M.Tech(PT) CSE	Speech Processing and Synthesis	22250E51BP
M.Tech(PT) CSE	Reconfigurable Computing	22250E52BP
M.Tech(PT) CSE	Bio-inspired Computin	22250E53BP
M.Tech(PT) CSE	Web Engineerin	22250E33BP
M.Tech(PT) CSE	Language Technologies	22250E23DP

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SCHOOL OF ENGINEERING AND TECHNOLOGY

**DEPARTMENT OF
ARTIFICIAL INTELLIGENCE AND DATA SCIENCE**

PROGRAM HANDBOOK

B.Tech – FULL TIME

[Regulation 2022]

**I - VIII SEMESTERS CURRICULUM
SEMESTER I**

Sl. No.	COURSE CODE	COURSE TITLE	L	T	P	C
THEORY						
1.	22147IP	Induction Programme	-	-	-	0
2.	22147S11	Professional English - I	3	0	0	3
3.	22148S12	Matrices and Calculus	3	1	0	4
4.	22149S13	Engineering Physics	3	0	0	3
5.	22149S14	Engineering Chemistry	3	0	0	3
6.	22150S15	Problem Solving and Python Programming	3	0	0	3
PRACTICALS						
7.	22150L16	Problem Solving and Python Programming Laboratory	0	0	4	2
8.	22149L17	Physics and Chemistry Laboratory	0	0	4	2
9.	22147L18	Communication Laboratory – I	0	0	2	1
TOTAL			15	1	10	21

SEMESTER II

Sl. No.	COURSE CODE	COURSE TITLE	L	T	P	C
THEORY						
1.	22147S21	Professional English – II	3	0	0	3
2.	22148S22	Statistics and Numerical Methods	3	1	0	4
3.	22149S23A	Physics for Information Science	3	0	0	3
4.	22154S24	Engineering Graphics	2	0	4	4
5.	22153S25A	Basic Electrical and Electronics Engineering	3	0	0	3
6.	221AIDS26	Data Structures Design	3	0	0	3
PRACTICALS						
7.	22154L27	Engineering Practices Laboratory	0	0	4	2
8.	221AIDL28	Data Structures Design Laboratory	0	0	4	2
9.	22147L29	Communication Laboratory – II	0	0	4	2
TOTAL			17	1	16	26


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SEMESTER III

Sl. No	COURSE CODE	COURSE TITLE	L	T	P	C
THEORY						
1.	22148S31A	Discrete Mathematics	3	1	0	4
2.	221AIDS32	*Digital Principles and Computer Organization	3	0	2	4
3.	221AIDC33	Database Design and Management	3	0	0	3
4.	221AIDC34	*Design and Analysis of Algorithm	3	0	2	4
5.	221AIDC35	*Data Exploration and Visualization	3	0	2	4
6.	221AIDC36	Artificial Intelligence	3	0	0	3
PRACTICALS						
7.	221AIDL37	Database Design and Management Laboratory	0	0	4 4 3	2
8.	221AIDL38	Artificial Intelligence Laboratory	0	0	3	2
9.	221AIDL39	Professional Development	0	0	2	1
TOTAL			18	1	14	27

SEMESTER IV

Sl. No	COURSE CODE	COURSE TITLE	L	T	P	C
THEORY						
1.	22148S41A	Probability and Statistics	3	1	0	4
2.	221AIDC42	*Operating Systems	3	0	2	4
3.	221AIDC43	Machine Learning	3	0	0	3
4.	221AIDC44	Fundamentals of Data Science and Analysis	3	0	0	3
5.	221AIDC45	*Computer Networks	3	0	2	4
6.	22149S46	Environmental Sciences and Sustainability	2	0	0	2
PRACTICALS						
7.	221AIDL47	Data Science and Analysis Laboratory	0	0	4	2
8.	221AIDL48	Machine Learning Laboratory	0	0	4	2
TOTAL			17	0	12	24


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SEMESTER V

Sl. No	COURSE CODE	COURSE TITLE	L	T	P	C
THEORY						
1.	221AIDC51	Deep Learning	3	0	0	3
2.	221AIDC52	Data and Information Security	3	0	0	3
3.	221AIDC53	Distributed Computing	3	0	0	3
4.	221AIDC54	*Big Data Analytics	2	0	2	3
5.	221AIDC55_	*Professional Elective I	2	0	2	3
6.	221AIDC56_	*Professional Elective II	2	0	2	3
7.	22147MC57_	Mandatory Course - I	3	0	0	0
PRACTICALS						
8.	221AIDL58	Deep Learning Laboratory	0	0	4	2
9.	221AIDL59	Summer internship	0	0	0	2
TOTAL			18	0	10	22

SEMESTER VI

Sl. No	COURSE CODE	COURSE TITLE	L	T	P	C
THEORY						
1.	22152S61	*Embedded Systems and IOT Design	3	0	2	4
2.	221_ _OE62_	Open Elective - I	3	0	0	3
3.	221AIDC63_	*Professional Elective – III	2	0	2	3
4.	221AIDC64_	*Professional Elective – IV	2	0	2	3
5.	221AIDC65_	*Professional Elective – V	2	0	2	3
6.	221AIDC66_	*Professional Elective – VI	2	0	2	3
7.	22147MC67_	Mandatory Course - II	3	0	0	0
TOTAL			17	0	10	19

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SEMESTER VII

Sl. No	COURSE CODE	COURSE TITLE	L	T	P	C
THEORY						
1.	22147S71	Human Values and Ethics	2	0	0	2
2.	221_ _OE73_	Open Elective – II	3	0	0	3
3.	221_ _OE74_	Open Elective – III	3	0	0	3
4.	221_ _OE75_	Open Elective – IV	3	0	0	3
5.	22160E75_	Elective Management	3	0	0	3
TOTAL			14	0	0	14

SEMESTER VIII

Sl. No	COURSE CODE	COURSE TITLE	L	T	P	C
PRACTICALS						
1.	221AIDC81	Project Work/ Internship	0	0	20	10
TOTAL			0	0	20	10
TOTAL NO. OF CREDITS:						163


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LIST OF ELECTIVES

ELECTIVE - I (SEMESTER V)

Sl. No	COURSE CODE	COURSE TITLE	L	T	P	C
1.	221AIDC55A	Knowledge Engineering	2	0	2	3
2.	221AIDC55B	Recommender Systems	2	0	2	3
3.	221AIDC55C	Soft Computing	2	0	2	3
4.	221AIDC55D	Text and Speech Analysis	2	0	2	3
5.	221AIDC55E	Business Analytics	2	0	2	3
6.	221AIDC55F	Image and video analytics	2	0	2	3
7.	221AIDC55G	Computer Vision	2	0	2	3

ELECTIVE – II (SEMESTER V)

Sl. No	COURSE CODE	COURSE TITLE	L	T	P	C
1.	221AIDC56A	Cloud Computing	2	0	2	3
2.	221AIDC56B	App Development	2	0	2	3
3.	221AIDC56C	Cloud Services Management	2	0	2	3
4.	221AIDC56D	UI and UX Design	2	0	2	3
5.	221AIDC56E	Software Testing and Automation	2	0	2	3
6.	221AIDC56F	Web Application Security	2	0	2	3
7.	221AIDC56G	Dev-ops	2	0	2	3
8.	221AIDC56H	Principles of Programming Languages	3	0	0	3

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 Chennai - 600 025, INDIA.

ELECTIVE – III (SEMESTER VI)

Sl. No	COURSE CODE	COURSE TITLE	L	T	P	C
1.	221AIDC63A	Cloud Computing	2	0	2	3
2.	221AIDC63B	Virtualization	2	0	2	3
3.	221AIDC63C	Cloud Services Management	2	0	2	3
4.	221AIDC63D	Data Warehousing	2	0	2	3
5.	221AIDC63E	Storage Technologies	2	0	2	3
6.	221AIDC63F	Software Defined Networks	2	0	2	3
7.	221AIDC63G	Stream Processing	2	0	2	3
8.	221AIDC63H	Security and Privacy in Cloud	2	0	2	3

ELECTIVE – IV (SEMESTER VI)

Sl. No	COURSE CODE	COURSE TITLE	L	T	P	C
1.	22AIDC64A	Ethical Hacking	2	0	2	3
2.	22AIDC64B	Digital and Mobile Forensics works	2	0	2	3
3.	22AIDC64C	Social Network Security	2	0	2	3
4.	22AIDC64D	Modern Cryptography	2	0	2	3
5.	22AIDC64E	Engineering Secure Software Systems	2	0	2	3
6.	22AIDC64F	Cryptocurrency and Blockchain Technologies	2	0	2	3
7.	22AIDC64G	Network Security	2	0	2	3
8.	22AIDC64H	Security and Privacy in Cloud	2	0	2	3


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ELECTIVE - V (SEMESTER VI)

Sl. No	COURSE CODE	COURSE TITLE	L	T	P	C
1.	221AIDC65A	Augmented Reality/Virtual Reality	2	0	2	3
2.	221AIDC65B	Multimedia and Animation	2	0	2	3
3.	221AIDC65C	Video Creation and Editing	2	0	2	3
4.	221AIDC65D	UI and UX Design	2	0	2	3
5.	221AIDC65E	Digital marketing	2	0	2	3
6.	221AIDC65F	Multimedia Data Compression and Storage	2	0	2	3
7.	221AIDC65G	Game Development	2	0	2	3
8.	221AIDC65H	Visual Effects	2	0	2	3

ELECTIVE - VI (SEMESTER VI)

Sl. No	COURSE CODE	COURSE TITLE	L	T	P	C
1.	221AIDC66A	Augmented Reality/Virtual Reality	2	0	2	3
2.	221AIDC66B	Robotic Process Automation	2	0	2	3
3.	221AIDC66C	Neural Networks and Deep Learning	2	0	2	3
4.	221AIDC66D	Cyber security	2	0	2	3
5.	221AIDC66E	Quantum Computing	2	0	2	3
6.	221AIDC66F	Cryptocurrency and Blockchain Technologies	2	0	2	3
7.	221AIDC66G	Game Development	2	0	2	3
8.	221AIDC66H	3D Printing and Design	2	0	2	3

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Tamil Nadu - 605 006

ELECTIVE - VII (SEMESTER VII)

Sl. No	COURSE CODE	COURSE TITLE	L	T	P	C
1.	22160E75A	Principles of Management	3	0	0	3
2.	22160E75B	Total Quality Management	3	0	0	3
3.	22160E75C	Industrial Management	3	0	0	3

LIST OF OPEN ELECTIVES

SEMESTER VI OPEN ELECTIVE-I

Sl. No	COURSE CODE	COURSE TITLE	L	T	P	C
1	22155OE61	Climate Change and its Impact	3	0	0	3
2	22153OE61	Renewable Energy System	3	0	0	3
3	22154OE61	Introduction to Industrial Engineering	3	0	0	3
4	22150OE61	Graph Theory	3	0	0	3
5	22152OE61	Deep Learning	3	0	0	3

SEMESTER VII

OPEN ELECTIVE-II

Sl. No	COURSE CODE	COURSE TITLE	L	T	P	C
1	22155OE72	IT in Agriculture System	3	0	0	3
2	22153OE72	Introduction to Control Engineering	3	0	0	3
3	22154OE72	Aviation Management	3	0	0	3
4	22150OE72	Dev-Ops	3	0	0	3
5	22152OE72	Robotics Process Automation	3	0	0	3


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OPEN ELECTIVE-III

Sl. No	COURSE CODE	COURSE TITLE	L	T	P	C
1	22147OE73A	English for Competitive Examinations	3	0	0	3
2	22153OE73A	Renewable Energy Technologies(EEE)	3	0	0	3
3	22153OE73B	Electric and Hybrid Vehicle(EEE)	3	0	0	3
4	22154OE73A	Introduction to non-destructive testing (MECHANICALENGINEERING)	3	0	0	3
5	22154OE73B	Industrial Management	3	0	0	3
6	22152OE73A	Biomedical Instrumentation (ECE)	3	0	0	3
7	22152OE73B	Fundamentals of Electronic Devices and Circuits(ECE)	3	0	0	3

OPEN ELECTIVE-IV

Sl. No	COURSE CODE	COURSE TITLE	L	T	P	C
1	22154OE74A	Additive Manufacturing (MECHANICAL ENGINEERING)	3	0	0	3
2	22154OE74B	Industrial Safety (MECHANICAL ENGINEERING)	3	0	0	3
3	22153OE74A	Sensors (EEE)	3	0	0	3
4	22153OE74B	Electrical, Electronic and Magnetic materials(EEE)	3	0	0	3
5	22152OE74A	Wearable devices (ECE)	3	0	0	3
6	22152OE74B	Medical Informatics(ECE)	3	0	0	3


LIST OF MANDATORY COURSES

MANDATORY COURSE – I (SEMESTER V)

Sl. No	COURSE CODE	COURSE TITLE	L	T	P	C
1.	22147MC57A	Introduction to Women and Gender Studies	3	0	0	0
2.	22147MC57B	Elements of Literature	3	0	0	0
3.	22147MC57C	Film Appreciation	3	0	0	0
4.	22147MC57D	Disaster Risk Reduction and Management	3	0	0	0

MANDATORY COURSE – II (SEMESTER VI)

Sl. No	COURSE CODE	COURSE TITLE	L	T	P	C
1.	22147MC67A	Well Being with Traditional Practices (Yoga, Ayurveda and Siddha)	3	0	0	0
2.	22147MC67B	History of Science and Technology in India	3	0	0	0
3.	22147MC67C	Political and Economic Thought for a Humane Society	3	0	0	0
4.	22147MC67D	State, Nation Building and Politics in India	3	0	0	0
5.	22147MC67E	Industrial Safety	3	0	0	0


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Enc:

1. Annexure –

1. B.Tech (FT)- Artificial Intelligence and Data Science Value Added course.

1. Introduction to JAVA

Syllabus

1. What is Core Java?
2. Java Editions
3. Types of Java Courses
4. Concepts Covered in Core Java
5. Core Java Syllabus
 - Basic of Java
 - Class, Objects, and Types of Classes
 - Packages in Java
 - Data Types in Java
 - Variables, Constraints, and Literals
 - Methods in Java
 - Constructor in Java
 - Modifiers in Java
 - Static Keyword
 - Final Keyword
 - Inner Class in Java
 - Super and this keyword
 - Encapsulation
 - Inheritance
 - Polymorphism
 - Abstraction
6. Complete Industrial Core Java Syllabus and Sub Topics
7. Core Java Vs. Advance Java
8. Different Types of Core Java Frameworks
 - Spring

2. Web Development

1. Web Development Course Syllabus

- 1.1 Basic Web Development Course Syllabus
- 1.2 Advanced Web Development Course Syllabus

2. Web Development Course Topics

- 2.1 Full Stack Web Development Course Syllabus
- 2.2 Front-End Web Development Course Syllabus
- 2.3 Back-End Web Development Course Syllabus
- 2.4 Python for Web Development Syllabus
- 2.5 JavaScript for Web Development Syllabus

3. cs50's Web Programming with Python and JavaScript Syllabus

4. Web Design and Web Development Course Syllabus

4.1 Web Application Course Syllabus


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SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF CIVIL ENGINEERING

MINUTES OF THE MEETING OF THE BOARD OF STUDIES (BOS)

Board: Civil

The Meeting of Board of Studies (BOS) was held as given below:

Name of the Body	Board of Studies
Department	Civil Engineering
Meeting no	12
Date and Time	06.05.2022 and 02.00 PM
Venue	A block Gallery Hall
Members Attended	The details are given in the ANNEXURE-I

AGENDA

1	To confirm the minutes of the previous meetings.
2	To discuss the action taken on the previous meeting minutes.
3	To review the curriculum and syllabus of B.Tech(FT) 2021R, B.Tech (PT) 19R and M.Tech (FT&PT) 19R
4	To scrutinize the stakeholders feedback on B.Tech. (FT/PT) and M.Tech. (FT&PT)
5	To scrutinize the panel of Examiners
6	To discuss the value added courses.
7	To discuss internship/field trip
8	To discuss extension activities for 2022-2023 academic year
9	To discuss mandatory courses
10	Discussion on Coaching for Competitive Exams & Higher Education.
11	Any other matter.

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MINUTES OF THE BOARD OF STUDIES MEETING

Board: Civil

The Chairman of BOS welcomed all the panel members for the meeting. The item listed in the agenda were taken for discussion.

The following are the minutes of the meeting

Agendum 1: Confirmation of the previous Meeting Minutes
Discussion: To confirm the previous BoS Meeting Minutes and to discuss the action taken on the previous BoS Meeting Minutes.
Resolution: Board approved the same
Agendum 2: Action taken on the previous Meeting Minutes
Discussion: Changes in 19R of B.Tech, PT and M.Tech. FT and PT has been discussed.
Resolution: Carried out the advised changes in 19R of B.Tech, PT and M.Tech. FT and PT.
Agendum 3: Scrutiny of stakeholders' feedback on existing curriculum and syllabus.
Discussion: To scrutinize the abstract of stakeholders feedback on existing curriculum and syllabus for B.Tech.-Civil (Full Time/Part Time) and M.Tech.-Structural Engineering (Full Time/Part Time).
Resolution: The members of the Board thoroughly scrutinized the existing curriculum and syllabus and the abstract of stakeholder's feedback on B.Tech. -Civil (Full Time/Part Time) and M.Tech.-Structural Engineering (Full Time/Part Time) and resolved to revise the curriculum in the subsequent syllabus revision.
Agendum 4: Discuss the Programme Educational Objectives (PEOs), Programme Outcomes (POs) and Programme Specific Outcomes (PSOs) of B.Tech. (FT/PT) and M.Tech. (FT/PT).
Discussion: To discuss upon the Programme Educational Objectives (PEOs), Programme Outcomes (POs) and Programme Specific Outcomes (PSOs) of B.Tech. (FT/PT) and M.Tech. (FT/PT).
Resolution: The members of the Board scrutinized the Programme Educational Objectives (PEOs), Programme Outcomes (POs) and Programme Specific Outcomes (PSOs) and resolved to continue with the same for B.Tech (FT/PT) and M.Tech.(FT/PT).
Agendum 5: Introduction of newly added Value added courses
Discussion: To introduce newly added value added courses as follows i) Landscape Architecture ii) ETABS iii) Demolition Engineering iv) Tekla structures v) Sketchup
Resolution: The members of the Board scrutinized the syllabus contents of newly added value added courses and resolved to introduce the same.
Agendum 6: Discussed about the skills, cracking interviews and professional development of students towards the corporate futures.
Discussion: Arrangement for professional development classes for the students of final year.
Resolution: Schedule of classes for the Professional development has been done.
Agendum 7: Discussed about the Department Academic plan
Discussion: To conduct Symposium, Conference, Industrial visit, IPT/ Internship, Seminars.

Socio Technical Projects, Workshops, FDP, Conduct of theory and Practical classes, Remedial classes, Internship, Placement Training, Coaching for Competitive Exams, Semester preparatory Courses, Bridge Courses, Add on courses, Elective courses, phase I projects for M.Tech, Conduct classes for B.Tech (PT) and M.Tech (PT)

Resolution: Planned the Symposium, Conference, Industrial visit, IPT/ Internship, Seminars, Technical Projects, Workshops, FDP, Conduct of theory and Practical classes, Remedial classes, Internship, Placement Training, Coaching for Competitive Exams, Semester preparatory Courses, Bridge Courses, Add on courses, Elective courses, for the students.

The chairman of Board of Studies (BOS) thanked all the members for their active participation and cordially invited them for the next meeting.

After thorough scrutiny of the curriculum and Syllabi and the details of feedback on curriculum received from the Stake holders during the Year 2021-22, the members of the Board have unanimously passed the following resolutions:

Resolved to introduce the following courses in B.Tech (CIVIL Engineering)-Full Time curriculum with effect from 2022-23 as per the guidelines of the All India Council for Technical Education:

Sem I: Communication Laboratory - I - 2credits

Sem-II: Communication Laboratory- II-2 credits

Resolved to introduce the following courses in B.Tech (CIVIL Engineering)-Part Time curriculum with effect from 2022-23 as per the guidelines of the All India Council for Technical Education:

Sem -I: Strength of Materials I - 4 credits

Sem -I: Plane and Geomatic Surveying - 4 credits

Sem -II: Strength of Materials II - 4 credits

Resolved to introduce the following Elective courses in B.Tech (CIVIL Engineering)-Part Time curriculum with effect from 2022-23 as per the guidelines of the All India Council for Technical Education:

Sem -IV: Hard Core Elective I

S.No	Name of the Subject
1	Total Station And GPS Surveying
2	Basic Construction Materials
3	Geographic Information System
4	Construction Methods and Equipment Management

Sem -V: Hard Core Elective II

S.No	Name of the Subject
1	Air Pollution and Control
2	Water and waste water treatment
3	Remote sensing & GIS for rural development
4	Soil Dynamics

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Sem –VI: Hard Core Elective III

S.No	Name of the Subject
1	Advanced Soil Mechanics
2	Advanced Foundation Engineering
3	Applied Environmental Microbiology
4	Engineering Hydrology

Sem –VII: Hard Core Elective IV

S.No	Name of the Subject
1	Applied Seismology for Engineers
2	Earthquake Resistant Design of Foundations
3	Retrofitting and Rehabilitation of Civil Infrastructure
4	Urban Transportation System Planning

Resolved to introduce the following courses in M.Tech (Structural Engineering)-Full Time curriculum with effect from 2022-23 as per the guidelines of the All India Council for Technical Education:

Sem -I: Experimental Techniques -4 credits

Resolved to introduce the following Elective courses in M.Tech (Structural Engineering)-Full Time curriculum with effect from 2022-23 as per the guidelines of the All India Council for Technical Education:

Sem –I: Hard Core Elective I

S.No	Name of the Subject
1	Theory Of Plates
2	Water Resource Engineering
3	Soil Structural Interaction
4	Remote Sensing Essentials

Sem –II: Hard Core Elective II

S.No	Name of the Subject
1	Analysis And Design Of Tall Buildings
2	Soil Dynamics
3	Rock Engineering
4	Advanced Soil Mechanics


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Sem -II: Hard Core Elective III

S.No	Name of the Subject
1	Design of sub structure
2	Advanced Foundation Engineering
3	Development and Applications of Special Concretes
4	Vibration of Continuous Systems

Sem -III: Hard Core Elective IV

S.No	Name of the Subject
1	Optimization of Structures
2	Wind And Cyclone Effects On Structures
3	Urban Transportation System Planning
4	Applied Seismology for Engineers

Sem -III: Hard Core Elective V

S.No	Name of the Subject
1	Design Of Bridges
2	Surface Water Hydrology
3	Unsaturated Soil Mechanics
4	Remote Sensing and GIS for rural development

Sem -III: Hard Core Elective VI

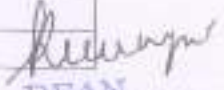
S.No	Name of the Subject
1	Structural Dynamics
2	Water Supply Engineering
3	Water and waste water treatment
4	Applied Environmental Microbiology

Resolved to introduce the following Elective courses in M.Tech (Structural Engineering)-Part Time curriculum with effect from 2022-23 as per the guidelines of the All India Council for Technical Education:

Sem -II: Elective I

S.No	Name of the Subject
1	Theory Of Plates
2	Water Resource Engineering
3	Soil Structural Interaction
4	Remote Sensing Essentials


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Sem -III: Elective II

S.No	Name of the Subject
1	Analysis And Design Of Tall Buildings
2	Soil Dynamics
3	Rock Engineering
4	Advanced Soil Mechanics

Sem -IV: Elective III

S.No	Name of the Subject
1	Advanced Soil Mechanics
2	Advanced Foundation Engineering
3	Development and Applications of Special Concretes
4	Vibration of Continuous Systems

Sem -V: Elective IV

S.No	Name of the Subject
1	Optimization of Structures
2	Wind And Cyclone Effects On Structures
3	Urban Transportation System Planning
4	Applied Seismology for Engineers

Sem -V: Elective V

S.No	Name of the Subject
1	Design Of Bridges
2	Remote Sensing and GIS for rural development
3	Surface Water Hydrology
4	Unsaturated Soil Mechanics

Sem -V: Elective VI

S.No	Name of the Subject
1	Structural Dynamics
2	Water Supply Engineering
3	Water and waste water treatment
4	Applied Environmental Microbiology

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ATTENDANCE OF THE BOARD OF STUDIES MEETING

Board: CIVIL


Date: 15-05-2024 Time: 10.30 am

Venue: Gallery Hall, 'A' Block

The following members were present for the Board of Studies meeting

S.No.	Name/Degree/Designation	Institute/Organization/ Fulladdress	Online/ Physical	Signature
1	Dr.Ashutosh Das/ Professor/Civil	Prist University	Physical	
2	Mr.P.Vadivel/M.tech/ Divisional Engineer	Highways department, Trichy	Physical	
3	Mrs.V.Ramya/ M.tech/Assistant Professor	Government college of Engineering, Thanjavur	Physical	
4	Dr.IraiKarkuzhali	Prist University	Physical	
5	Dr.P.Paramaguru	Prist University	Physical	
6	Dr.R.Siva Samundy	Prist University	Physical	
7	D.Amal Colins	Prist University	Physical	
8	S.Ramakrishnan	Prist University	Physical	
9	D.Jeyakumar	Prist University	Physical	
10	A.Beleiya Mary	Prist University	Physical	
11	K.Shanthi	Prist University	Physical	
12	J.Sandhyaa Jenifer	Prist University	Physical	
13	R.Devi	Prist University	Physical	
14	P.Venkateswaran	Prist University	Physical	
15	S.Ravishankar	Prist University	Physical	
16	M.Karpagam	Prist University	Physical	
17	T.Vidudhalai	Prist University	Physical	
18	S.Vennila	Prist University	Physical	


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B.Tech.Civil Engineering-Part Time-2022R

SEMESTER – I

S. No	Sub. Code	Name of the Subject	Core	L	T	P	C
1	22148S11P	Transforms & Partial Differential Equations	S	2	1	0	4
2	22155C12P	Strength of Materials I	C	3	1	0	4
3	22155C13P	Fluid Mechanics I	C	3	1	0	4
4	22155C14P	Plane and Geodetic Surveying	C	3	1	0	4
5	22155C15P	Irrigation Engineering	C	3	0	0	3
TOTAL							19

SEMESTER – II

S. No	Sub. Code	Name of the Subject	Core	L	T	P	C
1	22148S21P	Numerical Methods	S	3	1	0	4
2	22155C22P	Strength of Materials II	C	3	1	0	4
3	22155C23P	Fluid Mechanics II	C	3	1	0	4
4	22155C24P	Concrete Technology	C	3	1	0	4
5	22155C25P	Soil Mechanics	C	3	1	0	3
TOTAL							19

SEMESTER – III

S. No	Sub. Code	Name of the Subject	Core	L	T	P	C
1	22148S31P	Probability & Statistics	S	3	1	0	4
2	22155C32P	Design of Reinforced Concrete Structures-I	C	3	1	0	4
3	22155C33P	Structural Analysis I	C	3	1	0	4
4	22155C34P	Construction Materials And Practice	C	3	1	0	3
5	22155L35P	Soil Mechanics laboratory	-	0	0	3	2
TOTAL							17

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SEMESTER – IV


S. No	Sub. Code	Name of the Subject	Core	L	T	P	C
1	22155C41P	Design of Reinforced Concrete Structures-II	C	3	1	0	4
2	22155C42P	Structural Analysis II	C	3	1	0	4
3	22155C43P	Environmental Engineering	C	3	1	0	4
4	22155E44-P	Hard Core Elective I	-	3	1	0	4
5	22155L45P	Environmental Engineering Lab	-	0	0	3	2
TOTAL							18

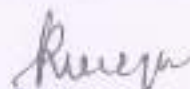
SEMESTER – V

S. No	Sub. Code	Name of the Subject	Core	L	T	P	C
1	22155C51P	Design of Steel Structures	C	3	1	0	4
2	22155C52P	Foundation Engineering	C	3	1	0	4
3	22155C53P	Waste Water Engineering	C	3	1	0	4
4	22155E54-P	Hard Core Elective II	-	3	1	0	4
5	22155L55P	Computer Aided Building Drawing Laboratory	L	0	0	3	2
TOTAL							18

SEMESTER – VI

S. No	Sub. Code	Name of the Subject	Core	L	T	P	C
1	22155C61P	Estimation & Cost Evaluation	C	3	1	0	4
2	22155C62P	Ground Water Hydrology	C	3	1	0	4
3	22155C63P	Construction Project Management	C	3	1	0	4
4	22155E64-P	Hard Core Elective III	-	3	1	0	4
5	22155L65P	Concrete & Transportation Engineering Laboratory	L	0	0	3	2
TOTAL							18


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SEMESTER - VII

S. No	Sub. Code	Name of the Subject	Core	L	T	P	C
1	22155S71P	Total Quality Management	S	3	0	0	3
2	22155C72P	Housing, Planning & Management	C	3	1	0	4
3	22155C73P	Repair And Rehabilitation of Structures	C	3	1	0	4
4	22155E74-P	Hard Core Elective IV	-	3	1	0	4
5	22155P75P	Project Work	-	-	-	12	6
TOTAL							21

LIST OF ELECTIVES

HARD CORE ELECTIVE I

S. No	Sub. Code	Name of the Subject	L	T	P	C
1	22155E44AP	Total Station And GPS Surveying	3	1	0	4
2	22155E44BP	Water Resource Engineering	3	1	0	4
3	22155E44CP	Basic Construction Materials	3	1	0	4
4	22155E44DP	Geographic Information System	3	1	0	4
5	22155E44EP	Construction Methods and Equipment Management	3	1	0	4

HARD CORE ELECTIVE II

S. No	Sub. Code	Name of the Subject	L	T	P	C
1	22155E54AP	Air Pollution and Control	3	1	0	4
2	22155E54BP	Transportation Engineering	3	1	0	4
3	22155E54CP	Water and waste water treatment	3	1	0	4
4	22155E54DP	Remote sensing & GIS for rural development	3	1	0	4
5	22155E54EP	Soil Dynamics	3	1	0	4

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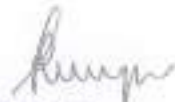
HARD CORE ELECTIVE III

S. No	Sub. Code	Name of the Subject	L	T	P	C
1	22155E64AP	Advanced Soil Mechanics	3	1	0	4
2	22155E64BP	Advanced Foundation Engineering	3	1	0	4
3	22155E64CP	Airport & Harbors	3	1	0	4
4	22155E64DP	Applied Environmental Microbiology	3	1	0	4
5	22155E64EP	Engineering Hydrology	3	1	0	4

HARD CORE ELECTIVE IV

S. No	Sub. Code	Name of the Subject	L	T	P	C
1	22155E74AP	Applied Seismology for Engineers	3	1	0	4
2	22155E74BP	Pre Fabricated Structures	3	1	0	4
3	22155E74CP	Earthquake Resistant Design of Foundations	3	1	0	4
4	22155E74DP	Retrofitting and Rehabilitation of Civil Infrastructure	3	1	0	4
5	22155E74EP	Urban Transportation System Planning	3	1	0	4


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M.Tech.Structural Engineering- Full Time-2022R

SEMESTER - I

S. No	Subject Code	Name of the Subject	L	T	P	C
1	22248S11E	Advanced Engineering Mathematics	3	1	0	4
2	22255C12	Quality Control & Assurance in Construction	3	1	0	4
3	22255C13	Theory of Plasticity and Elasticity	3	1	0	4
4	22255C14	Structural Dynamics	3	1	0	4
5	22255C15	Experimental Techniques	3	1	0	4
6	22255E16A	Hard Core Elective I	3	1	0	3
7	22255L17	Core Practical (Computer Programming Lab)	0	0	3	3
TOTAL						26

SEMESTER - II

S. No	Subject Code	Name of the Subject	L	T	P	C
1	22255C21	Management Information System	3	1	0	4
2	22255C22	Finite Element Analysis	3	1	0	4
3	22255C23	Advanced Concrete Structural Design	3	1	0	4
4	22255E24B	Hard Core Elective -II	3	1	0	3
5	22255E25C	Hard Core Elective -III	3	1	0	3
6	22255L26	Core practical (Software Lab - Finite Element Analysis- ANSYS)	0	0	3	3
7	222TECWR	Technical writing / Seminars	0	0	3	3
TOTAL						24

SEMESTER - III

S. No	Subject Code	Name of the Subject	L	T	P	C
1	22255C31	Advanced Steel Structures	3	1	0	4
2	22255E32C	Hard Core Elective IV	3	1	0	3
3	22255E33A	Hard Core Elective V	3	1	0	3
4	22255E34B	Hard Core Elective VI	3	1	0	3
6	22255P35	Project Work Phase-I	0	0	6	10
TOTAL						23

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SEMESTER – IV

S. No	Subject Code	Name of the Subject	L	T	P	C
1	22255P41	Project Work Phase-II	0	0	12	15
TOTAL						15

LIST OF ELECTIVES

Hard Core Elective-I

S. No	Subject Code	Name of the Subject	L	T	P	C
1	22255E16A	Prestressed Concrete Design	3	1	0	3
2	22255E16B	Theory of Plates	3	1	0	3
3	22255E16C	Water Resource Engineering	3	1	0	3
4	22255E16D	Soil Structural Interaction	3	1	0	3
5	22255E16E	Remote Sensing Essentials	3	1	0	3

Hard Core Elective – II

S. No	Subject Code	Name of the Subject	L	T	P	C
1	22255E24 A	Analysis And Design Of Tall Buildings	3	1	0	3
2	22255E24 B	Advanced Concrete Technology	3	1	0	3
3	22255E24 C	Soil Dynamics	3	1	0	3
4	22255E24 D	Rock Engineering	3	1	0	3
5	22255E24 E	Advanced Soil Mechanics	3	1	0	3

Hard Core Elective – III

S. No	Subject Code	Name of the Subject	L	T	P	C
1	22255E25A	Design of sub structure	3	1	0	3
2	22255E25B	Advanced Foundation Engineering	3	1	0	3
3	22255E25 C	Elements of Earthquake Engineering	3	1	0	3
4	22255E25 D	Development and Applications of Special Concretes	3	1	0	3
5	22255E25 E	Vibration of Continuous Systems	3	1	0	3

Hard Core Elective-IV

S. No	Subject Code	Name of the Subject	L	T	P	C
1	22255E32A	Optimization of Structures	3	1	0	3
2	22255E32B	Wind And Cyclone Effects On Structures	3	1	0	3
3	22255E32C	A seismic Design of Structures	3	1	0	3
4	22255E32D	Urban Transportation System Planning	3	1	0	3
5	22255E32E	Applied Seismology for Engineers	3	1	0	3

Hard Core Elective - V

S. No	Subject Code	Name of the Subject	L	T	P	C
1	22255E33A	Prefabricated Structures	3	1	0	3
2	22255E33B	Design Of Bridges	3	1	0	3
3	22255E33C	Surface Water Hydrology	3	1	0	3
4	22255E33D	Unsaturated Soil Mechanics	3	1	0	3
5	22255E33E	Remote Sensing and GIS for rural development	3	1	0	3

Hard Core Elective - VI

S. No	Subject Code	Name of the Subject	L	T	P	C
1	22255E34A	Offshore Structures	3	1	0	3
2	22255E34B	Structural Dynamics	3	1	0	3
3	22255E34C	Water Supply Engineering	3	1	0	3
4	22255E34D	Water and waste water treatment	3	1	0	3
5	22255E34E	Applied Environmental Microbiology	3	1	0	3

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SEMESTER-I

S.No	Sub.Code	Name of the Subject	L	T	P	C
1	22248S11EP	Advanced Engineering Mathematics	3	1	0	4
2	22255C12P	Quality Control & Assurance in Construction	3	1	0	4
3	22255C13P	Theory of Plasticity and Elasticity	3	1	0	4
4	22255L14P	Computer Programming Lab	0	0	3	3
TOTAL						15

SEMESTER-II

S.No	Sub.Code	Name of the Subject	L	T	P	C
1	22255C21P	Management Information System	3	1	0	4
2	22255C22P	Finite Element Analysis	3	1	0	4
3	22255E23-P	Elective I	3	1	0	3
4	22255L24P	Software Lab- ANSYS	0	0	3	3
5	222TECWRP	Technical Writing/Seminars	0	0	3	3
TOTAL						17

SEMESTER-III

S.No	Sub.Code	Name of the Subject	L	T	P	C
1	22255C31P	Structural Dynamics	3	1	0	4
2	22255C32P	Maintenance and Rehabilitation of Structures	3	1	0	4
3	22255E33-P	Elective II	3	1	0	3
TOTAL						11

SEMESTER-IV

S.No	Sub.Code	Name of the Subject	L	T	P	C
1	22255C41P	Advanced Concrete Structural design	3	1	0	4
2	22255C42P	Advanced Steel Structures	3	1	0	4
3	22255E43-P	Elective III	3	1	0	3
4	22255P44P	Project Work Phase I	0	0	6	10
Total Credits						21

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SEMESTER- V

S.No	Sub.Code	Name of the Subject	L	T	P	C
1	22255E51-P	Elective IV	3	1	0	3
2	22255E52-P	Elective V	3	1	0	3
3	22255E53-P	Elective VI	3	1	0	3
TOTAL						9

SEMESTER-VI

S.No	Sub.Code	Name of the Subject	L	T	P	C
1	22255P61P	Project Work Phase II	0	0	12	15
Total Credits						15

LIST OF ELECTIVES SEMESTER II

ELECTIVE-I

S. No	Sub. Code	Name of the Subject	L	T	P	C
1	22255E23AP	Theory Of Plates	3	1	0	3
2	22255E23BP	Advanced Concrete Technology	3	1	0	3
3	22255E23CP	Water Resource Engineering	3	1	0	3
4	22255E23DP	Soil Structural Interaction	3	1	0	3
5	22255E23EP	Remote Sensing Essentials	3	1	0	3

SEMESTER III

ELECTIVE- II

S. No	Sub. Code	Name of the Subject	L	T	P	C
1	22255E33AP	Prestressed Concrete Design	3	1	0	3
2	22255E33BP	Analysis And Design Of Tall Building	3	1	0	3
3	22255E33CP	Soil Dynamics	3	1	0	3

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4	22255E33DP	Rock Engineering	3	1	0	3
5	22255E33EP	Advanced Soil Mechanics	3	1	0	3

SEMESTER IV

ELECTIVE-III

S. No	Sub. Code	Name of the Subject	L	T	P	C
1	22255E43AP	Design of Sub Structures	3	1	0	3
2	22255E43BP	Advanced Foundation Engineering	3	1	0	3
3	22255E43CP	Elements Of Earthquake Engineering	3	1	0	3
4	22255E43DP	Development and Applications of Special Concretes	3	1	0	3
5	22255E43EP	Vibration of Continuous Systems	3	1	0	3

SEMESTER V

ELECTIVE-IV

S. No	Sub. Code	Name of the Subject	L	T	P	C
1	22255E51AP	Optimization of Structures	3	1	0	3
2	22255E51BP	Wind And Cyclone Effects On Structures	3	1	0	3
3	22255E51CP	A seismic Design of Structures	3	1	0	3
4	22255E51DP	Urban Transportation System Planning	3	1	0	3
5	22255E51EP	Applied Seismology for Engineers	3	1	0	3

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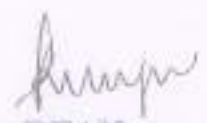
ELECTIVE-V

S. No	Sub. Code	Name of the Subject	L	T	P	C
1	22255E52A	Prefabricated Structures	3	1	0	3
2	22255E52BP	Design of Bridges	3	1	0	3
3	22255E52CP	Remote Sensing and GIS for rural development	3	1	0	3
4	22255E52DP	Surface Water Hydrology	3	1	0	3
5	22255E52EP	Unsaturated Soil Mechanics	3	1	0	3

ELECTIVE-VI

S. No	Sub. Code	Name of the Subject	L	T	P	C
1	22255E53AP	Offshore Structures	3	1	0	3
2	22255E53BP	Structural Dynamics	3	1	0	3
3	22255E53CP	Water Supply Engineering	3	1	0	3
4	22255E53DP	Water and waste water treatment	3	1	0	3
5	22255E53EP	Applied Environmental Microbiology	3	1	0	3


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COURSE OBJECTIVES: To introduce students to various components and design of water supply scheme, water treatment methods, water storage distribution system, sewage treatment and disposal and design of intake structures and sewerage system.

UNIT I WATER SUPPLY

12

Estimation of surface and subsurface water resources - Predicting demand for water- Impurities of water and their significance - Physical, chemical and bacteriological analysis - Waterborne diseases - Standards for potable water. Intake of water: Pumping and gravity schemes.

UNIT II WATER TREATMENT

12

Objectives - Unit operations and processes - Principles, functions, and design of water treatment plant units, aerators of flash mixers, Coagulation and flocculation, - Clariflocculator - Plate and tube settlers - Pulsator clarifier - sand filters - Disinfection - softening, removal of iron and manganese - Defluoridation - Softening - Desalination process - Residue Management - Construction, Operation and Maintenance aspects

UNIT III WATER STORAGE AND DISTRIBUTION

12

Storage and balancing reservoirs - types, location and capacity. Distribution system: layout, hydraulics of pipe lines, pipe fittings, valves including check and pressure reducing valves, meters, analysis of distribution systems, leak detection, maintenance of distribution systems, pumping stations and their operations - House service connections.

UNIT IV PLANNING AND DESIGN OF SEWERAGE SYSTEM

12

Characteristics and composition of sewage - Population equivalent - Sanitary sewage flow estimation - Sewer materials - Hydraulics of flow in sanitary sewers - Sewer design - Storm drainage-Storm runoff estimation - Sewer appurtenances - Corrosion in sewers - Prevention and control - Sewage pumping-drainage in buildings - Plumbing systems for drainage

UNIT V SEWAGE TREATMENT AND DISPOSAL.

12

Objectives - Selection of Treatment Methods - Principles, Functions, - Activated Sludge Process and Extended aeration systems - Trickling filters - Sequencing Batch Reactor(SBR) - UASB - Waste Stabilization Ponds - Other treatment methods - Reclamation and Reuse of sewage - Recent Advances in Sewage Treatment - Construction, Operation and Maintenance aspects. - Discharge standards-sludge treatment -Disposal of sludge

TOTAL: 60 PERIODS

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COURSE OUTCOMES: On completion of the course, the student is expected to

CO1 Understand the various components of water supply scheme and design of intake structure and conveyance system for water transmission

CO2 Understand on the characteristics and composition of sewage, ability to estimate sewage generation and design sewer system including sewage pumping stations

CO3 Understand the process of conventional treatment and design of water and wastewater treatment system and gain knowledge of selection of treatment process and biological treatment process

CO4 Ability to design and evaluate water distribution system and water supply in buildings and understand the self-purification of streams and sludge and septage disposal methods.

CO5 Able to understand and design the various advanced treatment system and knowledge about the recent advances in water and wastewater treatment process and reuse of sewage

TEXTBOOKS:

1. Garg, S.K. Environmental Engineering, Vol.I Khanna Publishers, New Delhi, 2010.
2. Modi, P.N., Water Supply Engineering, Vol.I Standard Book House, New Delhi, 2016.
3. Garg, S.K., Environmental Engineering Vol.II, Khanna Publishers, New Delhi, 2015.
4. Duggal K.N., "Elements of Environmental Engineering" S. Chand and Co. Ltd., New Delhi, 2014.
5. Panmia, B.C., Jain, A.K., and Jain.A.K., Environmental Engineering, Vol.II, Laxmi Publications, 2010.

REFERENCES:

1. Panmia B.C. Ashok Jain and Arun Jain, Water Supply Engineering, Laxmi Publications (P) Ltd., New Delhi 2010.
2. Manual on Water Supply and Treatment, CPHEED, Ministry of Urban Development, Government of India, New Delhi, 1999.
3. Syed R. Qasim and Edward M. Motley Guang Zhu. Water Works Engineering Planning, Design and Operation, Prentice Hall of India Learning Private Limited, New Delhi, 2009.
4. Of Urban Development, Government of India, New Delhi, 2013.
5. Metcalf and Eddy - Waste water Engineering - Treatment and Reuse, Tata Mc. Graw - Hill Company, New Delhi, 2010.

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SOIL STRUCTURAL INTERACTION

L T P C

3 0 0 3

OBJECTIVE:

To study the concept of soil-structure – interaction in the analysis and design of structures.

UNIT I SOIL-FOUNDATION INTERACTION 9

Introduction to soil-foundation interaction problems – Soil behaviour – Foundation behaviour Interface behaviour- Scope of soil foundation interaction analysis- soil response models–Elastic continuum- Two parameter elastic models- Elastic-plastic behaviour- Time dependent behaviour.

UNIT II BEAM ON ELASTIC FOUNDATION- SOIL MODELS 9

Infinite beam – Two-parameters models – Isotropic elastic half space model – Analysis of beams of finite length – combined footings.

UNIT III PLATES ON ELASTIC CONTINUUM 9

Thin and thick rafts – Analysis of finite plates - Numerical analysis of finite plates.

UNIT IV ANALYSIS OF AXIALLY AND LATERALLY LOADED PILES AND PILE GROUPS 9

Elastic analysis of single pile – Theoretical solutions for settlement and load distributions – Analysis of pile group – Interaction analysis – Load distribution in groups with rigid cap – Load deflection prediction for laterally loaded piles – Subgrade reaction and elastic analysis – Interaction analysis – Pile-raft system.

UNIT V GROUND-FOUNDATION-STRUCTURE INTERACTION 9

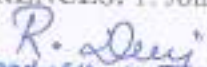
Effect of structure on ground-foundation interaction – Static and dynamic loads- Contact pressure and its estimation – Estimation of the settlement from the constitutive laws – Free-field response – Kinetic interaction – Inertial interaction

TOTAL: 45 PERIODS

OUTCOMES: On completion of the course, the student is expected to be able to

- CO1 Explain the concept of soil structure interaction.
- CO2 Do a static analysis of infinite and finite beams resting on elastic foundation
- CO3 Analyse finite thin and thick plates
- CO4 Do a static and dynamic analysis of soil structure interaction problems
- CO5 Analyze ground foundation and structure interaction problems

REFERENCES: 1. John P. Wolf, (1985) Soil-structure interaction, Prentice Hall, 1987.


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2. Bowels, J.E., "Analytical and Computer methods in Foundation" McGraw Hill Book Co., New York., 1974

3. Desai C.S. and Christian J.T., "Numerical Methods in Geotechnical Engineering" McGraw Hill Book Co. New York,1977.

4. Soil Structure Interaction, the real behaviour of structures, Institution of Structural Engineers, 1989.

5. A.P.S. Selvadurai, Elastic Analysis of Soil Foundation Interaction, Developments in Geotechnical Engg.vol-17, Elsevier Scientific Publishing Co., 1979.

6. Prakash, S., and Sharma, H. D., "Pile Foundations in Engineering Practice."John Wiley & Sons, New York, 1990.

7. Rolando P. Orense, Nawawi Chouw& Michael J. Pender – Soil-Foundation-Structure Interaction

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COURSE OBJECTIVES:

- To introduce the concepts of remote sensing processes and its components.
- To expose the various remote sensing platforms and sensors and to introduce the elements of data interpretation

UNIT I REMOTE SENSING AND ELECTROMAGNETIC RADIATION 9

Definition – components of RS – History of Remote Sensing – Merits and demerits of data collation between conventional and remote sensing methods - Electromagnetic Spectrum – Radiation principles - Wave theory, Planck's law, Wien's Displacement Law, Stefan's Boltzmann law, Kirchoff's law – Radiation sources: active & passive - Radiation Quantities

UNIT II EMR INTERACTION WITH ATMOSPHERE AND EARTH MATERIAL 9

Standard atmospheric profile – main atmospheric regions and its characteristics – interaction of radiation with atmosphere – Scattering, absorption and refraction – Atmospheric windows – Energy balance equation – Specular and diffuse reflectors – Spectral reflectance & emittance – Spectroradiometer – Spectral Signature concepts – Typical spectral reflectance curves for vegetation, soil and water – solid surface scattering in microwave region.

UNIT III ORBITS AND PLATFORMS 9

Motions of planets and satellites - Newton's law of gravitation - Gravitational field and potential - Escape velocity - Kepler's law of planetary motion - Orbital elements and types – Orbital perturbations and maneuvers – Types of remote sensing platforms - Ground based, Airborne platforms and Space borne platforms – Classification of satellites – Sun synchronous and Geosynchronous satellites – Lagrange Orbit.

UNIT IV SENSING TECHNIQUES 9

Classification of remote sensors – Resolution concept : spatial, spectral, radiometric and temporal resolutions - Scanners - Along and across track scanners – Optical-infrared sensors – Thermal sensors – microwave sensors – Calibration of sensors - High Resolution Sensors - LIDAR , UAV – Orbital and sensor characteristics of live Indian earth observation satellites

UNIT V DATA PRODUCTS AND INTERPRETATION 9

Photographic and digital products – Types, levels and open source satellite data products – selection and procurement of data – Visual interpretation: basic elements and interpretation keys - Digital interpretation – Concepts of Image rectification, Image enhancement and Image classification.

TOTAL: 45 PERIODS**COURSE OUTCOMES:** On completion of the course, the student is expected to be able to

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CO1 understand the concepts and laws related to remote sensing.

CO2 understand the interaction of electromagnetic radiation with atmosphere and earth material

CO3 acquire knowledge about satellite orbits and different types of satellites

CO4 understand the different types of remote sensors

CO5 gain knowledge about the concepts of interpretation of satellite imagery

TEXTBOOKS: 1. Thomas M.Lillesand, Ralph W. Kiefer and Jonathan W. Chipman, Remote Sensing and Image interpretation, John Wiley and Sons, Inc, New York,2015.

2. George Joseph and C Jeganathan, Fundamentals of Remote Sensing,Third Edition Universities Press (India) Private limited, Hyderabad, 2018

REFERENCES: 1. Janza, F.Z., Blue H.M. and Johnson,J.F. Manual of Remote Sensing. Vol.I, American Society of Photogrametry, Virginia, USA, 2002.

2. Verbyla, David, Satellite Remote Sensing of Natural Resources. CRC Press, 1995

3. Paul Curran P.J. Principles of Remote Sensing. Longman, RLBS, 1988.

4. Introduction to Physics and Techniques of Remote Sensing . Charles Elachi and Jacob Van Zyl, 2006 Edition II, Wiley Publication

5. Basudeb Bhatta, Remote Sensing and GIS, Oxford University Press, 2011 CRC Press, Taylor & Francis Group, London, UK, 2010



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OBJECTIVE

At the end of this course the student should have understood the problems associated with large heights of structures with respect to loads (wind and earthquake and deflections of the structure). He should know the rudimentary principles of designing tall buildings as per the existing course.

UNIT I INTRODUCTION

9

The Tall Building in the Urban Context - The Tall Building and its Support Structure - Development of High Rise Building Structures - General Planning Considerations. Dead Loads - Live Loads - Construction Loads - Snow, Rain, and Ice Loads - Wind Loads - Seismic Loading - Water and Earth Pressure Loads - Loads - Loads Due to Restrained Volume Changes of Material - Impact and Dynamic Loads - Blast Loads - Combination of Loads:

UNIT II THE VERTICAL STRUCTURE PLANE

9

Dispersion of Vertical Forces- Dispersion of Lateral Forces - Optimum Ground Level Space - Shear Wall Arrangement - Behaviour of Shear Walls under Lateral Loading- The Floor Structure or Horizontal Building Plane Floor Framing Systems- Horizontal Bracing- Composite Floor Systems The High - Rise Building as related to assemblage Kits Skeleton Frame Systems - Load Bearing Wall Panel Systems - Panel - Frame Systems - Multistory Box Systems.

UNIT III COMMON HIGH-RISE BUILDING STRUCTURES AND THEIR BEHAVIOUR UNDER LOAD

9

The Bearing Wall Structure- The Shear Core Structure - Rigid Frame Systems- The Wall - Beam Structure- Interspatial and Staggered Truss Systems - Frame - Shear Wall Building Systems - Flat Slab Building Structures - Shear Truss - Frame Interaction System with Rigid - Belt Trusses - Tubular Systems- Composite Buildings - Comparison of High - Rise Structural Systems Other Design Approaches Controlling Building Drift Efficient Building Forms - The Counteracting Force or Dynamic Response.

UNIT IV APPROXIMATE STRUCTURAL ANALYSIS AND DESIGN OF**BUILDINGS**

9

Approximate Analysis of Bearing Wall Buildings The Cross Wall Structure - The Long Wall Structure The Rigid Frame Structure Approximate Analysis for Vertical Loading - Approximate Analysis for Lateral Loading - Approximate Design of Rigid Frame Buildings- Lateral Deformation of Rigid Frame Buildings The Rigid Frame - Shear Wall Structure - The Vierendeel Structure - The Hollow Tube Structure.



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UNIT V OTHER HIGH-RISE BUILDING STRUCTURE

9

Deep - Beam Systems - High-Rise Suspension Systems - Pneumatic High -Rise Buildings -
Space Frame Applied to High - Rise Buildings - Capsule Architecture.

TOTAL: 45 PERIODS

TEXT BOOKS

1. WOLFGANG SCHUELLER " High - rise building Structures", John Wiley and Sons, New York 1976.
2. Bryan Stafford Smith and Alex Coull, " Tall Building Structures ", Analysis and Design, John Wiley and Sons, Inc., 1991.

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1. COULL, A. and SMITH, STAFFORD, B. " Tall Buildings "; Pergamon Press, London, 1997.
2. Lin T.Y. and Barry D.Stotes. " Structural Concepts and Systems for Architects and Engineers ", John Wiley, 1994.
3. Lynn S.Beedle, Advances in Tall Buildings, CBS Publishers and Distributors, Delhi, 1996.
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COURSE OBJECTIVE: To design different types of machine foundations based on the dynamic properties of soils and to get an exposure on vibration isolation techniques.

UNIT I THEORY OF VIBRATION 9

Introduction – Nature of dynamic loads – Basic definitions – Simple harmonic motion – Fundamentals of vibration – Single degree and multi degree of freedom systems – Free vibrations of spring – Mass systems – Forced vibrations – Resonance – Viscous damping – Principles of vibrations measuring systems – Effect of transient and pulsating loads.

UNIT II DYNAMIC SOIL PROPERTIES 9

Dynamic stress-strain characteristics – Principles of measuring dynamic properties – Laboratory techniques – Field tests – Block vibration test – Factors affecting dynamic properties – Typical values. Mechanism of liquefaction – Influencing factors – Evaluation of liquefaction potential – Analysis from SPT test – Dynamic bearing capacity – Dynamic earth pressure.

UNIT III MACHINE FOUNDATIONS 9

Introduction – Types of machine foundations – General requirements for design of machine foundations – Design approach for machine foundation – Vibration analysis – Elastic Half-Space theory – Mass-spring-dashpot model – Permissible amplitudes – Permissible bearing pressures.

UNIT IV DESIGN OF MACHINE FOUNDATION 9

Evaluation of design parameters – Types of Machines and foundations – General requirements – their importance – Analysis and design of block type and framed type machine foundations – Modes 135 of vibration of a rigid foundation – Foundations for reciprocating machines, impact machines, Two – Cylinder vertical compressor, Double-acting steam hammer – Code recommendations – Empirical approach – Barken's method – Bulb of pressure concept – Pauw's analogy – Vibration table studies.

UNIT V VIBRATION ISOLATION 9

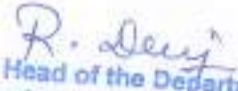
Vibration isolation – Types of isolation – Transmissibility – Passive and active isolation – Methods of isolation – Use of springs and damping materials – Properties of isolating materials – Vibration control of existing machine foundation.


TOTAL:45 PERIODS

COURSE OUTCOMES: On completion of the course, the student is expected to be able to;

CO1 Acquire knowledge to apply theories of vibration to solve dynamic soil problems.

CO2 Evaluate the dynamic properties of soil using laboratory and field tests.


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CO3 Acquire basic knowledge about machine foundations and design various types of machine foundation.


CO4 To know and capable of selecting the types of vibration isolation materials.

CO5 To apply vibration isolation techniques for various field problems.

REFERENCES:

1. KameswaraRao, N.S.V., Dynamics soil tests and applications, Wheeler Publishing, New Delhi, 2000.
2. Prakash, S and Puri, V.K., Foundations for machines, McGraw Hill, 1987.
3. Moore, P.J., Analysis and Design of Foundations for Vibrations, Oxford and IBH, 1985.
4. Vaidyanathan, C.V., and Srinivasulu, P., Handbook of Machine Foundations, McGraw Hill, 1995.
5. Arya, S., O'Neil: S., Design of Structures and Foundations for Vibrating Machines, Prentice Hall, 1981.
6. Major, A., Vibration Analysis and Design of Foundations for Machines and Turbines, Vol. I, II and III Budapest, 1964.
7. Barkan, D.D., Dynamics of Basis of Foundation, McGraw Hill, 1974.
8. Swami Saram, Soil Dynamics and Machine Foundation, Galgotia publications Pvt. Ltd. New Delhi 2010.
9. Das B.M., Principles of Soil Dynamics, McGraw Hill, 1992.
10. Kramer S.L., Geotechnical Earthquake Engineering, Prentice Hall, International series, Pearson Education (Singapore) Pvt Ltd, 2004.
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ROCK ENGINEERING

L T P C

3 0 0 3

COURSE OBJECTIVES: Students are expected to classify, understand stress-strain characteristics, failure criteria, and influence of in-situ stress in the stability of various structures and various technique to improve the in-situ strength of rocks.

UNIT I CLASSIFICATION OF ROCKS 9

Types of Rocks - Index properties and classification of rock masses, competent and incompetent rock - value of RMR and ratings in field estimations.

UNIT II STRENGTH CRITERIA OF ROCKS 9

Behaviour of rock under hydrostatic compression and deviatric loading - Modes of rock failure planes of weakness and joint characteristics - joint testing, Mohr - Coulomb failure criterion and tension cutoff. Hock and Brown Strength criteria for rocks with discontinuity sets.

UNIT III INSITU STRESSES IN ROCKS 9

In-situ stresses and their measurements, Hydraulic fracturing, flat jack, over coring and under coring methods - stress around underground excavations - Design aspects of openings in rocks.

UNIT IV SLOPE STABILITY AND BEARING CAPACITY OF ROCKS 9

Rock slopes - role of discontinuities in slip failure, slope analysis and factor of safety - remedial measures for critical slopes - Bearing capacity of foundations on rocks.

UNIT V ROCK STABILIZATION 9


Stabilization of rocks-rock support and rock reinforcement-active and passive supports-ground response curve-support reaction curve-reinforcement of fractured and jointed rocks-Shotcreting bolting-anchoring-installation methods.

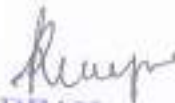
TOTAL: 45 PERIODS

COURSE OUTCOMES: On completion of the course, the student is expected to be able to

CO1 Classify the Rock mass and rate the quality of rock for tunnelling and foundations works and suggest the safer length of tunnelling and stand-up time.

CU2 Apply the knowledge of engineering and understand the stress - strain characteristics and failure criteria of rock and apply them to arrive at the shear strength parameters of rocks to be used for the design of structures resting on rock and also for the design of underground excavation in rocks.


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CO3 Apply the knowledge of engineering and assess the influence of in-situ stress in the stability of various underground excavations and also acquire the knowledge of design of opening in rocks.


CO4 Apply the knowledge on rock mechanics and analyze the stability of rock slopes and arrive at the bearing capacity of shallow and deep foundations resting on rocks considering the presence of joints. design the foundations resting on rocks. Able to carry-out suitable foundation for the structure resting on rock.

CO5 Improve the in-situ strength of rocks by various methods such as rock reinforcement and rock support. Able to select suitable support system considering the interaction between rock and support. Also capable of executing the same in the field.

REFERENCES:

1. Goodman, R.E., Introduction to rock mechanics, John Willey and Sons, 1989.
2. Hudson, A. and Harrison, P., Engineering Rock mechanics – An introduction to the principles, Pergamon publications, 1997.
3. Hoek, E and Bray, J., Rock slope Engineering, Institute of Mining and Metallurgy, U.K. 1981.
4. Hoek, E and Brown, E.T., Underground Excavations in Rock, Institute of Mining and Metallurgy, U.K. 1981.
5. Obvert, L. and Duvall, W., Rock Mechanics and the Design of structures in Rock. John Wiley, 1967.
6. Bazant, Z.P., Mechanics of Geomaterials Rocks, Concrete and Soil, John Wiley and Sons, Chichester, 1985. Wittke, W., Rock Mechanics, Theory and Applications with case Histories, Springer-Verlag, Berlin, 1990.
7. Waltham, T., Foundations of Engineering Geology, Second Edition, Spon Press, Taylor & Francis Group, London and New York, 2002.
8. Ramamurthy T., "Engineering in Rocks for Slopes Foundations and Tunnels", PHI Learning Pvt. Ltd., 2007


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22255E33B

DESIGN OF BRIDGES

L T P C

3 0 0 3

OBJECTIVE: To study the loads, forces on bridges and design principles of several types of bridges.

UNIT I INTRODUCTION

9

Introduction-Selection of Site and Initial Decision Process - Classification of Bridges- General Features of Design- Standard Loading for Bridge Design as per different codes - Road Bridges - Railway Bridges - Design Codes - Working Stress Method- Limit State Method of Design

UNIT II SUPERSTRUCTURES

9

Selection of main bridge parameters, design methodologies -Choices of superstructure types - Orthotropic plate theory, load distribution techniques - Grillage analysis - Finite element analysis Different types of superstructure (RCC and PSC); Longitudinal Analysis of Bridge - Transverse Analysis of Bridge

UNIT III BRIDGE DESIGN PRINCIPLES

9

Analysis and Design of RCC solid slab culverts -Design of RCC Tee beam and slab bridges - Design principles of continuous girder bridges, box girder bridges, balanced cantilever bridges - Arch bridges - Box culverts - Segmental bridges -Design principles only

UNIT IV SUBSTRUCTURE, BEARINGS AND DECK JOINTS

9

Design of bridge bearings and substructure

UNIT V PRESTRESSED CONCRETE BRIDGES & STEEL BRIDGES

9

Design principles of PSC bridges - PSC girders - Design principles of steel bridges - Plate girder bridges - Box girder bridges - Truss bridges - Vertical and Horizontal stiffeners.

TOTAL: 45 PERIODS

OUTCOMES: On completion of this course, student will be able to

CO1 Explain the different types of bridges and design philosophies

CO2 Design an RC solid slab culvert bridge


CO3 Design an RC Tee Beam and Slab bridge

CO4 Design the bridge bearings and substructure

CO5 Explain the design principles of PSC bridges, box girder bridges, truss bridges


REFERENCES:

1. Jagadeesh, T.R. and Jayaram, M.A., "Design of Bridge Structures", Second Edition, Prentice Hall of India Pvt. Ltd. 2009.

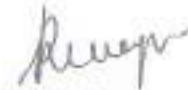

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2. Johnson Victor, D. "Essentials of Bridge Engineering", Sixth Edition, Oxford and IBH Publishing Co. New Delhi, 2019.
3. Ponnuswamy, S., "Bridge Engineering", Third Edition, Tata McGraw Hill, 2017.
4. Raina V.K." Concrete Bridge Practice" Tata McGraw Hill Publishing Company, New Delhi, 2014.
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COURSE OBJECTIVES: To introduce students to various components and design of water supply scheme, water treatment methods, water storage distribution system, sewage treatment and disposal and design of intake structures and sewerage system.

UNIT I WATER SUPPLY

12

Estimation of surface and subsurface water resources - Predicting demand for water- Impurities of water and their significance - Physical, chemical and bacteriological analysis - Waterborne diseases - Standards for potable water. Intake of water: Pumping and gravity schemes.

UNIT II WATER TREATMENT

12

Objectives - Unit operations and processes - Principles, functions, and design of water treatment plant units, aerators of flash mixers, Coagulation and flocculation - Clariflocculator - Plate and tube settlers - Pulsator clarifier - sand filters - Disinfection - softening, removal of iron and manganese - Defluoridation - Softening - Desalination process - Residue Management - Construction, Operation and Maintenance aspects

UNIT III WATER STORAGE AND DISTRIBUTION

12

Storage and balancing reservoirs - types, location and capacity. Distribution systems: layout, hydraulics of pipe lines, pipe fittings, valves including check and pressure reducing valves, meters, analysis of distribution systems, leak detection, maintenance of distribution systems, pumping stations and their operations - House service connections.

UNIT IV PLANNING AND DESIGN OF SEWERAGE SYSTEM

12

Characteristics and composition of sewage - Population equivalent - Sanitary sewage flow estimation - Sewer materials - Hydraulics of flow in sanitary sewers - Sewer design - Storm drainage-Storm runoff estimation - Sewer appurtenances - Corrosion in sewers - Prevention and control - Sewage pumping-drainage in buildings - Plumbing systems for drainage

UNIT V SEWAGE TREATMENT AND DISPOSAL

12

Objectives - Selection of Treatment Methods - Principles, Functions, - Activated Sludge Process and Extended aeration systems - Trickling filters - Sequencing Batch Reactor(SBR) - UASB - Waste Stabilization Ponds - Other treatment methods - Reclamation and Reuse of sewage - Recent Advances in Sewage Treatment - Construction, Operation and Maintenance aspects. - Discharge standards-sludge treatment -Disposal of sludge

TOTAL: 60 PERIODS


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COURSE OUTCOMES: On completion of the course, the student is expected to

CO1 Understand the various components of water supply scheme and design of intake structure and conveyance system for water transmission

CO2 Understand on the characteristics and composition of sewage, ability to estimate sewage generation and design sewer system including sewage pumping stations

CO3 Understand the process of conventional treatment and design of water and wastewater treatment system and gain knowledge of selection of treatment process and biological treatment process

CO4 Ability to design and evaluate water distribution system and water supply in buildings and understand the self-purification of streams and sludge and septage disposal methods.

CO5 Able to understand and design the various advanced treatment system and knowledge about the recent advances in water and wastewater treatment process and reuse of sewage

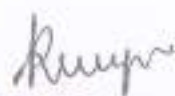
TEXTBOOKS:

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2. Modi, P.N., Water Supply Engineering, Vol.I Standard Book House, New Delhi, 2016.
3. Garg, S.K., Environmental Engineering Vol.II, Khanna Publishers, New Delhi, 2015.
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5. Punmia, B.C., Jain, A.K., and Jain.A.K., Environmental Engineering, Vol.II, Laxmi Publications, 2010.

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1. Punmia B.C, Ashok Jain and Arun Jain, Water Supply Engineering, Laxmi Publications (P) Ltd., New Delhi 2010.
2. Manual on Water Supply and Treatment, CPHEEO, Ministry of Urban Development, Government of India, New Delhi, 1999.
3. Syed R. Qasim and Edward M. Motley Guang Zhu, Water Works Engineering Planning, Design and Operation, Prentice Hall of India Learning Private Limited, New Delhi, 2009.
4. Of Urban Development, Government of India, New Delhi, 2013.
5. Metcalf and Eddy – Waste water Engineering – Treatment and Reuse, Tata Mc. Graw – Hill Company, New Delhi, 2010.


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OBJECTIVE:

To study the concept of soil-structure – interaction in the analysis and design of structures.

UNIT I SOIL-FOUNDATION INTERACTION 9

Introduction to soil-foundation interaction problems – Soil behaviour – Foundation behaviour Interface behaviour- Scope of soil foundation interaction analysis- soil response models–Elastic continuum- Two parameter elastic models- Elastic-plastic behaviour- Time dependent behaviour.

UNIT II BEAM ON ELASTIC FOUNDATION- SOIL MODELS 9

Infinite beam – Two-parameters models – Isotropic elastic half space model – Analysis of beams of finite length – combined footings.

UNIT III PLATES ON ELASTIC CONTINUUM 9

Thin and thick rafts – Analysis of finite plates - Numerical analysis of finite plates.

UNIT IV ANALYSIS OF AXIALLY AND LATERALLY LOADED PILES AND PILE GROUPS 9

Elastic analysis of single pile – Theoretical solutions for settlement and load distributions Analysis of pile group – Interaction analysis – Load distribution in groups with rigid cap – Load deflection prediction for laterally loaded piles – Subgrade reaction and elastic analysis – Interaction analysis – Pile-raft system.

UNIT V GROUND-FOUNDATION-STRUCTURE INTERACTION 9


Effect of structure on ground-foundation interaction – Static and dynamic loads- Contact pressure and its estimation – Estimation of the settlement from the constitutive laws – Free-field response – Kinetic interaction – Inertial interaction

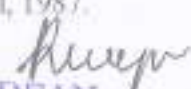
TOTAL: 45 PERIODS

OUTCOMES: On completion of the course, the student is expected to be able to

- CO1 Explain the concept of soil structure interaction.
- CO2 Do a static analysis of infinite and finite beams resting on elastic foundation
- CO3 Analyse finite thin and thick plates
- CO4 Do a static and dynamic analysis of soil structure interaction problems
- CO5 Analyze ground foundation and structure interaction problems.

REFERENCES: 1. John P. Wolf, (1985) Soil-structure interaction, Prentice Hall, 1987.


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2. Bowels, J.E., "Analytical and Computer methods in Foundation" McGraw Hill Book Co., New York, 1974

3. Desai C.S. and Christian J.T., "Numerical Methods in Geotechnical Engineering" McGraw Hill Book Co. New York, 1977.

4. Soil Structure Interaction, the real behaviour of structures, Institution of Structural Engineers, 1989.


5. A.P.S. Selvadurai, Elastic Analysis of Soil Foundation Interaction, Developments in Geotechnical Engg.vol-17, Elsevier Scientific Publishing Co., 1979.

6. Prakash, S., and Sharma, H. D., "Pile Foundations in Engineering Practice," John Wiley & Sons, New York, 1990.

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COURSE OBJECTIVES:

- To introduce the concepts of remote sensing processes and its components.
- To expose the various remote sensing platforms and sensors and to introduce the elements of data interpretation.

UNIT I REMOTE SENSING AND ELECTROMAGNETIC RADIATION 9

Definition – components of RS – History of Remote Sensing – Merits and demerits of data collation between conventional and remote sensing methods - Electromagnetic Spectrum – Radiation principles - Wave theory, Planck's law, Wien's Displacement Law, Stefan's Boltzmann law, Kirchoff's law – Radiation sources: active & passive - Radiation Quantities

UNIT II EMR INTERACTION WITH ATMOSPHERE AND EARTH MATERIAL 9

Standard atmospheric profile – main atmospheric regions and its characteristics – interaction of radiation with atmosphere – Scattering, absorption and refraction – Atmospheric windows - Energy balance equation – Specular and diffuse reflectors – Spectral reflectance & emittance – Spectroradiometer – Spectral Signature concepts – Typical spectral reflectance curves for vegetation, soil and water – solid surface scattering in microwave region.

UNIT III ORBITS AND PLATFORMS 9

Motions of planets and satellites – Newton's law of gravitation - Gravitational field and potential – Escape velocity - Kepler's law of planetary motion - Orbit elements and types – Orbital perturbations and maneuvers – Types of remote sensing platforms - Ground based, Airborne platforms and Space borne platforms – Classification of satellites – Sun synchronous and Geosynchronous satellites – Lagrange Orbit.

UNIT IV SENSING TECHNIQUES 9

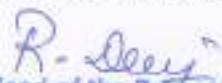
Classification of remote sensors – Resolution concept : spatial, spectral, radiometric and temporal resolutions - Scanners - Along and across track scanners – Optical-infrared sensors – Thermal sensors – microwave sensors – Calibration of sensors - High Resolution Sensors - LIDAR, UAV – Orbital and sensor characteristics of live Indian earth observation satellites

UNIT V DATA PRODUCTS AND INTERPRETATION 9

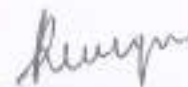
Photographic and digital products – Types, levels and open source satellite data products – selection and procurement of data– Visual interpretation: basic elements and interpretation keys - Digital interpretation – Concepts of Image rectification, Image enhancement and Image classification.

TOTAL: 45 PERIODS**COURSE OUTCOMES:** On completion of the course, the student is expected to be able to

CO1 understand the concepts and laws related to remote sensing



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CO2 understand the interaction of electromagnetic radiation with atmosphere and earth material

CO3 acquire knowledge about satellite orbits and different types of satellites

CO4 understand the different types of remote sensors

CO5 gain knowledge about the concepts of interpretation of satellite imagery

TEXTBOOKS: 1. Thomas M.Lillesand, Ralph W. Kiefer and Jonathan W. Chipman, Remote Sensing and Image interpretation, John Wiley and Sons, Inc, New York, 2015.

2. George Joseph and C.Jeganathan, Fundamentals of Remote Sensing, Third Edition Universities Press (India) Private limited, Hyderabad, 2018


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2. Verbyla, David, Satellite Remote Sensing of Natural Resources. CRC Press, 1995

3. Paul Curran P.J. Principles of Remote Sensing. Longman, RLBS, 1988.

4. Introduction to Physics and Techniques of Remote Sensing , Charles Elachi and Jacob Van Zyl, 2006 Edition II, Wiley Publication.

5. Basudeb Bhatta, Remote Sensing and GIS, Oxford University Press, 2011 CRC Press, Taylor & Francis Group, London, UK, 2010


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OBJECTIVE

At the end of this course the student should have understood the problems associated with large heights of structures with respect to loads (wind and earthquake and deflections of the structure). He should know the rudimentary principles of designing tall buildings as per the existing course.

UNIT I INTRODUCTION

9

The Tall Building in the Urban Context - The Tall Building and its Support Structure - Development of High Rise Building Structures - General Planning Considerations. Dead Loads - Live Loads - Construction Loads - Snow, Rain, and Ice Loads - Wind Loads - Seismic Loading - Water and Earth Pressure Loads - Loads - Loads Due to Restrained Volume Changes of Material - Impact and Dynamic Loads - Blast Loads - Combination of Loads.

UNIT II THE VERTICAL STRUCTURE PLANE

9

Dispersion of Vertical Forces - Dispersion of Lateral Forces - Optimum Ground Level Space - Shear Wall Arrangement - Behaviour of Shear Walls under Lateral Loading. The Floor Structure or Horizontal Building Plane Floor Framing Systems - Horizontal Bracing - Composite Floor Systems The High - Rise Building as related to assemblage Kits Skeleton Frame Systems - Load Bearing Wall Panel Systems - Panel - Frame Systems - Multistory Box Systems.

UNIT III COMMON HIGH-RISE BUILDING STRUCTURES AND THEIR BEHAVIOUR UNDER LOAD

9

The Bearing Wall Structure - The Shear Core Structure - Rigid Frame Systems - The Wall - Beam Structure: Interspatial and Staggered Truss Systems - Frame - Shear Wall Building Systems - Flat Slab Building Structures - Shear Truss - Frame Interaction System with Rigid - Belt Trusses - Tubular Systems - Composite Buildings - Comparison of High - Rise Structural Systems Other Design Approaches Controlling Building Drift Efficient Building Forms - The Counteracting Force or Dynamic Response.

UNIT IV APPROXIMATE STRUCTURAL ANALYSIS AND DESIGN OF**BUILDINGS**

9

Approximate Analysis of Bearing Wall Buildings The Cross Wall Structure - The Long Wall Structure The Rigid Frame Structure Approximate Analysis for Vertical Loading - Approximate Analysis for Lateral Loading - Approximate Design of Rigid Frame Buildings - Lateral Deformation of Rigid Frame Buildings The Rigid Frame - Shear Wall Structure - The Vierendeel Structure - The Hollow Tube Structure.

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UNIT V OTHER HIGH-RISE BUILDING STRUCTURE

9

Deep - Beam Systems -High-Rise Suspension Systems - Pneumatic High -Rise Buildings -
Space Frame Applied to High - Rise Buildings - Capsule Architecture.

TOTAL: 45 PERIODS

TEXT BOOKS


1. WOLFGANG SCHUELLER " High - rise building Structures", John Wiley and Sons, New York 1976.
2. Bryan Stafford Smith and Alex Coull, " Tall Building Structures ", Analysis and Design, John Wiley and Sons, Inc., 1991.

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1. COULL, A. and SMITH, STAFFORD, B. " Tall Buildings ", Pergamon Press, London, 1997.
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COURSE OBJECTIVE: To design different types of machine foundations based on the dynamic properties of soils and to get an exposure on vibration isolation techniques.

UNIT I THEORY OF VIBRATION

9

Introduction – Nature of dynamic loads – Basic definitions – Simple harmonic motion – Fundamentals of vibration – Single degree and multi degree of freedom systems – Free vibrations of spring – Mass systems – Forced vibrations – Resonance – Viscous damping – Principles of vibrations measuring systems – Effect of transient and pulsating loads.

UNIT II DYNAMIC SOIL PROPERTIES

9

Dynamic stress-strain characteristics – Principles of measuring dynamic properties – Laboratory techniques – Field tests – Block vibration test – Factors affecting dynamic properties – Typical values. Mechanism of liquefaction – Influencing factors – Evaluation of liquefaction potential – Analysis from SPT test – Dynamic bearing capacity – Dynamic earth pressure.

UNIT III MACHINE FOUNDATIONS

9

Introduction – Types of machine foundations – General requirements for design of machine foundations – Design approach for machine foundation – Vibration analysis – Elastic Half-Space theory – Mass-spring-dashpot model – Permissible amplitudes – Permissible bearing pressures.

UNIT IV DESIGN OF MACHINE FOUNDATION

9

Evaluation of design parameters – Types of Machines and foundations – General requirements their importance – Analysis and design of block type and framed type machine foundations – Modes 135 of vibration of a rigid foundation – Foundations for reciprocating machines, impact machines, Two – Cylinder vertical compressor, Double-acting steam hammer – Code recommendations – Empirical approach – Barken's method – Bulb of pressure concept – Pauw's analogy – Vibration table studies.

UNIT V VIBRATION ISOLATION

9

Vibration isolation – Types of isolation – Transmissibility – Passive and active isolation – Methods of isolation – Use of springs and damping materials – Properties of isolating materials – Vibration control of existing machine foundation.

TOTAL:45 PERIODS

COURSE OUTCOMES: On completion of the course, the student is expected to be able to;

CO1 Acquire knowledge to apply theories of vibration to solve dynamic soil problems.

CO2 Evaluate the dynamic properties of soil using laboratory and field tests.

CO3 Acquire basic knowledge about machine foundations and design various types of machine foundation.


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CO4 To know and capable of selecting the types of vibration isolation materials.

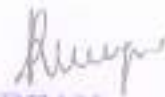
CO5 To apply vibration isolation techniques for various field problems.

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1. KameswaraRao, N.S.V., Dynamics soil tests and applications, Wheeler Publishing, New Delhi, 2000.
2. Prakash, S and Puri, V.K., Foundations for machines, McGraw Hill, 1987.
3. Moore, P.J., Analysis and Design of Foundations for Vibrations, Oxford and IBH, 1985.
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5. Arya, S., O'Neil; S., Design of Structures and Foundations for Vibrating Machines, Prentice Hall, 1981.
6. Major, A., Vibration Analysis and Design of Foundations for Machines and Turbines, Vol. I, II and III Budapest, 1964.
7. Barkan, D.D., Dynamics of Basis of Foundation, McGraw Hill, 1974.
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ROCK ENGINEERING

L T P C

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COURSE OBJECTIVES: Students are expected to classify, understand stress-strain characteristics, failure criteria, and influence of in-situ stress in the stability of various structures and various technique to improve the in-situ strength of rocks.

UNIT I CLASSIFICATION OF ROCKS

9

Types of Rocks - Index properties and classification of rock masses, competent and incompetent rock - value of RMR and ratings in field estimations.

UNIT II STRENGTH CRITERIA OF ROCKS

9

Behaviour of rock under hydrostatic compression and deviatoric loading - Modes of rock failure planes of weakness and joint characteristics - joint testing, Mohr - Coulomb failure criterion and tension cutoff. Hoek and Brown Strength criteria for rocks with discontinuity sets.

UNIT III INSITU STRESSES IN ROCKS

9

In-situ stresses and their measurements, Hydraulic fracturing, flat jack, over coring and under coring methods - stress around underground excavations - Design aspects of openings in rocks.

UNIT IV SLOPE STABILITY AND BEARING CAPACITY OF ROCKS

9

Rock slopes - role of discontinuities in slope failure, slope analysis and factor of safety - remedial measures for critical slopes - Bearing capacity of foundations on rocks.

UNIT V ROCK STABILIZATION

9

Stabilization of rocks-rock support and rock reinforcement-active and passive supports-ground response curve-support reaction curve-reinforcement of fractured and jointed rocks-Shotcreting bolting-anchoring-installation methods.

TOTAL: 45 PERIODS

COURSE OUTCOMES: On completion of the course, the student is expected to be able to

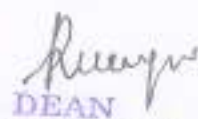
CO1 Classify the Rock mass and rate the quality of rock for tunnelling and foundations works and suggest the safer length of tunnelling and stand-up time.

CO2 Apply the knowledge of engineering and understand the stress - strain characteristics and failure criteria of rock and apply them to arrive at the shear strength parameters of rocks to be used for the design of structures resting on rock and also for the design of underground excavation in rocks.

CO3 Apply the knowledge of engineering and assess the influence of in-situ stress in the stability of various underground excavations and also acquire the knowledge of design of opening in rocks.



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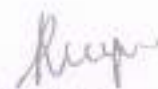
CO4 Apply the knowledge on rock mechanics and analyze the stability of rock slopes and arrive at the bearing capacity of shallow and deep foundations resting on rocks considering the presence of joints. design the foundations resting on rocks. Able to carry-out suitable foundation for the structure resting on rock.

CO5 Improve the in-situ strength of rocks by various methods such as rock reinforcement and rock support. Able to select suitable support system considering the interaction between rock and support. Also capable of executing the same in the field.

REFERENCES:

1. Goodman, R.E., Introduction to rock mechanics, John Willey and Sons, 1989.
2. Hudson, A. and Harrison, P., Engineering Rock mechanics – An introduction to the principles, Pergamon publications, 1997.
3. Hoek, E and Bray, J., Rock slope Engineering, Institute of Mining and Metallurgy, U.K. 1981.
4. Hoek, E and Brown, E.T., Underground Excavations in Rock, Institute of Mining and Metallurgy, U.K. 1981.
5. Obvert, L. and Duvall, W., Rock Méchanics and the Design of structures in Rock, John Wiley, 1967.
6. Bazant, Z.P., Mechanics of Geomaterials Rocks, Concrete and Soil, John Wiley and Sons, Chichester, 1985 Wittke, W., Rock Mechanics, Theory and Applications with case Histories, Springerverlag, Berlin, 1990.
7. Waltham, T, Foundations of Engineering Geology, Second Edition, Span Press, Taylor & Francis Group, London and New York, 2002.
8. Ramamurthy T., "Engineering in Rocks for Slopes Foundations and Tunnels", PHI Learning Pvt. Ltd., 2007


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OBJECTIVE: To study the loads, forces on bridges and design principles of several types of bridges.

UNIT I INTRODUCTION

9

Introduction-Selection of Site and Initial Decision Process - Classification of Bridges- General Features of Design- Standard Loading for Bridge Design as per different codes - Road Bridges – Railway Bridges - Design Codes - Working Stress Method- Limit State Method of Design

UNIT II SUPERSTRUCTURES

9

Selection of main bridge parameters, design methodologies -Choices of superstructure types - Orthotropic plate theory, load distribution techniques - Grillage analysis - Finite element analysis - Different types of superstructure (RCC and PSC); Longitudinal Analysis of Bridge - Transverse Analysis of Bridge

UNIT III BRIDGE DESIGN PRINCIPLES

9

Analysis and Design of RCC solid slab culverts -Design of RCC Tee beam and slab bridges - Design principles of continuous girder bridges, box girder bridges, balanced cantilever bridges – Arch bridges – Box culverts – Segmental bridges-Design principles only

UNIT IV SUBSTRUCTURE, BEARINGS AND DECK JOINTS

9

Design of bridge bearings and substructure.

UNIT V PRESTRESSED CONCRETE BRIDGES & STEEL BRIDGES

9

Design principles of PSC bridges – PSC girders -Design principles of steel bridges - Plate girder bridges – Box girder bridges – Truss bridges – Vertical and Horizontal stiffeners.

TOTAL: 45 PERIODS

OUTCOMES: On completion of this course, student will be able to

CO1 Explain the different types of bridges and design philosophies

CO2 Design an RC solid slab culvert bridge

CO3 Design an RC Tee Beam and Slab bridge

CO4 Design the bridge bearings and substructure

CO5 Explain the design principles of PSC bridges, box girder bridges, truss bridges

REFERENCES:

1. Jagadeesh. T.R. and Jayaram, M.A., "Design of Bridge Structures", Second Edition, Prentice Hall of India Pvt. Ltd. 2009.

2. Johnson Victor, D. "Essentials of Bridge Engineering", Sixth Edition, Oxford and IBH Publishing Co. New Delhi, 2019.

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3. Ponnuswamy, S., "Bridge Engineering", Third Edition, Tata McGraw Hill, 2017.
4. Raina V.K. "Concrete Bridge Practice" Tata McGraw Hill Publishing Company, New Delhi, 2014.
5. Design of Highway Bridges, Richard M. Barker & Jay A. Puckett. John Wiley & Sons, Inc., 2021


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**ANNEXURE II
VALUE ADDED COURSES**

LANDSCAPE ARCHITECTURE

S.NO	TOPICS	MINIMUM
1.	Introduction to Landscape.	5 hrs
2.	Categories and Materials in Landscape.	5 hrs
3.	Objective and Professional Scope of Landscape Design.	5 hrs
4.	Introduction to History of Landscape Design	5 hrs
5.	Behavioral Principle.	5 hrs
6.	Landform Design.	5 hrs
7.	Planting Design.	5 hrs
8.	Assess Landscape Sites.	5 hrs
9.	Prepare Estimates, Quotes and Tenders.	5 hrs.

Duration of the Course: 45 hours.

Learning outcomes:

1. Identify appropriate methods of design inquiry and problem solving processes to produce creative solutions to identified problems and questions.
2. Identify, collect, and analyze necessary information using appropriate technologies and analytical techniques as they relate to the identified problem or question.
3. Explore and critically analyze alternative design or planning solutions to the identified problem or question.
4. Engage in assessment and evaluation practices throughout the entire design process.

ETABS

S.No	Topics	Minimum
1.	Introduction.	5hrs
2.	Installing Etabs.(Modeling Features, Analysis Features, Design Features, Detailing Features.)	5hrs
3.	The Etabs System.(Overview of the Modeling Process. Properties.)	5hrs
4.	ETABS Modeling Techniques.	5hrs
5.	Live Load Reduction.	5hrs
6.	Section Designer.	5hrs
7.	ETABS Analysis Techniques.	5hrs
8.	Linear Time History Analysis.	5hrs
9.	Buckling Analysis.	5hrs

Duration of the Course: 45 hours

Learning outcomes:

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8.	Extract data from a single source of truth: Drawings, Reports, Model, Production Data, Other software.	5 hrs
9.	Automated Structural Analysis And Design.	5 hrs

Duration of the Course: 45 hours.

Learning outcomes:

1. Tekla Structures is a software used in the construction industry to create and manage 3D models of concrete and steel structures. Users can learn to create models, analyze and design them.
2. The software enables users to create and manage 3D structural models in concrete or steel, and guides them through the process from concept to fabrication.
3. Tekla Structures empowers engineers to create highly detailed, accurate 3D models of structures, ensuring precision in design and construction. This precision minimizes errors and rework, ultimately saving time and resources.

SKETCHUP

S.NO	TOPICS	MINIMUM
1.	Introduction For Sketchup.	5 hrs
2.	Modeling of Entities.	5 hrs
3.	Components & Groups.	5 hrs
4.	Interior Designer, Landscape Designer, Sketchup 3D Design Specialist.	5 hrs
5.	Modeling From Dwg, Model Visualization, model Documentation, Organic Design.	5 hrs
6.	Urban Design, Environment Modeling, Landscape Design.	5 hrs
7.	Architectural Designer, Space Illustrator, Sketchup Artist.	5 hrs
8.	Presenting Your Model.	5 hrs
9.	3D Model to 2D Documentation.	5 hrs

Duration of the Course: 45 hours

Learning outcomes:

1. Learn about how to use different type of SketchUp tools and option settings from absolute beginner level.
2. Learn how to manipulate different type of essential tools and options at beginner level in SketchUp.
3. Learn how to use certain Sketchup Plugins to take your modeling skills to the next level.

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1. **Modeling:** How to create models in less time and interpret the results while working with the physical member based objects.
2. **Concrete Frame Design & Detailing:** Applicable to line objects and the program determines the appropriate design procedure when the analysis is run.
3. **Steel Frame Design & Detailing:** How to detail steel member selection, drift optimization and stress checking processes using various design code algorithms.
4. **Steel Connection Design:** Design of steel connections is seamlessly integrated into the program.
5. **Composite Beam:** To composite beams for determining their sizes for analysis, auto select-section property can be defined.

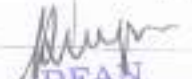
DEMOLITION ENGINEERING

S.NO	TOPICS	MINIMUM
1.	Bridge Demolition Engineering.	5 hrs
2.	Manuals and Specifications for Demolition.	5 hrs
3.	Equipment and tools for Bridge Demolition.	5 hrs
4.	Demolition with Explosives.	5 hrs
5.	Understand the Application of Case Studies in Demolition.	5 hrs
6.	Excavations: Hazard Recognition in Trenching and shoring.	5 hrs
7.	Analyze the different safety practices involved in demolition construction.	5 hrs
8.	Develop a supplemental Demolition plan based on a job-site visit.	5 hrs
9.	Evaluate and discuss the benefits of Obtaining Knowledge On Demolition.	5 hrs

TEKLA STRUCTURES

S.NO	TOPICS	MINIMUM
1.	Open the Software and Choose Appropriate Roles and Configurations.	5 hrs
2.	Open and Navigate in a model.	5 hrs
3.	Identify and use Basic commands on the Ribbon, side pane and file menu.	5 hrs
4.	Find the information you need for a particular task with the help OF selection switches, tooltips and instructor pane.	5 hrs
5.	Visualize information and render it: 3D model, view filters and representation settings, visualizer.	5 hrs
6.	Define parameters connected to modeled objects.	5 hrs
7.	Create and manage General arrangement and fabrication drawings.	5 hrs


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