

ACADEMIC YEAR
2019 – 2020



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ACADEMIC YEAR – 2019 - 2020

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SCHOOL OF ENGINEERING AND TECHNOLOGY
DEPARTMENT OF MECHANICAL ENGINEERING

Date: 10/04/2019

Minutes of the Board of Studies meeting for UG & PG in the Department of
Mechanical Engineering held on 10.04.2019 at 10:30 am.

Members Present (Internal & External):

S.No	Name of the Member	Designation	Role
1	Dr. S. Dhanushkodi	Professor	Chairperson
2	Dr.T.Madhusudhan	Professor, SJB Institute of Technology Bengaluru.	External Member
3	Mr.A.Leelavinothan	Addl.GM / BHEL, Trichy	External Member
4	Dr.S.Devi	DEAN	Invited Member
5	Dr.T.V.Christy	Professor	Internal Member
6	Dr.V.Yalini	Associate professor	Internal Member
7	Dr.S.Sukumar	Associate professor	Internal Member
8	Dr.Ttm.Kannan	Associate professor	Internal Member
9	M.Abdul Ghani Khan	Associate professor	Internal Member
10	R.Tamizh Selvan	Assistant Professor	Internal Member
11	P.Vijayakumar	Assistant Professor	Internal Member
12	R.Baskaran	Assistant Professor	Internal Member
13	K.Purushothaman	Assistant Professor	Internal Member
14	M.Sudhahar	Assistant Professor	Internal Member
15	P.Sarath Kumar	Assistant Professor	Internal Member
16	N.Sivaharinathan	Assistant Professor	Internal Member
17	J.Rajesh	Assistant Professor	Internal Member
18	G.Arunkumar	Assistant Professor	Internal Member
19	G.Brithiviraj	Assistant Professor	Internal Member
20	J.Selvamani	Assistant Professor	Internal Member

The Chairman, Board of Studies in the Department of Mechanical Engineering welcomed the Honorable members and briefed about the curriculum and syllabi.

The committee carefully reviewed the existing curriculum and syllabi (Regulation 2017) of UG (B.Tech [Mechanical Engineering]-FT & PT) and PG (M.Tech [Manufacturing Technology] -FT & PT) and scrutinized the feedbacks obtained from various stakeholders and recommended the following suggestions for the academic year 2019-2020 (Regulation 2019).

Inclusion of New Courses in B.Tech – Mechanical Engineering (FT) – (R-2019)

1. Safety in Engineering industries
2. General Aspects of Energy Management and Energy audit
3. Composite Materials
4. Energy Efficiency in Thermal Utilities
5. Renewable energy sources
6. Automotive Systems
7. Industrial Safety
8. Testing of materials
9. Programme Exit Examination
10. Fundamentals of Indian constitution and Economy

Change of Course Content in B.Tech – Mechanical Engineering (FT) – (R-2019)

1. Gas Dynamics and Jet Propulsion
2. Fundamentals of Nano Science
3. Operations Research
4. Robotics
5. Professional Ethics in Engineering
6. Computer Integrated Manufacturing Systems
7. Hydraulics And Pneumatics
8. Engineering Metallurgy
9. Unconventional Machining Processes
10. Design of Jigs, Fixtures and Press Tools
11. Mechatronics Laboratory
12. Design of Transmission Systems
13. Theory of Machines Laboratory
14. Theory of Machines-II
15. CAD / CAM Laboratory
16. Design /SOCIO Technical Project
17. Air Pollution And Control Engineering
18. Geographic Information Systems
19. Green building design
20. Waste water treatment
21. Professional Ethics in Engineering
22. Mechatronics

Inclusion of New Courses in B.Tech – Mechanical Engineering (PT) – (R-2019)

1. Machine Tool Technology
2. Production Planning and Control
3. Non Destructive Testing
4. Intellectual Property Rights

Change of Course Content in B.Tech – Mechanical Engineering (PT) – (R-2019)

1. Vibration and Noise Control
2. Mathematics for Industrial Operations
3. Nuclear Engineering

4. Composite Materials
5. Heat and Mass Transfer
6. Finite Elements Analysis
7. Computer Integrated Manufacturing
8. Robotics
9. Refrigeration and Air Conditioning
10. Heat Transfer Laboratory
11. Dynamics Laboratory

Inclusion of New Courses in M.Tech – Manufacturing Technology (FT) – (R-2019)

1. Financial Management
2. Manufacturing Information Systems
3. Finite Element Application in Manufacturing
4. Design and Analysis of Experiments
5. Advanced Metrology and Computer Aided Inspection
6. Optimization Techniques
7. Manufacturing Systems and Simulation
8. Artificial Intelligence and Neural Networks
9. Product Design and Development
10. Industrial Ergonomics

Change of Course Content in M.Tech – Manufacturing Technology (FT) – (R-2019)

1. Fluid Power Automation

Inclusion of New Courses in M.Tech – Manufacturing Technology (PT) – (R-2019)

1. Technical Writing/Seminars
2. Laser Material processing
3. Geometric Dimensioning and Tolerancing
4. Virtual Manufacturing
5. Supply Chain and Logistics Management
6. Industrial Surface Engineering
7. Plastic Process & Die Design
8. Fabrication Technology
9. Precision Engineering
10. Sustainable Manufacturing

Change of Course Content in M.Tech – Manufacturing Technology (PT) – (R-2019)

1. Artificial Intelligence and Neural Networks

Inclusion of Additional Elective courses in Mechanical Engineering (FT) – (R-2017)

1. Mechanical Vibration
2. MEMS

Value Added Courses





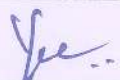


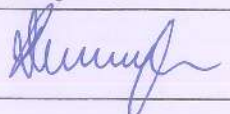
Based on the feedback received from various stakeholders, the members accepted to add the following value added courses for B.Tech (Mechanical Engineering) & M.Tech (Manufacturing Technology) programmes.

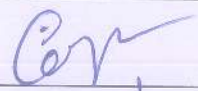
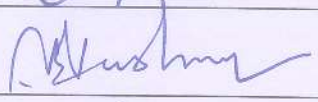

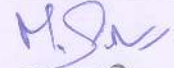
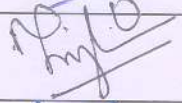
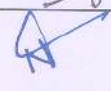


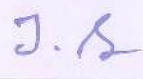
1. Certificate Course on 3-D Printing
2. Certificate Course on Piping Technology
3. Certificate Course on Pro-E
4. Certificate Course on Introduction to Psychology

- It is proposed to introduce the **Program Exit** course in the B.Tech (Mech-FT) curriculum to motivate the students towards writing competitive examinations and to improve their technical skills.
- The Committee proposed to follow the system of evaluation pattern for the project work.
- It is also proposed to consider **Value Education and Fundamentals of Indian Constitution and Economy** as Non-CGPA credit course.
- It is proposed to follow the revised CIA assessment pattern for experiential learning involved theory courses and highly significant practical courses.
- The members of the Board also scrutinized the updated panel of examiners for the B.Tech [Mechanical Engineering] – FT&PT and M.Tech [Manufacturing Technology] – FT&PT. The same was submitted to the Academic Council for approval.

The meeting was concluded with thanks from the BOS Chairman.

Signature of the members:

S.No	Name of the Member	Role	Signature
1	Dr. S. Dhanushkodi	Chairperson	
2	Dr.T.Madhusudhan	External Member	
3	Mr.A.Leelavinothan	External Member	
4	Dr.S.Devi	Invited Member	
5	Dr.T.V.Christy	Internal Member	Granted leave of absence*
6	Dr.V.Yalini	Internal Member	
7	Dr.S.Sukumar	Internal Member	Granted leave of absence*
8	Dr.TTM.Kannan	Internal Member	
9	M.Abdul Ghani Khan	Internal Member	
10	R.Tamizh Selvan	Internal Member	

11	P.Vijayakumar	Internal Member	
12	R.Baskaran	Internal Member	
13	K.Purushothaman	Internal Member	
14	M.Sudhahar	Internal Member	
15	P.Sarath Kumar	Internal Member	
16	N.Sivaharinathan	Internal Member	
17	J.Rajesh	Internal Member	
18	G.Arunkumar	Internal Member	Granted leave of absence*
19	G.Brithiviraj	Internal Member	
20	J.Selvamani	Internal Member	

* - Oral Inputs Received.




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SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF
MECHANICAL ENGINEERING

PROGRAM HANDBOOK

B.Tech – FULL TIME

[Regulation 2019]

COURSE STRUCTURE

B.E. MECHANICAL ENGINEERING

REGULATIONS – 2019

CHOICE BASED CREDIT SYSTEM

PROGRAMME EDUCATIONAL OBJECTIVES:

Bachelor of Mechanical Engineering curriculum is designed to impart Knowledge, Skill and Attitude on the graduates to

1. Have a successful career in Mechanical Engineering and allied industries.
2. Have expertise in the areas of Design, Thermal, Materials and Manufacturing.
3. Contribute towards technological development through academic research and industrial practices.
4. Practice their profession with good communication, leadership, ethics and social responsibility.
5. Graduates will adapt to evolving technologies through life-long learning.

PROGRAMME OUTCOMES:

Engineering Graduates will be able to:

- A. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of industrial problems.
- B. **Problem analysis:** Identify, formulates, and solve complex engineering problems. with high degree of competence.
- C. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
- D. **Design/development of solutions:** Design solutions for mechanical engineering problems and design components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- E. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering use modern tools, software and equipment to analyze multidisciplinary.
- F. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
- G. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
- H. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
- I. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

- J. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
- K. **Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
- L. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

**MAPPING OF PROGRAMME EDUCATIONAL OBJECTIVES WITH
PROGRAMME OUTCOMES**

PROGRAMME EDUCATIONAL OBJECTIVES	PROGRAMME OUTCOMES												
	A	B	C	D	E	F	G	H	I	J	K	L	M
1	3	3	2	3	2	1	1	2	1	1	3	1	3
2	3	3	3	3	3	1	1	1	1	1	1	2	2
3	3	3	3	3	3	3	2	3	1	2	2	2	2
4	3	3	2	3	3	2	3	2	1	2	2	2	2
5	3	3	3	3	3	3	3	2	2	2	2	2	2

1-Reasonable: 2- Significant: 3- Strong

I - VIII SEMESTER CURRICULUM AND SYLLABI

B.TECH (FT) MECHANICAL [Regulation 2019]

SEMESTER I

S.NO	COURSE CODE	COURSE TITLE	L	T	P	C
THEORY						
1.	19147S11	Communicative English	4	0	0	4
2.	19148S12	Engineering Mathematics - I	4	0	0	4
3.	19149S13	Engineering Physics	3	0	0	3
4.	19149S14	Engineering Chemistry	3	0	0	3
5.	19154S15	Engineering Graphics	2	0	4	4
6.	19150S16	Problem Solving and Python Programming	3	0	0	3
PRACTICAL						
7.	19150L17	Problem Solving and Python Programming Laboratory	0	0	4	2
8.	19149L18	Physics and Chemistry Laboratory	0	0	4	2
9.	191VEA19	Value Education				-
TOTAL			19	2	12	25



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SEMESTER II

S.NO.	COURSE CODE	COURSE TITLE	L	T	P	C
THEORY						
1.	19147S21	Technical English	4	0	0	4
2.	19148S22	Engineering Mathematics II	4	0	0	4
3.	19149S23C	Material Science	3	0	0	3
4.	19149S24A	Environmental Science And Engineering	3	0	0	3
5.	19153S25D	Basic Electrical, Electronics And Instrumentation Engineering	3	0	0	3
6.	19154S26D	Engineering Mechanics	3	2	0	4
PRACTICAL						
7.	19154L27	Engineering Practices Lab (All Branches)	0	0	3	2
8.	19153L28D	Basic Electrical, Electronics and Instrumentation Engineering Lab	0	0	3	2
9.	191ICA29	Fundamentals of Indian constitution and Economy				-
TOTAL			20	2	6	25



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SEMESTER III

S.NO.	COURSE CODE	COURSE TITLE	L	T	P	C
THEORY						
1.	19148S31C	Transforms and Partial Differential Equations	4	0	0	4
2.	19154C32	Engineering Thermodynamics	3	2	0	4
3.	19154C33	Fluid Mechanics and Machinery	4	0	0	4
4.	19154C34	Production Technology - I	3	0	0	3
5.	19154S35	Electrical Drives and Controls	3	0	0	3
PRACTICAL						
6.	19154L36	Production Technology Laboratory - I	0	0	3	2
7.	19154L37	Computer Aided Machine Drawing	0	0	3	2
8.	19154L38	Electrical Engineering Laboratory	0	0	3	2
9.	19154L39	Interpersonal Skills / Listening & Speaking	0	0	2	1
TOTAL			17	2	11	25



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SEMESTER IV

S.NO.	COURSE CODE	COURSE TITLE	L	T	P	C
THEORY						
1.	19148S41D	Statistics and Numerical Methods	4	0	0	4
2.	19154C42	Theory of Machines-I	3	0	0	3
3.	19154C43	Production Technology – II	3	0	0	3
4.	19154C44	Engineering Metallurgy	3	0	0	3
5.	19154C45	Strength of Materials for Mechanical Engineers	3	0	0	3
6.	19154C46	Thermal Engineering- I	3	0	0	3
Practical						
7.	19154L47	Production Technology Laboratory - II	0	0	3	2
8.	19154L48	Strength of Materials and Fluid Mechanics and Machinery Laboratory	0	0	3	2
9.	19154L49	Advanced Reading and Writing	0	0	2	1
Research Skill Based (RSB) Course						
10.	19154CRS	Research Led Seminar				1
TOTAL			19	0	8	25



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SEMESTER V

S.NO.	COURSE CODE	COURSE TITLE	L	T	P	C
THEORY						
1.	19154C51	Thermal Engineering- II	3	0	0	3
2.	19154C52	Design of Machine Elements	3	0	0	3
3.	19154C53	Metrology and Measurements	3	0	0	3
4.	191__OE54_	Open Elective I	3	0	0	3
5.	19154C55	Theory of Machines-II	3	2	0	4
PRACTICAL						
6.	19154L56	Theory of Machines Laboratory	0	0	3	2
7.	19154L57	Thermal Engineering Laboratory	0	0	3	2
8.	19154L58	Metrology and Measurements Laboratory	0	0	3	2
Research Skill Based (RSB) Course						
9.	19154CRM	Research Methodology				3
TOTAL			16	6	9	25


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SEMESTER VI

S.NO.	COURSE CODE	COURSE TITLE	L	T	P	C
THEORY						
1.	19154C61	Design of Transmission Systems	3	0	0	3
2.	19154C62	Computer Aided Design And Manufacturing	3	0	0	3
3.	19154C63	Heat and Mass Transfer	3	2	0	4
4.	19154C64	Finite Element Analysis	3	0	0	3
5.	19154C65	Hydraulics And Pneumatics	3	0	0	3
6.	19154E66_	Elective - I	3	0	0	3
PRACTICAL						
6.	19154L67	CAD / CAM Laboratory	0	0	3	2
7.	19154L68	Design and Fabrication Project	0	0	3	2
8.	19154L69	Professional Communication	0	0	2	1
Research Skill Based (RSB) Course						
9.	19154CBR	Participation in Bounded Research				1
TOTAL			18	2	8	25



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SEMESTER VII

S.NO.	COURSE CODE	COURSE TITLE	L	T	P	C
THEORY						
1.	19154C71	Power Plant Engineering	3	0	0	3
2.	19154C72	Process Planning and Cost Estimation	3	0	0	3
3.	19154C73	Mechatronics	3	0	0	3
4.	191__ OE74_	Open ElectiveII	3	0	0	3
5.	19154E75_	Elective II	3	0	0	3
6.	19154E76_	Elective III	3	0	0	3
PRACTICAL						
7.	19154L77	Simulation and Analysis Laboratory	0	0	3	2
8.	19154L78	Mechatronics Laboratory	0	0	3	2
9.	19154L79	Technical Seminar	0	0	2	1
Research Skill Based (RSB) Course						
10.	19154CSR	Design /SOCIO Technical Project				3
TOTAL			20	2	8	26




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SEMESTER VIII

S.No.	COURSE CODE	COURSE TITLE	L	T	P	C
THEORY						
1.	19154S81	Principles of Management	3	0	0	3
2.	19154E82_	Elective- IV	3	0	0	3
PRACTICAL						
3.	19154P83	Project Work	0	0	20	10
4.	19154PEE	Programme Exit Examination				2
TOTAL			6	0	20	18
TOTAL CREDITS						194




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.ELECTIVE – I (VI SEMESTER)

S.NO.	COURSE CODE	COURSE TITLE	L	T	P	C
1.	19154E66A	Automobile Engineering	3	0	0	3
2.	19154E66B	Safety in Engineering industries	3	0	0	3
3.	19154E66C	Gas Dynamics and Jet Propulsion	3	0	0	3
4.	19154E66D	Fundamentals of Nano Science	3	0	0	3

ELECTIVE – II (VII SEMESTER)

	COURSE CODE	COURSE TITLE	L	T	P	C
1.	19154E75A	Renewable Sources of Energy	3	0	0	3
2.	19154E75B	Nonconventional Machining Processes	3	0	0	3
3.	19154E75C	Operations Research	3	0	0	3
4.	19154E75D	Total Quality Management	3	0	0	3

ELECTIVE – III (VII SEMESTER)

Sl. No	COURSE CODE	COURSE TITLE	L	T	P	C
1.	19154E76A	Robotics	3	0	0	3
2.	19154E76B	Design of Jigs, Fixtures and Press Tools	3	0	0	3
3.	19154E76C	General Aspects of Energy Management and Energy audit	3	0	0	3
4.	19154E76D	Composite Materials	3	0	0	3

ELECTIVE – IV (VIII SEMESTER)

Sl. No	COURSE CODE	COURSE TITLE	L	T	P	C
1.	19154E82A	Production Planning and Control	3	0	0	3
2.	19154E82B	Computer Integrated Manufacturing Systems	3	0	0	3
3.	19154E82C	Energy Efficiency in Thermal Utilities	3	0	0	3
4.	19154E82D	Professional Ethics in Engineering	3	0	0	3



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OPEN ELECTIVE- I

Sl. No	DEPT	COURSE CODE	COURSE TITLE	L	T	P	C
1.	CSE	19150OE54A	Data Base management systems	3	0	0	3
2.		19150OE54B	Cloud computing	3	0	0	3
3.	ECE	19152OE54A	Basics Of Bio Medical Instrumentation	3	0	0	3
4.		19152OE54B	Sensors And Transducers	3	0	0	3
5.	EEE	19153OE54A	Industrial Nano Technology	3	0	0	3
6.		19153OE54B	Energy Conservation and Management	3	0	0	3
7.	CIVIL	19155OE54A	Air Pollution And Control Engineering	3	0	0	3
8.		19155OE54B	Geographic Information Systems	3	0	0	3

OPEN ELECTIVE- II

Sl. No	DEPT	COURSE CODE	COURSE TITLE	L	T	P	C
1.	CSE	19150OE74A	Introduction to C programming	3	0	0	3
2.		19150OE74B	Data structures and algorithms	3	0	0	3
3.	ECE	19152OE74A	Robotics	3	0	0	3
4.		19150OE74B	Electronic devices	3	0	0	3
5.	EEE	19153OE74A	Basic circuit theory	3	0	0	3
6.		19153OE74B	Introduction to renewable energy systems	3	0	0	3
7.	CIVIL	19155OE74A	Green building design	3	0	0	3
8.		19155OE74B	Waste water treatment	3	0	0	3


HOD

**Department of Mechanical Engineering
Ponnaiyah Ramaiyavam Institute of
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DEAN

**School of Engineering and Tech,
Ponnaiyah Ramajayam Institute of
Science and Technology (PRIST)
Deemed to be University
Vaitam, Thanjavur-613 403.**

CGPA CREDITS

Semester	Core	Elective	Open elective	Practical	Seminar	Exit exam	Project	RSD course	Total
I	24	-	-	04	-	-	-	-	28
II	24	-	-	04	-	-	-	-	28
III	18	-	-	07	-	-	-	-	25
IV	19	-	-	05	-	-	-	01	25
V	13	-	03	06	-	-	-	03	25
VI	16	03	-	05	-	-	-	2	26
VII	09	06	03	04	01	-	-	04	27
VIII	03	03	-	-	-	02	15	-	23
TOTAL									207

NON-CGPA CREDITS

Semester	Add on course	Total
I	01	01
II	01	01
III	-	-
IV	-	-
V	-	-
VI	-	-
VII	-	-
VIII	-	-
Co curricular Activities	In-plant Training , Industrial Visit , Seminars & Conferences	03
TOTAL NON-CGPA CREDITS		05

TOTAL CREDITS	
CGPA CREDITS	207
NON-CGPA CREDITS	05
TOTAL	212




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Ponnaiyah Ramajayam Institute of
Science and Technology (PRIST)
Deemed to be University
Vallam, Thanjavur-613,403.

PRIST
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THANJAVUR – 613 403 - TAMIL NADU

SCHOOL OF ENGINEERING AND TECHNOLOGY

**DEPARTMENT OF
MECHANICAL ENGINEERING**

PROGRAM HANDBOOK

B.Tech – FULL TIME

[Regulation 2017]

COURSE STRUCTURE

B.E. MECHANICAL ENGINEERING

REGULATIONS – 2017

CHOICE BASED CREDIT SYSTEM

PROGRAMME EDUCATIONAL OBJECTIVES:

Bachelor of Mechanical Engineering curriculum is designed to impart Knowledge, Skill and Attitude on the graduates to

1. Have a successful career in Mechanical Engineering and allied industries.
2. Have expertise in the areas of Design, Thermal, Materials and Manufacturing.
3. Contribute towards technological development through academic research and industrial practices.
4. Practice their profession with good communication, leadership, ethics and social responsibility.
5. Graduates will adapt to evolving technologies through life-long learning.

PROGRAMME OUTCOMES:

Engineering Graduates will be able to:

- A. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of industrial problems.
- B. **Problem analysis:** Identify, formulates, and solve complex engineering problems. with high degree of competence.
- C. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
- D. **Design/development of solutions:** Design solutions for mechanical engineering problems and design components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- E. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering use modern tools, software and equipment to analyze multidisciplinary.
- F. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
- G. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
- H. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
- I. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
- J. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write

effective reports and design documentation, make effective presentations, and give and receive clear instructions.

K. Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

L. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

MAPPING OF PROGRAMME EDUCATIONAL OBJECTIVES WITH PROGRAMME OUTCOMES

PROGRAMME EDUCATIONAL OBJECTIVES	PROGRAMME OUTCOMES												
	A	B	C	D	E	F	G	H	I	J	K	L	M
1	3	3	2	3	2	1	1	2	1	1	3	1	3
2	3	3	3	3	3	1	1	1	1	1	1	2	2
3	3	3	3	3	3	3	2	3	1	2	2	2	2
4	3	3	2	3	3	2	3	2	1	2	2	2	2
5	3	3	3	3	3	3	3	2	2	2	2	2	2

1-Reasonable: 2- Significant: 3- Strong


I - VIII SEMESTER CURRICULUM AND SYLLABI

B.TECH (FT) MECHANICAL [Regulation 2017]

SEMESTER I

S.NO.	COURSE CODE	COURSE TITLE	L	T	P	C
THEORY						
1.	17147S11	Communicative English	5	1	0	4
2.	17148S12	Engineering Mathematics - I	5	1	0	4
3.	17149S13	Engineering Physics	5	1	0	4
4.	17149S14	Engineering Chemistry	5	1	0	4
5.	17154S15	Engineering Graphics	5	1	0	4
6.	17150S16	Problem Solving and Python Programming	5	1	0	4
PRACTICAL						
7.	17150L17	Problem Solving and Python Programming Laboratory	0	0	3	2
8.	17149L18	Physics and Chemistry Laboratory	0	0	3	2
9.	171VEA19	Value Education				1
TOTAL			30	6	6	29


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**SEMESTER
II**

S.NO.	COURSE CODE	COURSE TITLE	L	T	P	C
THEORY						
1.	17147S21	Technical English (All Branches	5	1	0	4
2.	17148S22	Engineering Mathematics II (All Branches)	5	1	0	4
3	17149S23C	Material Science (MECH)	5	1	0	4
4.	17149S24A	Environmental Science And Engineering (CSE, EEE, MECH, CIVIL)	5	1	0	4
5.	17153S25D	Basic Electrical, Electronics And Instrumentation Engineering (MECH)	5	1	0	4
6.	17154S26D	Engineering Mechanics (MECH,CIVIL)	5	1	0	4
PRACTICAL						
7.	17154L27	Engineering Practices Lab (All Branches)	0	0	3	2
8.	17153L28D	Basic Electrical, Electronics and Instrumentation Engineering Lab (Mech)	0	0	3	2
9.	171ICA29	Fundamentals of Indian constitution and Economy				1
TOTAL			30	6	6	29




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**SEMESTER
III**

S.NO.	COURSE CODE	COURSE TITLE	L	T	P	C
THEORY						
1.	17148C31C	Transforms and Partial Differential Equations	4	0	0	4
2.	17154C32	Engineering Thermodynamics	3	2	0	4
3.	17154C33	Fluid Mechanics and Machinery	4	0	0	4
4.	17154C34	Production Technology - I	3	0	0	3
5.	17154C35	Electrical Drives and Controls	3	0	0	3
PRACTICAL						
6.	17154L36	Production Technology Laboratory - I	0	0	3	2
7.	17154L37	Computer Aided Machine Drawing	0	0	3	2
8.	17154L38	Electrical Engineering Laboratory	0	0	3	2
9.	17154L39	Interpersonal Skills / Listening & Speaking	0	0	2	1
TOTAL			17	2	11	25



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**SEMESTER
IV**

S.NO.	COURSE CODE	COURSE TITLE	L	T	P	C
THEORY						
1.	17148S41D	Statistics and Numerical Methods	4	0	0	4
2.	17154C42	Theory of Machines-I	3	0	0	3
3.	17154C43	Production Technology – II	3	0	0	3
4.	17154C44	Engineering Metallurgy	3	0	0	3
5.	17154C45	Strength of Materials for Mechanical Engineers	3	0	0	3
6.	17154C46	Thermal Engineering- I	3	0	0	3
PRACTICAL						
7.	17154L47	Production Technology Laboratory - II	0	0	3	2
8.	17154L48	Strength of Materials and Fluid Mechanics and Machinery Laboratory	0	0	3	2
9.	17154L49	Advanced Reading and Writing	0	0	2	1
10.	17154CRS	Research Led Seminar				1
TOTAL			19	0	8	25


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SEMESTER V

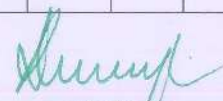
S.NO	COURSE CODE	COURSE TITLE	L	T	P	C
THEORY						
1.	17154C51	Thermal Engineering- II	3	0	0	3
2.	17154C52	Design of Machine Elements	3	0	0	3
3.	17154C53	Metrology and Measurements	3	0	0	3
4.	1715_FE54_	Free Elective I	3	0	0	3
5.	17154C55	Theory of Machines-II	4	2	0	4
PRACTICAL						
6.	17154L56	Theory of Machines Laboratory	0	0	3	2
7.	17154L57	Thermal Engineering Laboratory	0	0	3	2
8.	17154L58	Metrology and Measurements Laboratory	0	0	3	2
9.	17154CRM	Research Methodology	3	0	0	3
TOTAL			19	2	9	25

SEMESTER VI

S.NO	COURSE CODE	COURSE TITLE	L	T	P	C
THEORY						
1	17154C61	Design of Transmission Systems	3	0	0	3
2	17154C62	Computer Aided Design And Manufacturing	3	0	0	3
3	17154C63	Heat and Mass Transfer	3	2	0	4
4	17154C64	Finite Element Analysis	3	0	0	3
5	17154C65	Hydraulics And Pneumatics	3	0	0	3
6	17154E66_	Elective - I	3	0	0	3
PRACTICAL						
6.	17154L67	CAD / CAM Laboratory	0	0	3	2
7.	17154L68	Design and Fabrication Project	0	0	3	2
8.	17154L69	Professional Communication	0	0	2	1
9.	17154CBR	Participation in Bounded Research				2
TOTAL			18	2	8	26


HOD

11


DEAN

SEMESTER VII

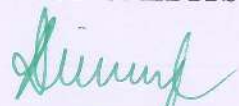
S.No	COURSE CODE	COURSE TITLE	L	T	P	C
THEORY						
1	17154C71	Power Plant Engineering	3	0	0	3
2	17154C72	Process Planning and Cost Estimation	3	0	0	3
3	17154C73	Mechatronics	3	0	0	3
4	1715_FE74	Free Elective II	3	0	0	3
5	17154E75-	Elective II	3	0	0	3
6	17154E76_	Elective III	3	0	0	3
PRACTICAL						
7	17154L77	Simulation and Analysis Laboratory	0	0	3	2
8	17154L78	Mechatronics Laboratory	0	0	3	2
9	17154L79	Technical Seminar	0	0	2	1
10	17154CSR	(Design Project /SOCIO Technical Project)				4
11.	17154COM	COMPS				2
TOTAL			18	0	8	29

SEMESTER VIII

S.N	COURSE CODE	COURSE TITLE	L	T	P	C
THEORY						
1	17154C81	Principles of Management	3	0	0	3
2	17154E82_	Elective- IV	3	0	0	3
PRACTICAL						
3	17154PW83	Project Work	0	0	20	10
TOTAL			6	0	20	16

TOTAL NO. OF CREDITS: 202


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 Ponnaiyah Ramajayam Institute of
 Science and Technology (PRIST)
 Deemed to be University
 Valiam, Thanjavur-613 403.


ELECTIVE – I (VI SEMESTER)

S.NO.	COURSE CODE	COURSE TITLE	L	T	P	C
1.	17154E66A	Automobile Engineering	3	0	0	3
2.	17154E66B	Welding Technology	3	0	0	3
3.	17154E66C	Gas Dynamics and Jet Propulsion	3	0	0	3
4.	17154E66D	Intellectual Property Rights	3	0	0	3
5.	17154E66E	Fundamentals of Nano Science	3	0	0	3
6.	17154E66F	Mechanical Vibration	3	0	0	3

ELECTIVE – II (VII SEMESTER)

SI. No	COURSE CODE	COURSE TITLE	L	T	P	C
1.	17154E74A	Refrigeration and Air conditioning	3	0	0	3
2.	17154E74B	Renewable Sources of Energy	3	0	0	3
3.	17154E74C	Quality Control and Reliability Engineering	3	0	0	3
4.	17154E74D	Unconventional Machining Processes	3	0	0	3
5.	17154E74E	Operations Research	3	0	0	3
6.	17154E74F	Additive Manufacturing	3	0	0	3
7.	17154E74G	Total Quality Management	3	0	0	3
8.	17154E74H	Automation In Manufacturing	3	0	0	3


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ELECTIVE – III (VII SEMESTER)

Sl. No	COURSE CODE	COURSE TITLE	L	T	P	C
1.	17154E76A	Robotics	3	0	0	3
2.	17154E76B	Design of Jigs, Fixtures and Press Tools	3	0	0	3
3.	17154E76C	Computational Fluid Dynamics	3	0	0	3
4.	17154E76D	Non Destructive Testing and Evaluation	3	0	0	3
5.	17154E76E	Composite Materials and Mechanics	3	0	0	3
6.	17154E76F	Human Rights	3	0	0	3
7.	17154E76G	Disaster Management	3	0	0	3

ELECTIVE – IV (VIII SEMESTER)

Sl. No	COURSE CODE	COURSE TITLE	L	T	P	C
1.	17154E82A	Production Planning and Control	3	0	0	3
2.	17154E82B	Entrepreneurship Development	3	0	0	3
3.	17154E82C	Computer Integrated Manufacturing Systems	3	0	0	3
4.	17154E82D	Vibration and Noise Control	3	0	0	3
5.	17154E82E	Micro Electro Mechanical Systems	3	0	0	3
6.	17154E82F	Professional Ethics in Engineering	3	0	0	3
7.	17154E82G	Production operation And Management	3	0	0	3



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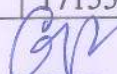
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Deemed to be University
Vallam, Thanjavur-613 403.**

FREE ELECTIVE – I

Sl. No	DEPT	COURSE CODE	COURSE TITLE	L	T	P	C
1.	CSE	17150FE54A	Data Base management systems	3	0	0	3
2.		17150FE54B	Cloud computing	3	0	0	3
3.	ECE	17152FE54A	Basics Of Bio Medical Instrumentation	3	0	0	3
4.		17152FE54B	Sensors And Transducers	3	0	0	3
5.	EEE	17153FE54A	Industrial Nano Technology	3	0	0	3
6.		17153FE54B	Energy Conservation and Management	3	0	0	3
7.	MECH	17154FE54A	Renewable energy sources	3	0	0	3
8.		17154FE54B	Automotive Systems	3	0	0	3
9.		17154FE54C	MEMS	3	0	0	3
10.	CIVIL	17155FE54A	Air Pollution And Control Engineering	3	0	0	3
11.		17155FE54B	Geographic Information Systems	3	0	0	3

FREE ELECTIVE – II

Sl. No	DEPT	COURSE CODE	COURSE TITLE	L	T	P	C
1.	CSE	17150FE74A	Introduction to C programming	3	0	0	3
2.		17150FE74B	Data structures and algorithms	3	0	0	3
3.	ECE	17152FE74A	Robotics	3	0	0	3
4.		17152FE74B	Electronic devices	3	0	0	3
5.	EEE	17153FE74A	Basic circuit theory	3	0	0	3
6.		17153FE74B	Introduction to renewable energy systems	3	0	0	3
7.	MECH	17154FE74A	Industrial safety	3	0	0	3
8.		17154FE74B	Testing of materials	3	0	0	3
9.	CIVIL	17155FE74A	Green building design	3	0	0	3
10.		17155FE74B	Waste water treatment	3	0	0	3


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No. 3, P. O. Box 19561
THANJAVUR - 613 003

School of Engineering and Tech.
Ponnaiyah Ramajayam Institute of
Science and Technology (PRIST)
Deemed to be University
Vaiiam, Thanjavur-613 403.

CGPA CREDITS

Semester	Core	Elective	Free Elective	Practical	Seminar	Comp s	Project	Research	TOTAL
I	24	-	-	04	-	-	-	-	28
II	24	-	-	04	-	-	-	-	28
III	18	-	-	07	-	-	-	-	25
IV	19	-	-	05	-	-	-	01	25
V	13	03	**	06	-	-	-	03	25
VI	16	03	-	05	-	-	-	2	26
VII	09	09	**	04	1	02	-	04	29
VIII	03	03	-	-	-	-	10	-	16
TOTAL									202

NON-CGPA CREDITS

Semester	Add on course	Total
I	01	01
II	01	01
III	-	-
IV	-	-
V	-	-
VI	-	-
VII	-	-
VIII	-	-
Co curricular Activities	In-plant Training , Industrial Visit , Seminars & Conferences	03
TOTAL NON-CGPA CREDITS		05

TOTAL CREDITS	
CGPA CREDITS	202
NON-CGPA CREDITS	05
TOTAL	207

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- Unit-1 Introduction 9
Types of vibrations, Definitions, Simple Harmonic Motion (S.H.M.), Work done by harmonic force, Principle of super position applied to SHM, Beats, Fourier theorem and problems. Principle modes of vibrations, Normal mode and natural frequencies of systems (without damping) – Simple spring mass systems, masses on tightly stretched strings, double pendulum, torsional systems, combined rectilinear and angular systems, geared systems and Problems. Undamped dynamic vibration absorber and Problems.
- Unit-2 Undamped (Single Degree of Freedom) Free Vibrations 9
Derivations for spring mass systems, Methods of Analysis, Natural frequencies of simple systems, Springs in series and parallel, Torsional and transverse vibrations, Effect of mass of spring and Problems. Introduction, Maxwell's reciprocal theorem, Influence coefficients, Rayleigh's method, Dunkerley's method, Stodola method, Holzer's method, Orthogonality of principal modes, method of matrix iteration and Problems.
- Unit-3 Damped free vibrations 9
Types of damping, Analysis with viscous damping - Derivations for over, critical and under damped systems, Logarithmic decrement and Problems. Signal analysis, dynamic testing of machines and structures, Experimental modal analysis, Machine condition monitoring and diagnosis.
- Unit-4 Forced Vibrations 9
Introduction, Analysis of forced vibration with constant harmonic excitation - magnification factor, rotating and reciprocating unbalances, excitation of support (relative and absolute amplitudes), force and motion transmissibility, Energy dissipated due to damping and Problems.
- Unit-5 Vibration Measuring Instruments and Whirling of shafts: Seismic Instruments 9
Vibrometers, Accelerometer, Frequency measuring instruments and Problems. Whirling of shafts with and without damping, discussion of speeds above and below critical speeds and Problems.



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UNIT I OVERVIEW AND INTRODUCTION 9

New trends in Engineering and Science: Micro and Nanoscale systems, Overview of Nano and Microelectromechanical Systems, Introduction to Design of MEMS and NEMS, Applications of Micro and Nanoelectromechanical systems, Microelectromechanical systems, devices and structures Definitions, Materials for MEMS: Silicon, Silicon Compounds, Polymers, Metals.

UNIT II MEMS FABRICATION TECHNOLOGIES 9

Microsystem fabrication processes: Photolithography, Ion Implantation, Diffusion, Oxidation. Thin film depositions: LPCVD, Sputtering, Evaporation, Electroplating; Etching techniques: Dry and wet etching, electrochemical etching; Micromachining: Bulk Micromachining, Surface Micromachining, High Aspect-Ratio (LIGA and LIGA-like) Technology; Packaging: Microsystems packaging, Essential packaging technologies, Selection of packaging materials

UNIT III MICRO SENSORS AND ACTUATORS 9

MEMS Sensors: Design of Acoustic wave sensors, resonant sensor, Vibratory gyroscope, Capacitive and Piezo Resistive Pressure sensors- engineering mechanics behind these Microsensors. Case study: Piezo-resistive pressure sensor. MicroActuators - Design of Actuators: Actuation using thermal forces, Actuation using shape memory Alloys, Actuation using piezoelectric crystals, Actuation using Electrostatic forces (Parallel plate, Torsion bar, Comb drive actuators), Micromechanical Motors and pumps. Case study: Comb drive actuators

UNIT IV RF AND BIO MEMS 9

Introduction to RF MEMS technologies: Need for RF MEMS components in communications, space and defense applications, Materials and fabrication technologies, Special considerations in RF MEMS design. Case studies: Micro-switches BioMEMS- Drug delivery, Electronic nose, Bio chip.

UNIT V NANOSYSTEMS AND QUANTUM MECHANICS 9

Atomic Structures and Quantum Mechanics, Molecular and Nanostructure Dynamics: Schrodinger Equation and Wave function Theory, Density Functional Theory, Nanostructures and Molecular Dynamics, Electromagnetic Fields and their quantization, Molecular Wires and Molecular Circuits



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PRO-E

UNIT 1-INTRODUCTION:

CAD/CAM/CAE Product cycle, Introduction to Parametric Technology, Introduction to Pro-E Environment & Menu bar, Use of Mouse. Sketcher: Creating 2D Geometry, Dimensioning & Modifying Dimensions, Modifying 2D Geometry and Construction Techniques like dynamic trim, Divide entity, Mirror, Copy, etc. Applying Constraints, Creating Parametric sketches.

UNIT 2-SOLID MODELING:

Basic: Understanding of Planes, Creating Solid using Extrude, Revolve, Sweep, etc. Modifying & Regenerating by Edit Definition, Applying Round, chamfer, Rib, etc., Working on Sets & Transitions, Creating & Working efficiently with datum Planes, Axis, curves, datum Points.

UNIT 3-ADVANCE: CREATING HOLES, SPRING & THREADS USING HELICAL SWEEP

Swept blend, Applying Draft ,etc Copying features, Patterning in Various method, Pipe, Various Bending & Blending, View manager for Cross Sections, Cosmetic features, Working With Units, Family table, Parameters & Relations, Display settings & other settings, Orientations.

UNIT 4-SURFACING: CREATING SURFACES

Construction Techniques like Fill, Project, Trim, mirror etc. Surface Operation & Modifying surfaces e.g. Merge Intersect, etc. Boundary Blend, Feature Options, Creating Solids from surfaces.

UNIT 5-ASSEMBLY:

Calling components, Constraining components, Assembly analysis, Working with Layers & Visibility, Patterning, Creating Assembly features, View manager, Exploded Views, Top-down & bottom-up design approach.



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INTRODUCTION TO PSYCHOLOGY

UNIT 1: INTRODUCTION TO PSYCHOLOGY:

Nature and scope; Methods and ethics in biopsychology; Divisions of biopsychology. The meaning of 'social'; Key assumptions and approaches to social psychology; Overview of the history of social psychology (including India); Relationship with sociology and anthropology; Areas of application: Health, Law, and Workplace. Social psychology and sustainable future.

UNIT 2: THE FUNCTIONING BRAIN: STRUCTURE, AND FUNCTIONS OF NEURONS;

Neural conduction and synaptic transmission. Understanding and evaluating the social world: Self and its processes: Self concept, Self-esteem, and self-presentation; Social identity and its functions. Social Cognition, Social perception, Attitudes, Attitude-behavior link; Strategies for attitude change.

UNIT 3: ORGANIZATION OF NERVOUS SYSTEMS:

CNS & PNS: Structure and functions. Functional abnormalities of neurotransmitters: dopamine and serotonin hypothesis. Neuroplasticity of Brain (neural degeneration, neural regeneration, and neural reorganization), hemispheric specialization.

UNIT 4: ENDOCRINE SYSTEM: STRUCTURE, FUNCTIONS AND ABNORMALITIES OF MAJOR GLANDS:

Thyroid, Adrenal, Gonads, Pituitary, Pancreas and Pineal. Social interaction and Influence: Interpersonal attraction, Pro-Social Behaviour, Aggression, Social influence.

UNIT V: GROUP DYNAMICS AND INTER-GROUP RELATIONS:

Nature of groups, Consequences of belonging - performance, decision making, cooperation and conflict. Nature of intergroup relations-prejudice, inter-group conflict, Intervention techniques.

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3D PRINTING

OBJECTIVE:

The students should be made to:

- Understand the basic concepts and nuances of 3D Printing Technology

UNIT I INTRODUCTION

9

Introduction; Design considerations – Material, Size, Resolution, Process; Modelling and viewing - 3D; Scanning; Model preparation – Digital; Slicing; Software; File formats

UNIT II PRINCIPLE

9

Processes – Extrusion, Wire, Granular, Lamination, Photopolymerisation; Materials - Paper, Plastics, Metals, Ceramics, Glass, Wood, Fiber, Sand, Biological Tissues, Hydrogels, Graphene; Material Selection - Processes, applications, limitations;

UNIT III INKJET TECHNOLOGY

9

Printer - Working Principle, Positioning System, Printhead, Printbed, Frames, Motion control; Printhead Considerations – Continuous Inkjet, Thermal Inkjet, Piezoelectric Drop-On-Demand; Material Formulation for jetting; Liquid based fabrication – Continuousjet, Multijet; Powder based fabrication – Colorjet;

UNIT IV LASER TECHNOLOGY

9

Light Sources – Types, Characteristics; Optics – Deflection, Modulation; Material feeding and flow – Liquid, powder; Printing machines – Types, Working Principle, Build Platform, Printbed Movement, Support structures;

UNIT V INDUSTRIAL APPLICATIONS

9

Product Models, manufacturing – Printed electronics, Biopolymers, Packaging, Healthcare, Food, Medical, Biotechnology, Displays; Opensource; Future trends;

TOTAL: 45 PERIODS

OUTCOMES:

Upon completion of the course, the student should be able to:

- Learn 3D printing workflow
- Understand the basic types of 3D Printing, materials used and their applications
- Select appropriate method for designing and modeling applications

TEXT BOOK



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1. Ian M. Hutchings, Graham D. Martin, "Inkjet Technology for Digital Fabrication", John Wiley & Sons, 2013.
2. Christopher Barnatt, "3D Printing: The Next Industrial Revolution", CreateSpace Independent Publishing Platform, 2013.

REFERENCES

1. Ibrahim Zeid, "Mastering CAD CAM" Tata McGraw-Hill Publishing Co.2007
2. Joan Horvath, "Mastering 3D Printing", APress, 2014 3. Chua, C.K., Leong K.F. and Lim C.S., "Rapid prototyping: Principles and applications", second edition, World Scientific Publishers, 2010.



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PIPING TECHNOLOGY

OBJECTIVE:

This class covers the following topics: piping design, the effects on overall configuration on preliminary piping design, initial layout, the total system, introduction to pipe stress analysis, detailed piping design, and how all of this influences pipe support and pipe hanger design.

Syllabus

Part 1: Introduction - Overview of Piping

1. This section serves as an introductory overview of piping system design.
 - a. Effects of operating conditions, including flow rate, design pressure and temperature on piping design
 - b. Impact of internal and external forces on the design.
 - c. Influences that the different modes of failure and the applicable codes have on the entire system.
 - d. Piping layout, an overview of the general support classifications.

Part 2: Preliminary Piping Design - Piping System Components

1. Concepts used in developing an initial piping layout.
2. Design principles including fluid properties, flow rate, and physical laws which influence the complete piping system layout.
3. Understand the effect of different piping system components, such as tanks, vessels, valves, and pumps, on the overall configuration.

Part 3: Preliminary Piping Design - The Total System

1. The total piping system.
2. The different types of equipment and components that define various types of piping systems.
3. Differences between series piping, parallel piping and branch piping as well as their specialized applications.
4. The piping system conditions such as static and dynamic head loss
5. Influences on the selection and distribution of piping components throughout the entire system.

Part 4: Basic Concepts of Stress Analysis - Flexibility Analysis

1. Historical perspective of how earlier analysis techniques were developed in the absence of today's computer technology.
2. Review how earlier techniques have evolved ultimately leading to today's finite element practices.
3. The basic concepts of stress analysis will be covered, including failure theories, stress intensification factors and the overall purpose of stress analysis.

Part 5: Basic Concepts of Stress Analysis - Design Bases

1. A review of the different phases of project evolution.
2. The design bases which form the foundation of all our analyses, including physical attributes,



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OUTCOMES:

- A general overview of piping engineering
- An awareness of the processes and issues involved with designing, procurement and construction
- An awareness of the materials and equipment used
- An understanding of industry terms and acronyms
- An understanding the stress analysis.



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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
MEETING OF BOARD OF STUDIES IN ELECTRONICS AND COMMUNICATION ENGINEERING
(10.04.2019)

MINUTES OF THE MEETING

The Meeting of Board of Studies in the Department of Electronics and Communication Engineering was held on 10.04.2019 at 11.00 am in the ECE LAB at PRIST University Vallam Campus under the Chairmanship of Prof. Dr. Smitha Elsa Peter.

The following Members attended the meeting:

S.No	Designation	Name
1	Chairperson/HoD	Dr. Smitha elsa peter
2	External Expert-Academic	Dr. Ambujam
3	External Expert- Industry	Mr.K.Tamilvendan
4	Professor	Dr. Smitha elsa peter
5	Professor	Dr. S. Devi
6	Associate Professor	Dr. N. Parvatham
7	Associate Professor	Dr. S. Audithan
8	Assistant Professor	E.Priyadharshini
9	Assistant Professor	R.Saraswathi
10	Special Invitee-Dean	Prof.R.Tamizhselvan
11	Special Invitee-Alumnus/Alumna	SUGAM VERMA
12	Special Invitee -Current student - UG or PG	PRABAKARAN. S

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

- The members of the Board thoroughly scrutinized the existing curriculum and syllabi for B.TECH - ECE (Full Time), M.TECH - Communication Systems (Full Time), B.TECH - ECE (Part Time), M.TECH-Communication Systems (Part Time) and feedbacks on

obtained from various stakeholders and it is resolved to consider the feedbacks on syllabus revision.

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- In the current regulation the courses have been classified as core course, elective course, foundation course and non-CGPA courses. ,
- It is proposed to follow the revised Continuous Internal Assessment pattern in the experiential involved learning theory courses and the highly significant practical courses.
 - CIA components - (Experiential learning involved Theory courses) Weekly Test I - 15marks + Weekly Test II – 15 marks + Pre-Semester – 30 marks + Experiential Learning Activity Completion Report - 20marks + Viva – Voce – 10 marks + seminar/Quiz - 10 marks = 100.(Weightage-40%)
 - CIA components-(Theory courses) Weekly Test I – 15 marks + Weekly Test II – 15 marks + Pre Semester - 30marks + Assignment / Activity - 20 marks + Seminar (PG) / Quiz / MCQ - 20 marks =100
 - CIA components - (Lab courses) Performance during practical session- 30marks + Model Practical Examination – 30 marks + Model Viva Voce Examination-10marks + Record Note Book - 10marks = 100
- It is Proposed to follow the revised Continuous Internal Assessment pattern ,Grading system and Credits from the batch of 2019-20 B. Tech –ECE students.
 - CIA components-(Experiential learning involved Theory courses) Weekly Test I - 15marks + Weekly Test II - 15marks + Pre-Semester -30marks + Experiential Learning Activity Completion Report - 20marks + Viva-Voce - 10 marks + seminar / Quiz - 10 marks = 100 (Weightage-40%)

Revised Grading System

Grade	GradePoints	MarkRange
O	10	91-100
A+	9	81-90
A	8	71-80
B+	7	61-70
B	6	50-60
RA	0	<50

Signature

Signature

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- It is suggested by the board to introduce the Program Exit Examination course in the curriculum to motivate the students towards writing competitive examination and to improve their technical skills
- The committee proposed to follow the system of evaluation pattern for the project work.
- It is also proposed to consider Value Education and Fundamentals of Indian Constitution and Economy as Non-CGPA credit course.
- The members of the board also scrutinized and updated the panel of examiners and recommended to continue with existing panel of examiners for the B.TECH –ECE (FT) & M.TECH – Communication Systems (FT), B.TECH – ECE (PT), M.TECH – Communication Systems (PT) and submitted the same for the Academic Council for its approval.
- Also the members of the board have unanimously recommended continuing with the existing curriculum of Regulation 2017 with addition of 2 new electives in 5th and 6th semester which is to be followed in the academic year 2019 – 20 for B. Tech ECE (Full Time).

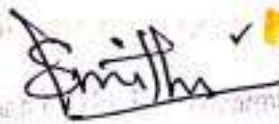
o The List of suggested subjects are:

S. No	Course Code	Name of the Course
1	17152E56H	RF Microelectronics
2	17152E66H	Digital Switching and Transmission

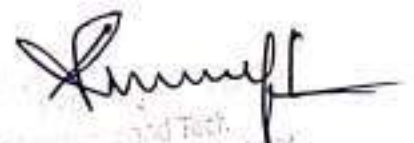
- Apart from Curriculum courses the Board members discussed with the feedback taken from various stake holders with respect of increasing the skill and potential of students. Finally came out with suggesting 4 new courses can introduced as Value added courses for the benefit of students.

- The list of suggested Value added courses are as follows:

- ✓ Design Of Embedded And Real Time Systems
- ✓ Robotics And Its Application
- ✓ Internet Of Things With Node MCU
- ✓ PCB Design And Fabrication



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B.TECH-ECE (FULL TIME&PART TIME)

ITEM 1: It is suggested by board members, A new course 19152E66I/19152E54FP-Software Engineering introduced by replacing 17152E66D/1749E54AP -Multimedia Compression and Communication/ Environmental Science and Engineering to get the Knowledge of basic software engineering methods and practices, and their appropriate application, layered technology and Process frame work, different software architectural styles, quality control and to ensure good quality software as an elective course in 5th semester .

ITEM 2:It is proposed by board, A new course 19152E56H/19152E44FP - Digital Audio Engineering is introduced in 4th semester elective instead of the existing course 17152E56A/17152E44AP-Object Oriented Programming/High Speed Networks to identify acoustic and electronic concepts; describe waveform properties; explain microphone characteristics and placement; describe studio set-up and signal routing; explain console and recording operation techniques; and identify basic recording studio procedures.

ITEM 3: The Board members are suggested that by replacing 17152E56C - Operating Systems, A new course 19152E56I - Logic and Distributed Control Systems introduced to give an introductory knowledge on Programmable Logic Controller (PLC) and their Programming languages, applications of PLC, Computer Controlled Systems, the architecture and local control unit of Distributed Control System(DCS), interfaces used in DCS in 5th semester as elective.

ITEM 4: In 6th semester, the board suggested 19152E66H-SCADA System and Applications Management is introduced as elective instead of the course 17152E66C-MEMS and NEMS to understand about the SCADA system components and SCADA communication protocols, SCADA applications in power system.

ITEM 5: It is proposed to introduce 19152E76H/19152E74FP - Space Time Wireless Communication new course introduced instead of 17152E76C/17152E74EP - Foundation Skills in Integrated Product Development / Computer Hardware and Interfacing course to describe the Space Time MIMO concept of wireless communication systems. the capacity and bit error rate for a given digital modulation scheme of OFDM and spread spectrum modulation techniques, SIMO, MISO and MIMO wireless communication system in Rayleigh frequency flat and frequency selective fading environment, the in space time wireless communications in 7th semester.

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ITEM 6: The board members are suggested that by Replacing 17152E76D-Machine Learning Techniques a new course 19152E76I- Telecommunication Network Management introduced to appreciate the need for interoperable network management concepts and architecture, SNMP and TMN, Advanced Information Processing Techniques such as Distributed Object Technologies, Software Agents and Internet Technologies used for network management .

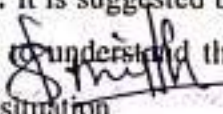
ITEM 7: The members of the board suggested that the 19152E81G- Telecommunication System Modeling and Simulation is introduced in 8th semester as new elective course by replacing 17152E81B-Low Power SoC Design to study various system modeling and simulation techniques, and highlight their applications in different areas including modeling, design, simulation, planning, verification and validation.

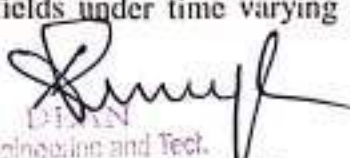
ITEM 8: It is proposed by members to introduce 19152E81H/19152E64FP -Transducer Engineering is introduced in 8th semester as elective new course instead of 17152E81C/17150E64EP -Photonic Networks/Network Security to explain the classification and static characteristics of transducers, various measurement standards and various errors and perform error analysis.

ITEM 9: In 8th semester A new course 19152E82H Telehealth Technology is suggested by board members to introduce instead of 17152E82C- Satellite Communication to study about increase access to care, improve patient care outcomes, reduce costs, better utilize healthcare resources, and be highly satisfying to patients and healthcare consumers

ITEM 10: It is proposed by board members that by replacing 17152E82B- DSP Architecture and Programming to study Environmental Impact Assessment (EIA), A new course 19152E82G- Environmental and Social Impact Assessment introduced procedures that should be followed in order to comply with requirements for a sound Environmental Impact Assessment process and tools to support EIA, methods of improving the effectiveness of assessment to investigate the environmental and social implications of projects and investment initiatives in 8th semester.

ITEM 11: It is suggested by board that the course 17152C12P – Electromagnetic Theory, UNIT IV is revised to understand the relation between the electric and magnetic fields under time varying harmonic situation


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M.TECH - COMMUNICATION SYSTEMS (FULL TIME&PART TIME)

ITEM 1: The board members are suggested that a new course 19271E25E/19271E25EP- Advanced Antenna Design introduced to understand the antenna radiation characteristics and arrays, enhance the student knowledge in the area of various antenna design, enhance the student knowledge in the area of antenna for practical applications in 2nd semester as an elective.


ITEM 2: It is proposed by that an elective course 19271E32E/19271E32EP-Pattern Recognition and Machine Learning in 3rd semester is introduced to study the fundamental of pattern classifier, know about various clustering concepts, originate the various structural pattern recognition and feature extraction, understand the basic of concept learning and decision trees and explore recent advances in pattern recognition.

ITEM 3: It is suggested that the new course 19271E34E/19271E34EP-Network Processors is introduced as a to learn network processors, study commercial network processors and understand network processor architecture.

ITEM 4: It is proposed to introduce, a new elective course 19271E16E/19271E16EP-Advanced Satellite Communication and Navigation Systems is introduced to learn M2M developments and satellite applications, understand Satellite Communication In Ipv6 Environment.

ITEM 5: It is suggested by board members to introduce a new course to understand the concepts of basic wireless communication concepts, study the parameters in receiver and low noise amplifier design, study the various types of mixers designed for wireless communication, study and design PLL and VCO and understand the concepts of transmitters and power amplifiers in wireless communication 19271E24E/19271E24EP-VLSI for Wireless Communication as elective course

ITEM 6: The Board members suggested that a new course 19271E33E/19271E33EP-Internet of Things is introduced to understand the fundamentals of Internet of Things, learn about the basics of IOT protocols, build a small low cost embedded system using Raspberry Pi and apply the concept of Internet of Things in the real world scenario.

ITEM 7: It is suggested by board members to revise the course 17271H13P in  2 i.e OFDM and its applications are included.

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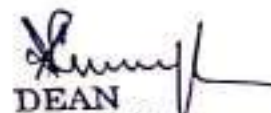
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Signature of the members:

S.No	Designation	Name	Signature
1	Chairperson/HoD	Dr. Smitha elsa peter	Smitha
2	External Expert-Academic	Dr. Ambujam	Ambujam
3	External Expert- Industry	Mr.K.Tamilvendan	K. Tamilvenda
4	Professor	Dr. Smitha elsa peter	Smitha
5	Professor	Dr. S. Devi	S. Devi
6	Associate Professor	Dr. N. Parvatham	N. Parvatham
7	Associate Professor	Dr. S. Audithan	S. Audithan
8	Assistant Professor	E.Priyadharshini	E. Priyadharshini
9	Assistant Professor	R.Saraswathi	R. Saraswathi
10	Special Invitee-Dean	Prof.R.Tamizhselvan	R. Tamizhselvan
11	Special Invitee-Alumnus/Alumna	SUGAM VERMA	Sugam Verma
12	Special Invitee -Current student - UG or PG	PRABAKARAN. S	P. Prabakaran


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B. TECH (FULL TIME) – ECE – R2019

I - VIII SEMESTERS CURRICULUM AND SYLLABI

SEMESTER I

Sl No	COURSE CODE	COURSE TITLE	L	T	P	C
THEORY						
1.	19147S11	Communicative English	4	0	0	4
2.	19148S12	Engineering Mathematics I	4	0	0	4
3.	19149S13	Engineering Physics	3	0	0	3
4.	19149S14	Engineering Chemistry	3	0	0	3
5.	19154S15	Engineering Graphics	2	0	4	4
6.	19150S16	Problem Solving and Python Programming	3	0	0	3
PRACTICALS						
7.	19150L19	Problem Solving and Python Programming Lab	0	0	4	2
8.	19149L18	Physics and Chemistry Lab	0	0	4	2
9.	191VEA19	Value Education				-
TOTAL			19	0	12	25

SEMESTER II

Sl No	COURSE CODE	COURSE TITLE	L	T	P	C
THEORY						
1.	19147S21	Technical English	4	0	0	4
2.	19148S22	Engineering Mathematics II	4	0	0	4
3.	19149S23B	Physics for Electronics Engineering	3	0	0	3
4.	191523S24B	Circuit Analysis	4	0	0	4
5.	19153S25B	Basic Electrical And Instrumentation Engineering	3	0	0	3
6.	19152S26B	Electronic Devices	3	0	0	3
PRACTICALS						
7.	19154L27	Engineering Practices Lab	0	0	4	2
8.	19152L28B	Circuits and Devices Lab	0	0	4	2
9.	1911CA29	Fundamentals of Indian Constitution and Economy				-
TOTAL			21	0	8	25

SEMESTER III

Sl No	COURSE CODE	COURSE TITLE	L	T	P	C
THEORY						
1.	19148S31B	Linear Algebra and Partial Differential Equations	4	0	0	4
2.	19152C32	Control Systems Engineering	3	0	0	3
3.	19152C33	Fundamentals of Data Structures In C	3	0	0	3
4.	19152C34	Digital Electronics	3	0	0	3

5.	19152C35	Signals and Systems	4	0	0	4
6.	19152C36	Electronic Circuits- I	3	0	0	3
PRACTICALS						
7.	19152L37	Fundamentals of Data Structures in C Lab	0	0	4	2
8.	19152L38	Analog and Digital Circuits Lab	0	0	4	2
9.	19152L39	Interpersonal Skills / Listening & Speaking	0	0	2	1
TOTAL			20	0	10	25

SEMESTER IV

Sl No	COURSE CODE	COURSE TITLE	L	T	P	C
THEORY						
1.	19148S41B	Probability and Random Processes	4	0	0	4
2.	19152C42	Electronic Circuits II	3	0	0	3
3.	19152C43	Communication Theory	3	0	0	3
4.	19152C44	Electromagnetic Fields	4	0	0	4
5.	19152C45	Linear Integrated Circuits	3	0	0	3
6.	19149S46	Environmental Science and Engineering	3	0	0	3
PRACTICALS						
7.	19152L47	Circuits Design and Simulation Lab	0	0	4	2
8.	19152L48	Linear Integrated Circuits Lab	0	0	4	2
Research Skill Development (RSD) Course						
9.	19152CRS	Research Led Seminar				1
TOTAL			20	0	8	25

SEMESTER V

Sl No	COURSE CODE	COURSE TITLE	L	T	P	C
THEORY						
1.	19152C51	Digital Communication	3	0	0	3
2.	19152C52	Discrete-Time Signal Processing	4	0	0	4
3.	19152C53	Computer Architecture and Organization	3	0	0	3
4.	191_FE5_4	Free Elective - I	3	0	0	3
5.	19152C55	Communication Networks	3	0	0	3
6.	19152E56	Elective - I	3	0	0	3
PRACTICALS						
7.	19152L57	Discrete-Time Signal Processing Lab	0	0	4	2
8.	19152L58	Communication Systems Lab	0	0	4	2
9.	19152L59	Communication Networks Lab	0	0	4	2
Research Skill Development (RSD) Course						
10.	19152CRM	Research Methodology	3	0	0	3
TOTAL			19	0	12	28

Head of Department
Department of Electronics and
Communication Engineering
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No. 3 of the UGC Act, 1956)
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School of Engineering and Tech:
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No. 3 of the UGC Act, 1956)
THANJAVUR, THANJAVUR DISTRICT, TAMIL NADU.

SEMESTER VI

Sl No	COURSE CODE	COURSE TITLE	L	T	P	C
THEORY						
1.	19152C61	Microprocessors and Microcontrollers	3	0	0	3
2.	19152C62	VLSI Design	3	0	0	3
3.	19152C63	Wireless Communication	3	0	0	3
4.	19152C64	Principles of Management	3	0	0	3
5.	19152C65	Transmission Lines and RF Systems	3	0	0	3
6.	19152E66	Elective - II	3	0	0	3
PRACTICALS						
7.	19152L67	Microprocessors and Microcontrollers Lab	0	0	4	2
8.	19152L68	VLSI Design Lab	0	0	4	2
9.	19152L69	Professional Communication	0	0	2	1
10.	19152LTS	Technical Seminar	0	0	2	1
Research Skill Development (RSD) Course						
11.	19152CBR	Participation in Bounded Research				1
TOTAL			18	0	12	25

SEMESTER VII

Sl No	COURSE CODE	COURSE TITLE	L	T	P	C
THEORY						
1.	19152C71	Antennas and Microwave Engineering	3	0	0	3
2.	19152C72	Optical Communication	3	0	0	3
3.	19152C73	Embedded and Real Time Systems	3	0	0	3
4.	191 FE74	Free Elective - II	3	0	0	3
5.	19152C75	Adhoc and Wireless Sensor Networks	3	0	0	3
6.	19152E76	Elective - III	3	0	0	3
PRACTICALS						
7.	19152L77	Embedded Lab	0	0	4	2
8.	19152L78	Advanced Communication Lab	0	0	4	2
Research Skill Development (RSD) Course						
9.	19152CSR	Design/Socio-Technical Project				3
TOTAL			18	0	8	25

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SEMESTER VIII

Sl No	COURSE CODE	COURSE TITLE	L	T	P	C
THEORY						
1.	19152E81	Elective – IV	3	0	0	3
2.	19152E82	Elective – V	3	0	0	3
PRACTICALS						
3.	19152P83	Project Work	0	0	20	10
4.	19152PEE	Programme Exit Examination	0	0	0	2
TOTAL			6	0	20	18
TOTAL NO. OF CREDITS:						196

LIST OF ELECTIVES

ELECTIVE - I (SEMESTER V)

Sl No	COURSE CODE	COURSE TITLE	L	T	P	C
1.	19152E56 B	Medical Electronics	3	0	0	3
2.	19152E56 E	Nanotechnology and Applications	3	0	0	3
3.	19152E56 G	Total Quality Management	3	0	0	3
4.	19152E56 H	Digital Audio Engineering	3	0	0	3
5.	19152E56 I	Logic and Distributed Control Systems	3	0	0	3

ELECTIVE - II (SEMESTER VI)

Sl No	COURSE CODE	COURSE TITLE	L	T	P	C
1.	19152E66A	Cryptography and Network Security	3	0	0	3
2.	19152E66B	Advanced Digital Signal Processing	3	0	0	3
3.	19152E66F	Wireless Networks	3	0	0	3
4.	19152E66H	SCADA System and Applications Management	3	0	0	3
5.	19152E66I	Software Engineering	3	0	0	3

ELECTIVE - III (SEMESTER VII)

Sl No	COURSE CODE	COURSE TITLE	L	T	P	C

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1.	19152E76A	Advanced Wireless Communication	3	0	0	3
2.	19152E76B	Cognitive Radio	3	0	0	3
3.	19152E76F	Mixed Signal IC Design	3	0	0	3
4.	19152E76H	Space Time Wireless Communication	3	0	0	3
5.	19152E76I	Telecommunication Network Management	3	0	0	3

ELECTIVE - IV (SEMESTER VIII)

Sl. No	COURSE CODE	COURSE TITLE	L	T	P	C
1.	19152E81A	Electro Magnetic Interference and Compatibility	3	0	0	3
2.	19152E81E	Digital Image Processing	3	0	0	3
3.	19152E81F	Professional Ethics in Engineering	3	0	0	3
4.	19152E81G	Telecommunication System Modeling and Simulation	3	0	0	3
5.	19152E81H	Transducer Engineering	3	0	0	3

ELECTIVE - V (SEMESTER VIII)

Sl. No	COURSE CODE	COURSE TITLE	L	T	P	C
1.	19152E82B	DSP Architecture and Programming	3	0	0	3
2.	19152E82C	Satellite Communication	3	0	0	3
3.	19152E82F	Fundamentals of Nanoscience	3	0	0	3
4.	19152E82G	Environmental and Social Impact Assessment	3	0	0	3
5.	19152E82H	Telehealth Technology	3	0	0	3

Smith

Shree

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 Head of the Department of
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 Chennai - 600 025

LIST OF FREE ELECTIVES
FREE ELECTIVE - I (SEMESTER V)

Sl. No	DEPT	COURSE CODE	COURSE TITLE	L	T	P	C
1.	CSE	19150FE54A	Database Management Systems	3	0	0	3
2.		19150FE54B	Cloud Computing	3	0	0	3
3.	EEE	19153FE54A	Industrial Nano Technology	3	0	0	3
4.		19153FE54B	Energy Conservation and Management	3	0	0	3
5.	MECH	19154FE54A	Renewable Energy Sources	3	0	0	3
6.		19154FE54B	Automotive Systems	3	0	0	3
7.	CIVIL	19155FE54A	Air Pollution and Control Engineering	3	0	0	3
8.		19155FE54B	Geographic Information System	3	0	0	3

FREE ELECTIVE - II (SEMESTER VII)

Sl. No	DEPT	COURSE CODE	COURSE TITLE	L	T	P	C
1.	CSE	19150FE74A	Introduction to C Programming	3	0	0	3
2.		19150FE74B	Data Structures and Algorithms	3	0	0	3
3.	EEE	19153FE74A	Basic Circuit Theory	3	0	0	3
4.		19153FE74B	Introduction to Renewable Energy Systems	3	0	0	3
5.	MECH	19154FE74A	Industrial Safety	3	0	0	3
6.		19154FE74B	Testing of Materials	3	0	0	3
7.	CIVIL	19155FE74A	Green Building Design	3	0	0	3
8.		19155FE74B	WasteWater Treatment	3	0	0	3

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B.TECH (FULL TIME) – ECE – R2019

COURSE STRUCTURE AND CREDITS DISTRIBUTION

Semester	Foundati on Course	Core Courses		Elective Courses		Others	Total
		Theory	Practical	Core Electives	Open Electives		
I	14	7	4	-	-	-	25
II	11	109	4	-	-	-	25
III	4	16	5	-	-	-	25
IV	7	13	4	-	-	1	25
V	-	13	6	3	3	3	28
VI	3	12	6	3	-	1	25
VII	-	12	4	3	3	3	25
VIII	-	-	10	6		2	18
TOTAL CGPA CREDITS							196

NON-CGPA CREDITS

Semester	Add on course	Total
I	-	
II	-	
III	-	-
IV	-	-
V	01	01
VI	-	-
VII	01	01
VIII	-	-
TOTAL NON-CGPA CREDITS		02

TOTAL CREDITS	
CGPA CREDITS	196
NON-CGPA CREDITS	02
TOTAL	198

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AIM:

To understand the concept of fundamentals of digital audio..To understand the concept of audio in digital TV broadcasting.

OBJECTIVES:

- To understand the various codes of digital coding.
- To understand the concept of digital audio tape recorder.
- To analyze the concept internet audio in digital audio engineering.

UNIT I FUNDAMENTALS OF DIGITAL AUDIO**9**

Discrete time sampling - sampling theorem - Nyquist frequency - aliasing - prevention quantization - signal to error ratio - distortion - other architectures - dithers - types of dither.

UNIT II RECORDING AND TRANSMISSION PRINCIPLES**9**

PCM - record processing - recording oriented codes - transmission oriented codes - audio digital TV broadcasting - DAB.

UNIT III DIGITAL CODING & COMPRESSION**9**

Block & convolutional codes - cyclic codes - Reed Solomon codes - interleaving - compression principles - lossless & perceptive coding - subband codes - transform coding - compression formats - MPEG audio - Dolby AC 3 - ATRAC.

UNIT IV DIGITAL AUDIO TECHNIQUES**9**

Digital audio tape recorder - cassettes - modes - track format - digital audio editing - editing v random access media & recording media - editor structure - digital audio in optical disks - MD, DVD, playing optical disk - Minidisk.

UNIT V APPLICATIONS OF DIGITAL AUDIO**9**

Internet audio - MP3 - SDMI - audio MPEG 4 - PC - MIDI - sound cards.

TOTAL: 45 PERIODS**OUTCOMES:**

At the end of the course, students would be able to:

- Analyze the type of dither.
- Analyze the recording and transmission principles in digital audio.
- Analyze the various compression techniques.
- Design and analyze the digital audio editing.
- Analyze the various applications of digital audio.

TEXT BOOKS:

1. John Watkinson, "An Introduction to Digital Audio", Focal Press, Second edition, 2013.
2. Ken C Pohlmann, "Principles of Digital audio", McGraw Hill, Sixth edition, 2010.

REFERENCES:

1. The Ballin, "Handbook for sound Engineers Taylor & Francis", Fifth edition, 2015.
2. John Watkinson, "The art of Digital Audio" Focal Press, Third edition, 2013.

[Handwritten notes and stamps]
 Department of Electronics and
 Telecommunication Engineering
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 Technology
 Mumbai
 Maharashtra
 India

[Handwritten signature]
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 Head of Department
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19152E81A ELECTROMAGNETIC INTERFERENCE AND COMPATIBILITY

L T P C
3 0 0 3

AIM:

To understand different electromagnetic Interference problems occurring in Intersystem and in inter system and their possible mitigation techniques in Electronic design

OBJECTIVES:

- To introduce the basic concepts of Electromagnetic Interference
- To teach the importance of Electromagnetic Compatible designs
- To explain the existing standards for Electromagnetic Compatibility

UNIT I EMI/EMC CONCEPTS

9

EMI-EMC definitions; Sources and Victims of EMI; Conducted and Radiated EMI Emission and Susceptibility; C Histories; Radiation Hazards to humans.

UNIT II EMI COUPLING PRINCIPLES

9

Conducted, radiated and transient coupling; Common ground impedance coupling; Common mode and ground I coupling; Differential mode coupling; Near field cable to cable coupling; Field to cable coupling; Power mains and Po supply coupling; Transient EMI, ESD.

UNIT III EMI CONTROL

9

Shielding; EMI Filters; Grounding; Bonding; Isolation transformer; Transient suppressors; EMI Suppression Cables.

UNIT IV EMC DESIGN FOR CIRCUITS AND PCBS

9

Noise from Relays and Switches; Nonlinearities in Circuits; Cross talk in transmission line and cross talk cont Component selection and mounting; PCB trace impedance; Routing; Power distribution decoupling; Zoning; Ground VIAs; Terminations.

UNIT V EMI MEASUREMENTS AND STANDARDS

9

Open area test site; TEM cell; EMI test shielded chamber and shielded ferrite lined anechoic chamber; Line impeda stabilization networks; EMI Rx and spectrum analyzer; Civilian standards - CISPR, FCC, IEC, EN; Military standar MIL461E/462.

TOTAL: 45 PERIO

OUTCOMES:

At the end of the course, the student should be able to:

- Identify the various types and mechanisms of Electromagnetic Interference
- Propose a suitable EMI mitigation technique
- Describe the various EMC Standards and methods to measure them

TEXT BOOKS:

1. V.P.Kodali, —Engineering EMC Principles, Measurements and TechnologiesI, IEEE Press, Newyork, 1996.(Unit V)
2. Henry W.Ott., Noise Reduction Techniques in Electronic SystemsI, A Wiley Inter Science
3. Publications, John Wiley and Sons, Newyork, 1988. (Unit – IV)

REFERENCES:

1. C.R.Paul,"Introduction to Electromagnetic Compatibility", John Wiley and Sons, Inc, 1992.
2. Bernhard Keiser, "Principles of Electromagnetic Compatibility", 3rd Ed, Artech house, Norwood, 1986.
3. Don R. J.White Consultant Incorporate, "Handbook of EMI/EMC", Vol I-V, 1988.

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B.TECH (PART TIME) – ECE - R2019

SEMESTER-I

S.NO	SUB CODE	SUBJECT NAME	L	T	P	C
1	19148S11BP	Transforms and Partial Differential Equations	3	1	0	4
2	19152H12P	Electromagnetic Theory	3	1	0	4
3	19152H13P	Digital Electronics	4	0	0	4
4	19152H14P	Electronic Circuits - I	3	0	0	3
5	19152H15P	Signals and Systems	3	1	0	4
TOTAL CREDITS						19

SEMESTER-II

S.NO	SUB CODE	SUBJECT NAME	L	T	P	C
1	19148S21P	Numerical Methods	3	1	0	4
2	19153S22P	Electrical Engineering and Control Systems	4	0	0	4
3	19152H23P	Linear Integrated Circuits	4	0	0	4
4	19152H24P	Electronic Circuits - II	3	0	0	3
5	19152H25P	Transmission Lines and Waveguides	4	0	0	4
TOTAL CREDITS						19

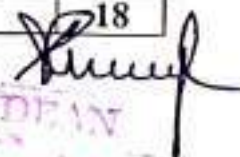
SEMESTER-III

S.NO	SUB CODE	SUBJECT NAME	L	T	P	C
1.	19148S31BP	Probability and Random Processes	3	1	0	4
2.	19152H32P	Microprocessor Interfacing and Applications	4	0	0	4
3.	19152H33P	Digital Signal Processing	3	1	0	4
4.	19152H34P	Communication Theory	4	0	0	4
5.	19152L35P	Digital Signal Processing and Microprocessor Lab	0	0	3	2
TOTAL CREDITS						18

SEMESTER-IV

S.N O	SUB CODE	SUBJECT NAME	L	T	P	C
1	19152H41P	Digital Communication	4	0	0	4
2	19152H42P	Antenna and Wave Propagation	4	0	0	4
3	19152H43P	Computer Networks	4	0	0	4
4	191 E44 P	Elective-I	4	0	0	4
5	19152L45P	Networks and Communication Lab	0	0	3	2
TOTAL CREDITS						18

Head of the Department
 Department of ECE, Anna University
 Chennai - 600 025
 Permittance of free space is 8.854×10^{-12} F/m
 Permeability of free space is $4\pi \times 10^{-7}$ H/m
 Limitations of transmission line theory
 1. & 2. of the TDR method
 FAX: 044-2619 403, Tamil Nadu


 DEAN
 School of ECE, Anna University
 Chennai - 600 025
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SEMESTER-V

S.N O	SUB CODE	SUBJECT NAME	L	T	P	C
1	19152H51P	Optical Communication and Networks	4	0	0	4
2	19152H52P	Microwave Engineering	4	0	0	4
3	19152H53P	VLSI Design	4	0	0	4
4	191_E54_P	Elective II	4	0	0	4
5	19152L55P	Optical Communication and Microwave Lab	0	0	3	2
TOTAL CREDITS						18

SEMESTER-VI

S.N O	SUB CODE	SUBJECT NAME	L	T	P	C
1	19152H61P	Mobile and Wireless Communication	4	0	0	4
2	19152H62P	Medical Electronics	4	0	0	4
3	19152H63P	Microcontroller and Embedded Systems	4	0	0	4
4	191_E64_P	Elective III	4	0	0	4
5	19152L65P	VLSI and Embedded Systems Lab	0	0	3	2
TOTAL CREDITS						18

SEMESTER-VII

S.N O	SUB CODE	SUBJECT NAME	L	T	P	C
1	19160S71P	Total Quality Management	4	0	0	3
2	19152H72P	Wireless Networks	4	0	0	4
3	19152H73P	Telecommunication Switching and Networks	4	0	0	4
4	191_E74_P	Elective IV	3	0	0	3
5	19152P75P	Project Work & Viva Voce	0	0	12	6
TOTAL CREDITS						20

LIST OF ELECTIVES ELECTIVE-I (SEMESTER-IV)

S.No	Sub Code	Sub Name	L	T	P	C
1	19152E44AP	High Speed Networks	4	0	0	4
2	19152E44BP	Advanced Digital Signal Processing	4	0	0	4
3	19152E44CP	Speech Processing	4	0	0	4
4	19152E44DP	Fuzzy Logic and Neural Networks	4	0	0	4
5	19152E44FP	Digital Audio Engineering	4	0	0	4

ELECTIVE-II (SEMESTER-V)

S.No	Sub Code	Sub Name	L	T	P	C
1	19152E54BP	Optoelectronic Devices	4	0	0	4
2	19152E54CP	Radar and Navigational Aids	4	0	0	4
3	19152E54DP	Digital Image Processing	4	0	0	4
4	19152E54EP	Engineering Acoustics	4	0	0	4
5	19152E54FP	Software Engineering	4	0	0	4

ELECTIVE-III (SEMESTER-VI)

S.No	Sub Code	Sub Name	L	T	P	C
1	19160E64AP	Principles of Management	4	0	0	4
2	19152E64BP	Satellite Communication	4	0	0	4
3	19152E64CP	Robotics	4	0	0	4
4	19152E64DP	Remote Sensing	4	0	0	4
5	19152E64FP	Transducer Engineering	4	0	0	4

ELECTIVE-IV (SEMESTER-VII)

S.No	Sub Code	Sub Name	L	T	P	C
1	19152E74AP	Power Electronics	3	0	0	3
2	19152E74BP	Advanced Microprocessors	3	0	0	3
3	19152E74CP	Electromagnetic Interference and Compatibility	3	0	0	3
4	19152E74DP	Solid State Electronic Drives	3	0	0	3
5	19152E74FP	Space Time Wireless Communication	3	0	0	3

B.TECH (PART TIME) – ECE – R2019

COURSE STRUCTURE AND CREDITS DISTRIBUTION

Semester	Foundation Course	Core		Electives	Open Electives	Others	Total
		Theory	Practical				
1	4	15	-	-	-	-	19

Signature

Signature
DEAN

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II	4	15	-	-	-	-	19
III	4	12	2	-	-	-	18
IV	-	12	2	4	-	-	18
V	-	12	2	4	-	-	18
VI	-	12	2	4	-	-	18
VII	3	8	6	3	-	-	20
TOTAL CGPA CREDITS							130

19152E74FP SPACE TIME WIRELESS COMMUNICATION

L T I
3 0

AIM:

To understand the concept of multiple antenna propagation. To understand the concept of capacity frequency flat deterministic MIMO channel.

OBJECTIVES:

- To understand the concept of multiple antenna propagation.
- To understand the concept of capacity of frequency flat deterministic MIMO channel.
- To understand the concept of transmitter and receiver diversity technique.
- To design the coding for frequency flat channels.
- To analyze the concept of micro multi user detection.

UNIT I MULTIPLE ANTENNA PROPAGATION AND ST CHANN. CHARACTERIZATION 9

Wireless channel – Scattering model in macrocells – Channel as a ST random field – Scattering function Polarization and field diverse channels – Antenna array topology – Degenerate channels – reciprocity and implications – Channel definitions – Physical scattering model – Extended channel model – Channel measurements – sampled signal model – ST multiuser and ST interference channels – ST channel estimation.

UNIT II CAPACITY OF MULTIPLE ANTENNA CHANNELS 9

Capacity of frequency flat deterministic MIMO channel: Channel unknown to the transmitter – Channel known to the transmitter – capacity of random MIMO channels – Influence of rician fading – fading correlation – X and degeneracy on MIMO capacity – Capacity of frequency selective MIMO channels.

UNIT III SPATIAL DIVERSITY 9

Diversity gain – Receive antenna diversity – Transmit antenna diversity – Diversity order and channel variability – Diversity performance in extended channels – Combined space and path diversity – Indirect transmit diversity – Diversity of a space-time – frequency selective fading channel.

UNIT IV MULTIPLE ANTENNA CODING AND RECEIVERS 9

Coding and interleaving architecture – ST coding for frequency flat channels – ST coding for frequency selective channels – Receivers – SISO – SIMO – MIMO – Iterative MIMO receivers – Exploiting channel knowledge

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at the transmitter: linear pre-filtering – optimal pre-filtering for maximum rate – optimal pre-filtering for rate minimization – selection at the transmitter – Exploiting imperfect channel knowledge

UNIT V ST OFDM, SPREAD SPECTRUM AND MIMO MULTIUSER DETECTION

SISO-OFDM modulation, MIMO-OFDM modulation – Signaling and receivers for MIMO- OFDM – SISO- modulation – MIMO-SS modulation – Signaling and receivers for MIMO – S.MIMO – MAC – MIMO – B Outage performance for MIMO-MU – MIMO - MU with OFDM – CDMA and multiple antennas. **TOTAL: 45 PERIO**

OUTCOMES:

- At the end of the course, students would be able to
- Design and analyze the channel characterization.
 - Analyze the capacity of random MIMO channel.
 - Design and analyze the order diversity and channel variability.
 - Analyze the multiple antenna coding and receivers.
 - Analyze the MIMO multi user detection

TEXT BOOKS:

1. Sergio Verdu, "Multi User Detection", Cambridge University Press, 2011.
2. Paulraj, Rohit Nabar, Dhananjay Gore, "Introduction to Space Time Wireline Communication Systems", Cambridge University Press, 2008.

REFERENCES:

1. Don Tarrieri, "Principles of Spread Spectrum Communication systems", Springer, Third edition, 2001.

M.TECH - COMMUNICATION SYSTEMS (PART TIME) – R2019

SEMESTER I

S.N	SUB CODE	SUBJECT	L	T	P	C
Theory						
1	19248S11BP	Applied mathematics for Electronics Engineering	3	1	0	4
2	19271C12P	Statistical Signal Processing	3	1	0	4
3	19271C13P	Modern Digital Communication Systems	3	1	0	4
Practical						
4	19271L14P	Communication Systems Lab - I	0	0	3	3
Research Skill Development (RSD) Course						
5	19271CRSP	Research Led Seminar	1	0	0	1
Total Credits						16

SEMESTER II

S.N	SUB CODE	SUBJECT	L	T	P	C
Theory						
1	19271C21P	Mobile Communication Networks	4	0	0	4
2	19271C22P	Advanced Microwave Systems	4	0	0	4
3	19271E23 P	Elective-I	4	0	0	4

Approved by the Board of Technical Education, Hyderabad (Institution Approved in the Year 2014 under the UGC Act, 1956)

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M.Tech and Tech
Department of Electronics and Communication Engineering

Practical						
4	19271L24P	Communication Systems Lab - II	0	0	3	3
5	1927TECWRP	Technical Writing /Seminars	0	0	3	3
Research Skill Development (RSD) Course						
6	19271CRMP	Research Methodology	3	0	0	3
7	19271CBRP	Participation in Bounded Research	0	0	2	2
Total Credits						23

SEMESTER III

S.N	SUB CODE	SUBJECT	L	T	P	C
Theory						
1	19271C31P	Communication Protocol Engineering	4	0	0	4
2	19271C32P	Advanced Radiation Systems	4	0	0	4
3	19271E33_P	Elective – II	4	0	0	4
Research Skill Development (RSD) Course						
4	19271CSR	Design/socio technical project	0	0	4	4
Total Credits						16

SEMESTER IV

S.N	SUB CODE	SUBJECT	L	T	P	C
Theory						
1	19271C41P	Wireless Sensor Networks	4	0	0	4
2	19271C42P	Fiber Optic Networking	4	0	0	4
3	19271C43_P	Elective-III	4	0	0	4
Project						
4	19271P44P	Project Phase – I	0	0	6	6
Total Credits						18

SEMESTER V

S.N	SUB CODE	SUBJECT	L	T	P	C
Theory						
1	19271E51_P	Elective-IV	4	0	0	4
2	19271E52_P	Elective-V	4	0	0	4
3	19271E53_P	Elective-VI	4	0	0	4
Total Credits						12

SEMESTER VI

S.N	SUB CODE	SUBJECT	L	T	P	C
1	19271P61P	Project Phase – II	0	0	12	12
Total Credits						12
Total Credits for the Programme						97

Smith

LIST OF ELECTIVES

Elective-I (SEMESTER – II)

Dean,
School of Engineering and Technology,
Pondicherry Engineering College,
Karaikal.
(Institution Deemed to be University)
No. 3 of the UGC Act, 1956
THANJAVUR - 613 003, Tamil Nadu

Ramya
DEAN
School of Engineering and Tech,
Pondicherry Engineering College,
Karaikal
Deemed to be University
Vilvam, Thanjavur-613 003.

S.N	SUB CODE	SUBJECT	L	T	P	C
1.	1927E23AP	High Speed Switching Architecture	4	0	0	4
2.	1927E23BP	DSP Processor Architecture and Programming	4	0	0	4
3.	1927E23CP	Digital Speech Processing	4	0	0	4
4.	1927E23DP	ASIC and FPGA Design	4	0	0	4
5.	1927E23EP	VLSI for Wireless Communication	4	0	0	4

Elective-II (SEMESTER - III)

S.N	SUB CODE	SUBJECT	L	T	P	C
1.	1927E33AP	Internetworking and Multimedia	4	0	0	4
2.	1927E33BP	Digital Image Processing	4	0	0	4
3.	1927E33CP	LASER Communication	4	0	0	4
4.	1927E33DP	MEMS and NEMS	4	0	0	4
5.	1927E33EP	Advanced Satellite Communication and Navigation Systems	4	0	0	4

Elective-III (SEMESTER - IV)

S.N	SUB CODE	SUBJECT	L	T	P	C
1.	1927E43AP	Digital Communication Receivers	4	0	0	4
2.	1927E43BP	Soft Computing	4	0	0	4
3.	1927E43CP	Communication Network Security	4	0	0	4
4.	1927E43DP	Radar Signal Processing	4	0	0	4
5.	1927E43EP	Advanced Antenna Design	4	0	0	4

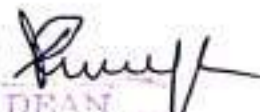
Elective-IV (SEMESTER - V)

S.N	SUB CODE	SUBJECT	L	T	P	C
1.	1927E51AP	Software Defined Radio	4	0	0	4
2.	1927E51BP	Satellite Communication	4	0	0	4
3.	1927E51CP	CDMA Systems	4	0	0	4
4.	1927E51DP	Speech Processing and Synthesis	4	0	0	4
5.	1927E51EP	Pattern Recognition and Machine Learning	4	0	0	4

Elective-V (SEMESTER - V)

S.N	SUB CODE	SUBJECT	L	T	P	C
1.	1927E52AP	Wavelets and Multi Resolution Processing	4	0	0	4
2.	1927E52BP	High performance Communication Networks	4	0	0	4
3.	1927E52CP	Advanced Microprocessors and Microcontrollers	4	0	0	4
4.	1927E52DP	Reconfigurable computing	4	0	0	4
5.	1927E52EP	Internet of Things	4	0	0	4

Elective-VI (SEMESTER - V)


 DEAN
 School of Engineering and Technology
 Anna University
 Chennai-600 025

M.TECH (PART TIME) - COMMUNICATION SYSTEMS
COURSE STRUCTURE AND CREDITS DISTRIBUTION

Sem.	Core Courses						Elective Courses		Total Credits
	Theory Courses		Practical Courses		Courses on *RSD		Nos.	Credits	
	Nos.	Credits	Nos.	Credits	Nos.	Credits			
I	03	12	01	03	01	01	-	-	16
II	02	08	02	06	02	05	01	04	23
III	02	08	-	-	01	04	01	04	16
IV	02	08	-	-	01	06	01	04	18
V	-	-	-	-	-	-	03	12	12
VI	-	-	-	-	01	12	-	-	12
Total.Credits									97

Smithy

Head of Department
 Department of Electronics and
 Telecommunication Engineering
 Poonamallee Engineering College
 Poonamallee, Chennai - 600 099
 Tamil Nadu, India

Shree

DEAN
 School of Engineering and Tech
 Poonamallee Engineering College
 Poonamallee, Chennai - 600 099
 Tamil Nadu, India

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

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

M2M high-level ETSI 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

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

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.

UNIT V CASE STUDIES AND REAL-WORLD APPLICATIONS

Real world design constraints-Applications-Asset management, Industrial automation, smart grid, Commercial building automation, Smart cities - participatory sensing - Data Analytics for IoT - Software & Management Tools for IoT Cloud Storage Models & Communication APIs - Cloud for IoT- Amazon Web Services for IoT.

TOTAL : 45 PERIODS**OUTCOMES:**

Upon completion of the course, the student should be able to:

- Analyze various protocols for IoT
- Develop web services to access/control IoT devices.
- Design a portable IoT using Raspberry Pi
- Deploy an IoT application and connect to the cloud.
- Analyze applications of IoT in real time scenario

REFERENCES:

1. Arshdeep Bahga, Vijay Madisetti, "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, Stamatias, 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.

**M.TECH .COMMUNICATION SYSTEMS -FULL TIME-R2019
SEMESTER I**

S.N	SUB CODE	SUBJECT	L	T	P	C
Theory						
1	19248S11B	Applied mathematics for Electronics Engineering	3	1	0	4
2	19271C12	Statistical Signal Processing	3	1	0	4
3	19271C13	Modern Digital Communication Systems	3	1	0	4
4	19271C14	Communication Protocol Engineering	4	0	0	4
5	19271C15	Advanced Radiation Systems	4	0	0	4
6	19271E16	Elective-I	4	0	0	4
Practical						
8	19271L17	Communication Systems Lab - I	0	0	3	3
Research Skill Development (RSD) Course						
7	19271CRS	Research Led Seminar	1	0	0	1
Total Credits					28	

SEMESTER II

S.N	SUB CODE	SUBJECT	L	T	P	C
Theory						
1	19271C21	Mobile Communication Networks	4	0	0	4
2	19271C22	Advanced Microwave Systems	4	0	0	4
3	19271C23	Fiber Optic Networking	4	0	0	4
4	19271E24	Elective-II	4	0	0	4
5	19271E25	Elective-III	4	0	0	4
Practical						
6	19271L26	Communication Systems Lab - II	0	0	3	3
7	192TECWR	Technical Writing /Seminars	0	0	3	3
Research Skill Development (RSD) Course						
8	19271CRM	Research Methodology	3	0	0	3
9	19271CBR	Participation in Bounded Research	2	0	0	2
Total Credits					31	

SEMESTER III

S.N	SUB CODE	SUBJECT	L	T	P	C
Theory						
1	19271C31	Wireless Sensor Networks	4	0	0	4
2	19271E32-	Elective - IV	4	0	0	4
3	19271E33-	Elective - V	4	0	0	4
4	19271E34-	Elective - VI	4	0	0	4
Research Skill Development (RSD) Course						
5	19271P35	Project Phase - I	0	0	6	6
6	19271CSR	Design/Socio technical project	4	0	0	4
Total Credits					26	

Signature
 School of Engineering and Tech
 For aiken Ramaiah Institute of
 Science and Technology (PILIT)
 Deemed to be University
 Bangalore, Karnataka 560075

SEMESTER IV

S.N	SUB CODE	SUBJECT	L	T	P	C
1	19271P41	Project Phase – II	0	0	12	12
Total Credits			12			

Elective-I

S.N	SUB CODE	SUBJECT	L	T	P	C
1.	19271E16A	Internetworking and Multimedia	4	0	0	4
2.	19271E16B	Digital Image Processing	4	0	0	4
3.	19271E16C	LASER Communication	4	0	0	4
4	19271E16D	MEMS and NEMS	4	0	0	4
5.	19271E16E	Advanced Satellite Communication and Navigation Systems	4	0	0	4

Elective-II

S.N	SUB CODE	SUBJECT	L	T	P	C
1.	19271E24A	High Speed Switching Architecture	4	0	0	4
2.	19271E24B	DSP Processor Architecture and Programming	4	0	0	4
3.	19271E24C	Digital Speech Processing	4	0	0	4
4	19271E24D	ASIC and FPGA Design	4	0	0	4
5	19271E24E	VLSI for Wireless Communication	4	0	0	4

Elective-III

S.N	SUB CODE	SUBJECT	L	T	P	C
1.	19271E25A	Digital Communication Receivers	4	0	0	4
2.	19271E25B	Soft Computing	4	0	0	4
3.	19271E25C	Communication Network Security	4	0	0	4
4.	19271E25D	Radar Signal Processing	4	0	0	4
5.	19271E25E	Advanced Antenna Design	4	0	0	4

Elective-IV

S.N	SUB CODE	SUBJECT	L	T	P	C
1.	19271E32A	Software Defined Radio	4	0	0	4
2.	19271E32B	Satellite Communication	4	0	0	4
3.	19271E32C	CDMA Systems	4	0	0	4
4	19271E32D	Speech Processing and Synthesis	4	0	0	4
5.	19271E32E	Pattern Recognition and Machine Learning	4	0	0	4

Elective-V

S.N	SUB CODE	SUBJECT	L	T	P	C
1.	19271E33A	Wavelets and Multi Resolution Processing	4	0	0	4
2.	19271E33B	High performance Communication Networks	4	0	0	4
3.	19271E33C	Advanced Microprocessors and Microcontrollers	4	0	0	4
4	19271E33D	Reconfigurable Computing	4	0	0	4
5.	19271E33E	Internet of Things	4	0	0	4

Department of Electrical and Electronic Engineering
 Faculty of Engineering and Technology
 Indian Institute of Space Science and Technology
 Thiruvananthapuram

School of Engineering and Tech
 Indian Institute of Space Science and Technology (IIST)
 Thiruvananthapuram University
 Vaidyanthapuram-610 403.

Elective-VI

S.N	SUB CODE	SUBJECT	L	T	P	C
1.	19271E34A	Simulation of Communication Networks	4	0	0	4
2.	19271E34B	Medical Imaging	4	0	0	4
3.	19271E34C	Mobile ADHOC networks	4	0	0	4
4	19271E34D	Ultra Wide Band Communication	4	0	0	4
5	19271E34E	Network Processors	4	0	0	4

PRIST UNIVERSITY

M.TECH-Full Time- Course Structure and Credit Distribution

Semester	Theory Courses		Elective Courses		Practical Courses		Courses on *RSD		Total Credits
	Nos.	Credits	Nos.	Credits	Nos.	Credits	Nos.	Credits	
I	05	20	01	04	01	03	01	01	28
II	04	12	02	08	02	06	02	05	31
III	01	04	03	12	-	-	02	10	26
IV	-	-	-	-	-	-	01	12	12
Total Credits									97

*RSD-Research Skill Development

Signature

Signature

School of Engineering and Tech
 Pricolaxy Ramapuram, Institute of
 Science and Technologies (PRIST)
 Prist University
 Vallam, Thanjavur-613 413

19271E24E VLSI for Wireless Communication

LTPC

3003

OBJECTIVES:

- To understand the concepts of basic wireless communication concepts.
- To study the parameters in receiver and low noise amplifier design.
- To study the various types of mixers designed for wireless communication.
- To study and design PLL and VCO.
- To understand the concepts of transmitters and power amplifiers in wireless communication.

UNIT I COMMUNICATION CONCEPTS

Introduction – Overview of Wireless systems – Standards – Access Methods – Modulation schemes – Classical channel – Wireless channel description – Path loss – Multipath fading – Standard Translation.

UNIT II RECEIVER ARCHITECTURE & LOW NOISE AMPLIFIERS

Receiver front end – Filter design – Non-idealities – Design parameters – Noise figure & Input intercept point. LNA Introduction – Wideband LNA design – Narrow band LNA design: Impedance matching & Core amplifier.

UNIT III MIXERS

Balancing Mixer - Qualitative Description of the Gilbert Mixer - Conversion Gain – Distortion – Noise - A Complete Active Mixer. Switching Mixer – Distortion, Conversion Gain & Noise in Unbalanced Switching Mixer - A Practical Unbalanced Switching Mixer. Sampling Mixer - Conversion Gain, Distortion, Intrinsic & Extrinsic Noise in Single Ended Sampling Mixer.

UNIT IV FREQUENCY SYNTHESIZERS

PLL – Phase detector – Dividers – Voltage Controlled Oscillators – LC oscillators – Ring Oscillators – Phase noise – Loop filters & design approaches – A complete synthesizer design example (DECT) – Frequency synthesizer with fractional divider.

UNIT V TRANSMITTER ARCHITECTURES & POWER AMPLIFIERS

Transmitter back end design – Quadrature LO generator – Power amplifier design.

TOTAL : 45 PERIODS

OUTCOMES:

At the end of this course, the student should be able to

- Design LNA and Mixers
- Evaluate frequency synthesizers
- Design and analyze power amplifiers

REFERENCES:

1. Bosco H Leung "VLSI for Wireless Communication", Pearson Education, 2002.
2. B. Razavi, "RF Microelectronics", Prentice-Hall, 1998.
3. Behzad Razavi, "Design of Analog CMOS Integrated Circuits" McGraw-Hill, 1999.
4. Emad N Farag and Mohamed I Elmasry, "Mixed Signal VLSI wireless design – Circuits & Systems", Kluwer Academic Publishers, 2000.
5. J. Crols and M. Steyaert, "CMOS Wireless Transceiver Design," Boston, Kluwer Academic Pub., 1997.
6. Thomas H. Lee, "The Design of CMOS Radio – Frequency Integrated Circuits", Cambridge University Press, 2003.

19271E33E Internet of Things

LTPC
3000

3000
3000

OBJECTIVES:

- To understand the fundamentals of Internet of Things
- To learn about the basics of IOT protocols
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TOTAL : 45 PERIODS

OUTCOMES:

Upon completion of the course, the student should be able to:

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1. Arshdeep Bahga, Vijay Madiseti, "Internet of Things – A hands-on approach", Universities Press, 2015
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3. Honbo Zhou, "The Internet of Things in the Cloud: A Middleware Perspective", CRC Press, 2012.
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5. Olivier Hersent, David Boswarthick, Omar Elloumi, "The Internet of Things – Key applications and Protocols", Wiley, 2012.



PRIST DEEMED UNIVERSITY

Vallam, Thanjavur

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF
ELECTRONICS & COMMUNICATION ENGINEERING

PROGRAM HANDBOOK

B.TECH - FULL TIME

Smitha
Head of the Department
Department Of Electronics and
Communication Engineering
Ponnaiyah Ramajayam Institute of
Science & Technology (PRIST)
(Institution deemed to be University
under Section 3 of the UGC Act, 1956)
VALLAM - 613 403, TA

[REGULATION 2017]

Shreef
DEAN
School of Engineering and Technology
Ponnaiyah Ramajayam Institute of
Science and Technology (PRIST)
Deemed to be University
Vallam, Thanjavur-613,403.

PROGRAMME EDUCATIONAL OBJECTIVES:

- PEO1: To enable graduates to pursue research, or have a successful career in academia or industries associated with Electronics and Communication Engineering, or as entrepreneurs.
- PEO2: To provide students with strong foundational concepts and also advanced techniques and tools in order to enable them to build solutions or systems of varying complexity.
- PEO3: To prepare students to critically analyze existing literature in an area of specialization and ethically develop innovative and research oriented methodologies to solve the problems identified.

PROGRAMME OUTCOMES:

Engineering Graduates will be able to:

Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change and Tech.

MAPPING OF PROGRAMME EDUCATIONAL OBJECTIVES WITH PROGRAMME OUTCOMES

A broad relation between the programme objective and the outcomes is given in the following table

PROGRAMME EDUCATIONAL OBJECTIVES	PROGRAMME OUTCOMES												
	A	B	C	D	E	F	G	H	I	J	K	L	M
1	3	3	2	3	2	1	1	2	1	1	3	1	3
2	3	3	3	3	3	1	1	1	1	1	1	2	2
3	3	3	3	3	3	2	2	3	1	2	2	2	2

Contribution 1: Reasonable 2: Significant 3: Strong

Smitha
 Head of the Department
 Department Of Electronics and
 Communication Engineering
 Ponnaiyah Ramajayam Institute of
 Science & Technology (PRIST)
 (Institution Deemed to be University
 1173 of the UGC Act, 1956)
 THANJAVUR - 613 403, TAMIL NADU.

[Signature]
 School of Engineering and Tech.
 Ponnaiyah Ramajayam Institute of
 Science and Technology (PRIST)
 School of Engineering and Tech.
 Ponnaiyah Ramajayam Institute of
 Science and Technology (PRIST)
 Deemed to be University
 Vallam, Thanjavur-613 403.

I - VIII SEMESTERS CURRICULUM AND SYLLABI

IT#0

SEMESTER I

Sl. No	COURSE CODE	COURSE TITLE	L	T	P	C
THEORY						
1.	17147S11	Communicative English	5	1	0	4
2.	17148S12	Engineering Mathematics I	5	1	0	4
3.	17149S13	Engineering Physics	5	1	0	4
4.	17149S14	Engineering Chemistry	5	1	0	4
5.	17154S15	Engineering Graphics	5	1	0	4
6.	17150S16	Problem Solving and Python Programming	5	1	0	4
PRACTICALS						
7.	17150L17	Problem Solving and Python Programming Lab	0	0	3	2
8.	17149L18	Physics and Chemistry Lab	0	0	3	2
9.	171VEA19	Value Education				1
TOTAL			30	6	6	29

SEMESTER II

Sl. No	COURSE CODE	COURSE TITLE	L	T	P	C
THEORY						
1.	17147S21	Technical English	5	1	0	4
2.	17148S22A	Engineering Mathematics II	5	1	0	4
3.	17149S23B	Physics for Electronics Engineering	5	1	0	4
4.	17152S24B	Circuit Analysis	5	1	0	4
5.	17153S25B	Basic Electrical And Instrumentation Engineering	5	1	0	4
6.	17152S26B	Electronic Devices	5	1	0	4
PRACTICALS						
7.	17154L27	Engineering Practices Lab	0	0	3	2
8.	17152L28B	Circuits and Devices Lab	0	0	3	2
9.	171ICA29	Fundamentals of Indian Constitution and Economy				1
TOTAL			30	6	6	29

SEMESTER III

Sl. No	COURSE CODE	COURSE TITLE	L	T	P	C
THEORY						
1.	17148S31B	Linear Algebra and Partial Differential Equations	4	0	0	4
2.	17152C32	Control Systems Engineering	3	0	0	3
3.	17152C33	Fundamentals of Data Structures In C	3	0	0	3
4.	17152C34	Digital Electronics	3	0	0	3
5.	17152C35	Signals and Systems	4	0	0	4
6.	17152C36	Electronic Circuits- I	3	0	0	3
PRACTICALS						
7.	17152L38	Fundamentals of Data Structures In C Laboratory	0	0	3	2
8.	17152L39	Analog and Digital Circuits Laboratory	0	0	3	2
9.	17152L39	Interpersonal Skills / Listening & Speaking	0	0	2	1
TOTAL			20	0	2	25

Department of Electronics Engineering
Ponnaiyah Ramajayam Institute of Science & Technology (PRIST)
Institution Deemed to be University
11th 3 of the UGC Act, 1956
THANJAVUR - 613 403, TAMIL NADU.

SEMESTER IV

School of Engineering and Tech.
Ponnaiyah Ramajayam Institute of Science and Technology (PRIST)
Deemed to be University
Vallam, Thanjavur-613,403.

Sl. No	COURSE CODE	COURSE TITLE	L	T	P	C
THEORY						
1.	17148S41B	Probability and Random Processes	4	0	0	4
2.	17152C42	Electronic Circuits II	3	0	0	3
3.	17152C43	Communication Theory	3	0	0	3
4.	17152C44	Electromagnetic Fields	4	0	0	4
5.	17152C45	Linear Integrated Circuits	3	0	0	3
6.	17149S46	Environmental Science and Engineering	3	0	0	3
PRACTICALS						
7.	17152L47	Circuits Design and Simulation Laboratory	0	0	3	2
8.	17152L48	Linear Integrated Circuits Laboratory	0	0	3	2
Research Skill Development (RSD) Course						
9.	17152CRS	Research Led Seminar				1
TOTAL			21	0	6	25


SEMESTER V

Sl. No	COURSE CODE	COURSE TITLE	L	T	P	C
THEORY						
1.	17152C51	Digital Communication	3	0	0	3
2.	17152C52	Discrete-Time Signal Processing	4	0	0	4
3.	17152C53	Computer Architecture and Organization	3	0	0	3
4.	171 FE54	Free Elective - I	3	0	0	3
5.	17152C55	Communication Networks	3	0	0	3
6.	17152E56	Elective - I	3	0	0	3
PRACTICALS						
7.	17152L57	Digital Signal Processing Laboratory	0	0	3	2
8.	17152L58	Communication Systems Laboratory	0	0	3	2
9.	17152L59	Communication Networks Laboratory	0	0	3	2
Research Skill Development (RSD) Course						
10.	17152CRM	Research Methodology	3	0	0	3
TOTAL			22	0	9	28

SEMESTER VI

Sl. No	COURSE CODE	COURSE TITLE	L	T	P	C
THEORY						
1.	17152C61	Microprocessors and Microcontrollers	3	0	0	3
2.	17152C62	VLSI Design	3	0	0	3
3.	17152C63	Wireless Communication	3	0	0	3
4.	17152C64	Principles of Management	3	0	0	3
5.	17152C65	Transmission Lines and RF Systems	3	0	0	3
6.	17152E66	Elective - II	3	0	0	3
PRACTICALS						
7.	17152L61	Microprocessors and Microcontrollers Laboratory	0	0	3	2
8.	17152L62	VLSI Design Laboratory	0	0	3	2
9.	17152L63	Professional Communication	0	0	3	2
10.	17152L64	Technical Seminar	0	0	3	2
Research Skill Development (RSD) Course						
11.	17152CBB	Participation in Bounded Research				1

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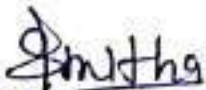
Sl. No	COURSE CODE	COURSE TITLE	L	T	P	C
TOTAL			20	0	10	26

SEMESTER VII

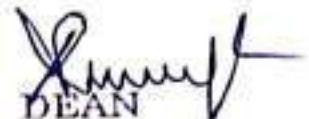
Sl. No	COURSE CODE	COURSE TITLE	L	T	P	C
THEORY						
1.	17152C71	Antennas and Microwave Engineering	3	0	0	3
2.	17152C72	Optical Communication	3	0	0	3
3.	17152C73	Embedded and Real Time Systems	3	0	0	3
4.	171 FE74	Free Elective - II	3	0	0	3
5.	17152C75	Adhoc and Wireless Sensor Networks	3	0	0	3
6.	17152E76	Elective - III	3	0	0	3
PRACTICALS						
7.	17152L77	Embedded Laboratory	0	0	3	2
8.	17152L78	Advanced Communication Laboratory	0	0	3	2
Research Skill Development (RSD) Course						
9.	17152CSR	Design/Socio-Technical Project				4
TOTAL			18	0	10	26

SEMESTER VIII

Sl. No	COURSE CODE	COURSE TITLE	L	T	P	C
THEORY						
1.	17152E81	Elective - IV	3	0	0	3
2.	17152E82	Elective - V	3	0	0	3
PRACTICALS						
3.	17152P83	Project Work	0	0	20	10
4.	17152CEC	Comprehensive Exit Course	0	0	0	2
TOTAL			6	0	20	18
TOTAL NO. OF CREDITS:						206



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LIST OF ELECTIVES

ELECTIVE - I (SEMESTER V)

Sl. No	COURSE CODE	COURSE TITLE	L	T	P	C
1.	17152E56A	Object Oriented Programming	3	0	0	3
2.	17152E56B	Medical Electronics	3	0	0	3
3.	17152E56C	Operating Systems	3	0	0	3
4.	17152E56D	Robotics and Automation	3	0	0	3
5.	17152E56E	Nano Technology and Applications	3	0	0	3
6.	17152E56F	Human Rights	3	0	0	3
7.	17152E56G	Total Quality Management	3	0	0	3
8.	17152E56H	RF Microelectronics	3	0	0	3

ELECTIVE - II (SEMESTER VI)

Sl. No	COURSE CODE	COURSE TITLE	L	T	P	C
1.	17152E66A	Cryptography and Network Security	3	0	0	3
2.	17152E66B	Advanced Digital Signal Processing	3	0	0	3
3.	17152E66C	MEMS and NEMS	3	0	0	3
4.	17152E66D	Multimedia Compression and Communication	3	0	0	3
5.	17152E66E	CMOS Analog IC Design	3	0	0	3
6.	17152E66F	Wireless Networks	3	0	0	3
7.	17152E66G	Intellectual Property Rights	3	0	0	3
8.	17152E66H	Digital Switching And Transmission	3	0	0	3

ELECTIVE - III (SEMESTER VII)

Sl. No	COURSE CODE	COURSE TITLE	L	T	P	C
1.	17152E76A	Advanced Wireless Communication	3	0	0	3
2.	17152E76B	Cognitive Radio	3	0	0	3
3.	17152E76C	Foundation Skills in Integrated Product Development	3	0	0	3
4.	17152E76D	Machine Learning Techniques	3	0	0	3
5.	17152E76E	Electronics Packaging and Testing	3	0	0	3
6.	17152E76F	Mixed Signal IC Design	3	0	0	3
7.	17152E76G	Disaster Management	3	0	0	3

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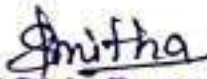
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ELECTIVE – IV (SEMESTER VIII)

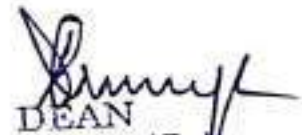
Sl. No	COURSE CODE	COURSE TITLE	L	T	P	C
1.	17152E81A	Electro Magnetic Interference and Compatibility	3	0	0	3
2.	17152E81B	Low Power SoC Design	3	0	0	3
3.	17152E81C	Photonic Networks	3	0	0	3
4.	17152E81D	Compressive Sensing	3	0	0	3
5.	17152E81E	Digital Image Processing	3	0	0	3
6.	17152E81F	Professional Ethics in Engineering	3	0	0	3

ELECTIVE - V (SEMESTER VIII)

Sl. No	COURSE CODE	COURSE TITLE	L	T	P	C
1.	17152E82A	Video Analytics	3	0	0	3
2.	17152E82B	DSP Architecture and Programming	3	0	0	3
3.	17152E82C	Satellite Communication	3	0	0	3
4.	17152E82D	Soft Computing	3	0	0	3
5.	17152E82E	Principles of Speech Processing	3	0	0	3
6.	17152E82F	Fundamentals of Nano Science	3	0	0	3



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LIST OF FREE ELECTIVES

FREE ELECTIVE – I (SEMESTER V)

Sl. No	DEPT	COURSE CODE	COURSE TITLE	L	T	P	C
1.	CSE	17150FE54A	Database Management Systems	3	0	0	3
2.		17150FE54B	Cloud Computing	3	0	0	3
3.	EEE	17153FE54A	Industrial Nano Technology	3	0	0	3
4.		17153FE54B	Energy Conservation and Management	3	0	0	3
5.	MECH	17154FE54A	Renewable Energy Sources	3	0	0	3
6.		17154FE54B	Automotive Systems	3	0	0	3
7.	CIVIL	17155FE54A	Air Pollution and Control Engineering	3	0	0	3
8.		17155FE54B	Geographic Information System	3	0	0	3

FREE ELECTIVE – II (SEMESTER VII)

Sl. No	DEPT	COURSE CODE	COURSE TITLE	L	T	P	C
1.	CSE	17150FE74A	Introduction to C Programming	3	0	0	3
2.		17150FE74B	Data Structures and Algorithms	3	0	0	3
3.	EEE	17153FE74A	Basic Circuit Theory	3	0	0	3
4.		17153FE74B	Introduction to Renewable Energy Systems	3	0	0	3
5.	MECH	17154FE74A	Industrial Safety	3	0	0	3
6.		17154FE74B	Testing of Materials	3	0	0	3
7.	CIVIL	17155FE74A	Green Building Design	3	0	0	3
8.		17155FE74B	Waste Water Treatment	3	0	0	3

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B.TECH (FULL TIME) - ECE

COURSE STRUCTURE AND CREDITS DISTRIBUTION

Semester	Core	Elective	Practical	Others	CEC	Project	RSD Course	Total
I	24	-	04	01	-	-	-	29
II	24	-	04	01	-	-	-	29
III	20	-	05	-	-	-	-	25
IV	20	-	04	-	-	-	01	25
V	13	06	06	-	-	-	03	28
VI	15	03	05	01	-	-	02	26
VII	12	06	04	-	-	-	04	26
VIII	-	06	-	-	2	10	-	18
TOTAL CGPA CREDITS								206

NON-CGPA CREDITS

Semester	Add on course	Total
I	01	01
II	01	01
III	-	-
IV	-	-
V	-	-
VI	-	-
VII	-	-
VIII	-	-
Co curricular Activities	In-plant Training , Industrial Visit , Seminars & Conferences	03
TOTAL NON-CGPA CREDITS		05

TOTAL CREDITS	
CGPA CREDITS	206
NON-CGPA CREDITS	05
TOTAL	211

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OBJECTIVES:

- To introduce radio transceiver architectures
- To understand the design issues in CMOS LNAs, Mixers, Oscillators, PLLs, Synthesizers and Power Amplifiers.

UNIT I TRANSCEIVER ARCHITECTURES 9

Heterodyne and Homodyne architectures, Discrete and CMOS realization passive components for RF, Impedance Matching, Distortion, IIP3 and Blocking Effects, Noise Figure, Noise matching conditions. Friis Formula for cascaded blocks.

UNIT II CMOS LNAs AND MIXERS 9

Noise Figure of and impedance matching issues CS, CG and differential LNAs, Passive mixers and conversion loss, Active mixers, Gilbert cells, linearity and Noise Figure of mixers.

UNIT III OSCILLATORS 9

Negative transconductance, nonlinearity and Differential LC tuned oscillators, Ring oscillators and Colpitts oscillator, Quadrature oscillators–Phase noise.

UNIT IV PLLS AND SYNTHESIZERS 9

Phase Detectors, charge pumps and their transfer functions, Synthesizers based on first, second and third order PLLs and stability issues, Introduction to integer and fractional N synthesizers.

UNIT V POWER AMPLIFIERS 9

Class A, B, C, D, E, F and AB power amplifiers, Linearization and impedance matching issues of power amplifiers.

TOTAL : 45 PERIODS**COURSE OUTCOMES:**

The student who undergoes this course will be able to

- CO1: Translate the top level wireless communications system specifications into block level specifications of the RF transceiver.
- CO2: Carry out transistor level design of the entire RF transceiver.
- CO3: Design and analyze CMOS Lnas, mixers, oscillators, plls, synthesizers and power amplifiers.

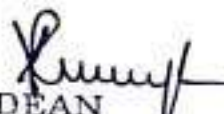
TEXT BOOKS:

1. B. Razavi, "RF Microelectronics", Pearson Education, 2nd Edition, 2012.
2. Thomas Lee, "The Design of CMOS Radio Frequency Integrated Circuits", Cambridge University Press, 2nd Edition, 2004

REFERENCES:

1. B. Razavi, "Design of Analog CMOS Integrated Circuits", McGraw Hill, 2001.
2. Recorded Lecture Notes available at <http://www.ec.iitm.ac.in/~ani/ee6240/>

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OBJECTIVES:

- To introduce the relevance of this course to the existing technology through demonstrations, case studies, simulations, contributions of scientist, national/international policies with a futuristic vision along with socio-economic impact and issues
- To introduce different types of signaling in digital telephony
- To introduce various transmission schemes for telephony and broadband
- To introduce modeling and analysis techniques for data transmission

UNIT I INTRODUCTION 9

Overview of existing Voice, Data and Multimedia Networks and Services; Review of Basic Communication principles; Synchronous and Asynchronous transmission, Line Codes

UNIT II TRUNK TRANSMISSION 9

Multiplexing & Framing - types and standards; Trunk signaling; Optical Transmission-line codes and Muxing: SONET/SDH; ATM; Microwave and Satellite Systems.

UNIT III LOCAL LOOP TRANSMISSION 9

The Analog Local Loop; ISDN local loop; DSL and ADSL; Wireless Local Loop; Fiber in the loop; Mobile and Satellite Phone local loop.

UNIT IV SWITCHING 9

Evolution; Space switching, Time switching and Combination Switching; Blocking and Delay characteristics; Message, Packet and ATM switching; Advances in switching techniques – shared memory fast packet switches, shared medium fast packet switches and space division fast packet switches, Photonic switching - Optical TDM, WDM.

UNIT V TELETRAFFIC ENGINEERING 9

Telecom Network Modeling; Arrival Process; Network Blocking performance; Delay Networks-Queuing system analysis and delay performance.

TOTAL : 45 PERIODS**COURSE OUTCOMES:**

- CO1: Ability to comprehend and appreciate the significance and role of this course in the present contemporary world.
- CO2: Ability to understand the different type of signaling, transmission schemes and switching techniques used in digital telephony.
- CO3: Ability to model and analyze the different techniques for data transmission.

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TEXT BOOKS:

1. J. Bellamy, "Digital Telephony", John Wiley, 3rd Edition, 2003.
2. JE Flood, "Telecommunications Switching, Traffic and Networks", Pearson, 2005.

REFERENCES:

1. R.A.Thompson, "Telephone switching Systems", Artech House Publishers, 2000.
2. W. Stalling, "Data and Computer Communications", Prentice Hall, 1993.
3. T. N. Saadawi, M.H.Ammar, A.E.Hakeem, "Fundamentals of Telecommunication Networks", Wiley Interscience, 1994.
4. W.D. Reeve, "Subscriber Loop Signalling and Transmission Hand book", IEEE PressTelecomm Handbook Series, 1995.
5. Tarmo Anttalainen, "Introduction to Telecommunication Network Engineering", Artech House, 2nd Edition, 2003.
6. T. Viswanathan, "Telecommunication Switching Systems", Prentice-Hall, 1992.

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IOT With Node MCU Training Syllabus

Module 1 – IOT Introduction

- Concepts and Definitions of The Internet of Things (IoT)
- History of IOT
- Requirements, Functionalists, and structure of IOT
- IoT enabling technologies
- IoT Architecture
- The major component of IOT (Hardware & Software)
- IoT communication and networking protocols, Role of wired and wireless communication.
- IoT services and applications.
- IoT Standards, Connectivity

Module 2 – IOT Case Studies

- Project Case Study
- Project Requirements (hardware & software)
- How to Design IOT Applications (Web, Mobile, Device)
- Projects on every technology (At least 4 Projects)
- Data Generator

Module 3 – IOT Data Acquisition & Platforms

- Micro Controllers (Arduino uno/mega2560, Raspberry-Pi, ARM), Real-time systems, and embedded software
- OS and Drivers (End Device Program)
- Hardware & Software Requirements

Module 4 – IOT Data Communication

- How to transfer data by Wireless / Wired connectivity
- Ipv4/Ipv6, Ethernet/GigE
- MIPI, M-PHY, UniPro, SPMI, BIF, SuperSpeed USB Inter-Chip (SSIC). Mobile PCIe (M-PCIe) and SPI
- GSM , 2g ,3g ,4g & 5g
- IEEE 802.15.4, IEEE 802.15.4e, 802.11ah
- Relay Access Point (AP)
- Grouping of station
- Target Wake Time (TWT)

Module 5 – IOT Data Storage & Retrieval

- Overview and Role of Storage in Cloud / Server /Inhouse Storage
- Databases Connectivity with IOT and uses
- Case Study of NoSql / NewSql
- Case Study over Cloud Services And Administration
- Study Of Big Data & Hadoop Platforms


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Module 6 – IOT Data Analytics & Visualization

- Analysis Of data using the Ipython Module
- Visualization and interpretation of Data
- Data Cleaning in IoT

Module 7 – IOT Security

- Attack, Defense, and Network Robustness of Internet of Things
- Malware Propagation and Control in the Internet of Things
- Privacy Preservation Data Dissemination
- Trust and Trust Models for the IoT
- Authentication in IoT
- Computational Security for the IoT
- Security Protocols for IoT Access Networks
- Security Testing

Module 8 – IOT Product Development & Testing with Project

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Course Name: Robotics And Its Application	
Module-1	
IntroductionToRobotics: Introduction to Robotics and Automation, laws of robot, brief history of robotics, basic components of robot, robot specifications, classification of robots, human system and robotics, safety measures in robotics, social impact, Robotics market and the future prospects, advantages and disadvantages of robots.	
Module-2	
Robot Anatomy And Motion Analysis: Anatomy of a Robot, Robot configurations: polar, cylindrical, Cartesian, and jointed arm configurations, Robot links and joints, Degrees of freedom: types of movements, vertical, radial and rotational traverse, roll, pitch and yaw, Work volume/envelope, Robot kinematics: Introduction to direct and inverse kinematics, transformations and rotation matrix.	
Module-3	
Robot Drives And End Effectors: Robot drive systems: Hydraulic, Pneumatic and Electric drive systems, classification of end effectors, mechanical grippers, vacuum grippers, magnetic grippers, adhesive gripper, gripper force analysis and gripper design, 1 DoF, 2 DoF, multiple degrees of freedom robot hand, tools as end effectors, Robot control types: limited sequence control, point-to-point control, playback with continuous path control, and intelligent control.	
Module-4	
Path Planning: Definition-Joint space technique, Use of P-degree polynomial-Cubic, polynomial-Cartesian space technique, parametric descriptions, straight line and circular paths, position and orientation planning.	
Module-5	
Robotics Applications: Material Handling: pick and place, palletizing and depalletizing, machining loading and unloading, welding & assembly, Medical, agricultural and space applications, unmanned vehicles: ground, Ariel and underwater applications, robotic for computer integrated manufacturing. Types of robots: Manipulator, Legged robot, wheeled robot, aerial robots, Industrial robots, Humanoids, Robots, Autonomous robots, and Swarm robots	

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Course Contents-PCB DESIGN AND FABRICATION

Unit-1: Tutorials and Practice Exercises

45Hours

Sl. No.	Topic/Exercises
1	Introduction to PCB <ul style="list-style-type: none"> • Definition and Need/Relevance of PCB • Background and History of PCB • Types of PCB • Classes of PCB Design • Terminology in PCB Design • Different Electronic design automation (EDA) tools and comparison.

2	PCB Design Process <ul style="list-style-type: none"> • PCB Design Flow, Placement and routing • Steps involved in layout design • Artwork generation Methods - manual and CAD • General design factor for digital and analog circuits • Layout and Artwork making for Single-side, double-side and Multi-layer Boards. • Design for manufacturability • Design-specification standards
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3	Introduction to PCB Fabrication & Assembly <ul style="list-style-type: none"> • Steps involved in fabrication of PCB. • PCB Fabrication techniques-single, double sided and multilayer • Etching: chemical principles and mechanisms • Post operations- stripping, black oxide coating and solder masking • PCB component assembly processes
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4	Transmission lines and crosstalk <ul style="list-style-type: none"> • Transmission Line: Transmission lines and its effects Significance of Transmission line in Board design Types of Transmission lines. • Crosstalk: The crosstalk in transmission lines Crosstalk control in PCB design parts, planes, tracks, connectors, terminations Minimization of crosstalk. • Thermal issues: Thermal mapping of design
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Unit – 2: Graded Exercises

Part-A: Design PCB (schematic and Layout) for following exercises.

1	Regulator circuit using 7805.
2	Inverting Amplifier or Summing Amplifier using op-amp
3	Full-wave Rectifier
4	Astable or Monostable multivibrator using IC555
5	RC Phase-shift or Wein-bridge Oscillator using transistor.
6	Full-Adder using half-adders.
7	4 bit binary /MOD N counter using D-Flip flops.
8	One open-ended (analog/ digital/mixed circuit) experiments of similar nature and magnitude of the above are to be assigned by the teacher (Student is expected to solve and execute/simulate independently).
9-11	Design a 8051 Development board having <ul style="list-style-type: none">• Power section consisting of IC7805, capacitor, resistor, headers, LED• Serial communication section consisting of MAX 232, Capacitors, DB9 connector, Jumper, LEDs• Reset & Input/ output sections consisting of 89C51 Microcontroller, Electrolytic Capacitor, Resistor, Jumper, Crystal Oscillator, Capacitors Note: For SEE any one section among three shall be considered as one exercise.

Tools and materials required for PCB fabrication:

1. Open source EDA Tool KiCad.
2. Single-sided copper clad sheet.
3. Diluted Acidic solution for copper etching purpose with plastic tray.
4. Tapes and pads for layout design of different dimensions.
5. Hand drilling/Power drilling machine.
6. Tool kit (tong, hand gloves etc.)

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Unit – 3: Project/Student Activities

1	<p>Design and fabricate PCB for any one project, mount the components and assemble in a cabinet: Some of the projects are listed below which is just a guideline for selecting the project. Students can also select any other project with the advice of his teacher.</p> <p>List of sample circuit:</p> <ol style="list-style-type: none"> 1. Touch plate switches – transistorized or 555 based 2. Doorbell/cordless bell 3. Clapping switch and IR switch 4. Blinkers 5. Cell charger, battery charger, mobile charger 6. Fire/smoke/intruder alarm 7. Liquid level controller 8. Counters 9. Audio amplifiers
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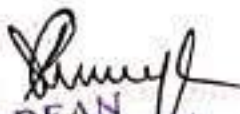
Execution Mode

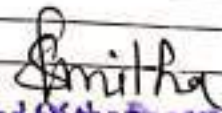
1. Every student should perform Project activity independently as assigned by the teacher based on interest of the student. Student can also choose any other similar activity with a prior approval from the concerned teacher.
2. Project activities shall be carried out throughout the semester and present the project report at the end of the semester.
3. Report-size shall be qualitative and not to exceed 6 pages;
4. Each of the activity can be carried out off-class; however, demonstration/presentation should be done during laboratory sessions.
5. Assessment shall be made based on quality of activity, presentation/demonstration and report.
6. Assessment is made based on quality of work as prescribed by the following rubrics table.

Institutional Activity

The following are suggested institutional activities, to be carried out at least one during the semester. The course teacher/coordinator is expected to maintain the relevant record (Containing, Activity name, Resource persons and their details, duration, venue, student feedback, etc) pertaining to Institutional activities

Sl. No.	Activity
1	Organize seminar on free-open source EDA software
2	Conduct quiz on PCB Design fundamentals.


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 Department of Electronics and
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COURSE CONTENT –DESIGN OF EMBEDDED REAL TIME SYSTEMS

Module 1 – INTRODUCTION TO EMBEDDED SYSTEM, ASICS AND ASIPS

An embedded system is a combination of computer hardware and software designed for a specific function. Embedded systems may also function within a larger system. The systems can be programmable or have a fixed functionality.

Module 2 – EMBEDDED SYSTEM DESIGN USING ARDUINO

Embedded system basically is a computer system that is designed to pull off a few or one specific function, more often than not in real-time computing constraints. "ARDUNIO" most widely used technique of embedded systems. An Arduino is an assembled board of Atmel 8-bit AVR microcontroller with additional components to facilitate programming. An important aspect of the Arduino is the standardized way in which the connectors are exposed, providing a facility to the board to get connected to a variety of interchangeable add-on modules known as shields. The hardware consists of an open-source hardware board designed around an 8-bit Atmel AVR microcontroller. The software consists of a standard programming language compiler and a boot loader that executes on the microcontroller.

Module 3 – EMBEDDED SYSTEM DESIGN USING RASPBERRY PI

The Raspberry Pi has received a lot of attention since its release in early 2012. It was designed to be a simple, low-cost device for use in schools to encourage interest in computers and computing. Whether that goal has been

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Department of
Postgraduate
School of
Engineering

Sharma

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achieved is perhaps still open to debate, but what is clear is that the device has gained a significant following in the hobbyist and DIY world.

There is a strong, active community and support from the Raspberry Pi foundation focused on their Raspian Linux distribution, which is a Debian derivative with support and optimisation for the Raspberry Pi hardware.

Module 4 – EMBEDDED SYSTEM DESIGN USING

An embedded real-time operating system is the software kernel of high performance smart phone. This paper presents an embedded real-time operating system named SPOS (smart phone operating system) whose purpose is to hold key technique of smart phone and enhance the Competence of production. Cluing in particularities of smart phone operating system, the paper interprets detailed the designing ideas of system architecture, multitasking kernel, wireless application interface and application framework of SPOS.

Module 5 –applications of embedded systems

Embedded systems are commonly found in consumer, industrial, automotive, home appliances, medical, telecommunication, commercial, aerospace and military applications, ...

Consumer electronics include MP3 players, television sets, mobile phones, video game consoles, digital cameras, GPS receivers, and printers.

Key concepts include:


- Sophisticated Functionality ...
- Real-Time Operation. ...
- Low Manufacturing Cost. ...
- Processor and Memory. ...
- Tight Design Constraint.
- Based on Performance and Functional Requirements. ...
- Based on the Performance of the Microcontroller.

ELIGIBILITY

B.Tech –ECE & EEE students shall be eligible for the admission to the course.

COURSE DURATION: 45 Hours

Monday:	4.00-5.30 P.M
Wednesday	4.00-5.30 P.M
Friday:	4.00-5.30 P.M


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VALLAM, THANJAVUR-613403

**DEPARTMENT OF ELECTRICAL AND
ELECTRONICS ENGINEERING**

BOARD OF STUDIES

CIRCULAR & MINUTES OF MEETING
2019-2020

BOARD OF STUDIES MEETING

CIRCULAR

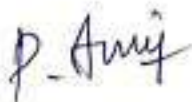
21.06.2019

The BOS Meeting is scheduled on 25.06.2019 at 11.00 am in the Ampere Hall of 'A' Block at PRIST Deemed to be University Vallam Campus under the Chairmanship of Prof. Dr. P.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).
4. To introduce the syllabus contents of two newly added Elective courses.
5. To introduce the syllabus contents of newly added Value added courses.
6. To discuss upon the Programme Educational Objectives (PEOs), Programme Outcomes (POs) and Programme Specific Outcomes (PSOs) of B.Tech (FT).
7. To recommend the panel of Examiners for B.Tech(FT).

HOD/ EEE



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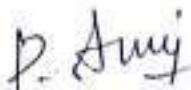
MINUTES OF THE MEETING OF THE BOARD OF STUDIES (BOS)

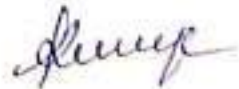
Board: EEE

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	11
Date and Time	25.06.2019 @ 11.00 am
Venue	Ampere 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).
4.	To introduce the syllabus contents of newly added Elective courses.
5.	To introduce the syllabus contents of newly added Value added courses.
6.	To discuss upon the Programme Educational Objectives (PEOs), Programme Outcomes (POs) and Programme Specific Outcomes (PSOs) of B.Tech (FT).
7.	To recommend the panel of Examiners for B.Tech (FT).
8.	Any other matter


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MINUTES OF THE BOARD OF STUDIES MEETING

Board: EEE

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 and Action taken on 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: The chairman confirmed the previous meeting minutes of BOS and discussed the action taken on the previous BOS Meeting Minutes.
Agendum 2: Scrutiny of stakeholder's feedback on existing curriculum and syllabi.
Discussion: To scrutinize the abstract of stakeholders feedback on existing curriculum and syllabi for B.Tech-EEE (Full 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) and resolved to continue with the existing syllabus.
Agendum 3: Introduction newly added Elective courses.
Discussion: To introduce the syllabus content for the following newly added Elective courses. i) 17153E81C- Power Systems Dynamics. ii) 17153E64E- Modern Power Converters.
Resolution: The members of the Board scrutinized the syllabus contents of newly added Elective courses and resolved to introduce the same.
Agendum 5: To introduce the syllabus contents of newly added Value added courses.
Discussion: To introduce the syllabus content for the following newly added value added courses. 1. 195153tvc - Testing Of Vlsi Circuits And Design. 2. 185153ps- PLC and SCADA. 3. 185153mcc- MATLAB For Electrical Engineers. 4. 185153rto- Real Time Operating Systems. 5. 195153iot - Design Of Project Using IOT. 6. 195153toe- Assembling And Testing Of Electrical. 7. 195153plc- Automation Using PLC. 8. 195153pcb - PCB Design And Component Testing.
Resolution: The members of the Board scrutinized the syllabus contents of newly added value added courses and resolved to introduce the same.

(POs) and Programme Specific Outcomes (PSOs) of B.Tech (FT).
Discussion: To discuss upon the Programme Educational Objectives (PEOs), Programme Outcomes (POs) and Programme Specific Outcomes (PSOs) of B.Tech (FT).
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).
Agendum 7: Recommend the panel of Examiners for B.Tech (FT).
Discussion: To recommend the panel of Examiners for B.Tech (FT).
Resolution: The members of the board also scrutinized the panel of examiners and recommended to continue with the same panel of examiners for B.Tech (FT).

The chairman of Board of Studies (BOS) thanked all the members for their active participation and cordially invited them for the next meeting.

Inclusion of Additional elective Courses in B.TECH (FT) -(R-2019)

1. 17153E81C -Power Systems Dynamics
2. 17153E64E -Modern Power Converters.

Inclusion of Additional value added Courses in B.TECH (FT)

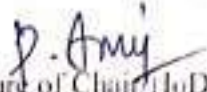
1. 1951531VC - Testing Of Vlsi Circuits And Design.
2. 185153PS - PLC and SCADA.
3. 185153MLE- MATLAB For Electrical Engineers.
4. 185153RTG- Real Time Operating Systems.
5. 195153IOT - Design Of Project Using IOT.
6. 195153TOE- Assembling And Testing Of Electrical.
7. 195153PLC- Automation Using PLC.
8. 195153PCB - PCB Design And Component Testing

Dept: EEE

School: Engineering and Technology

BOS Chairman Name:

Date:


 Signature of Chair HoD:
Head of the Department
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 Signature of Dean
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MINUTES OF THE BOARD OF STUDIES MEETING

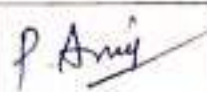

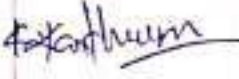
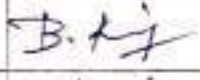
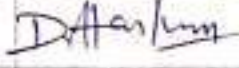



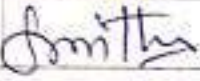
ATTENDANCE OF THE [----- (Thirteenth)] BOARD OF STUDIES MEETING
Board: EEE

Date: 27-06-2023

Time: 11.00 am

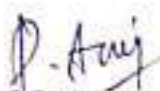
Venue: Gallery Hall, 'A' Block

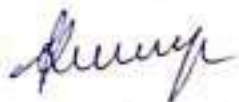
The following members were present for the Board of Studies meeting.

S.No.	Name/Degree/Designation	Institute/Organization/ Full address	Online/ Physical	Signature
1.	Prof. Dr. P. Avirajamanjula Chairman	Dept of EEE, PRIST DU	Physical	
2.	Dr. M.P. Selvan, Professor, NIT - Trichy <u>External Members</u>	National Institute of Technology, Tiruchirappalli.	Physical	
3.	Mr. K. Kannadasan, AEE/TNEB, <u>External Members</u>	AEE / TNEB, 230KV SS, Thirukanurpatti, Vallam, Thanjavur.	Physical	
4.	Mr. B. Kunjithapatham Associate Professor	Dept of EEE, PRIST DU	Physical	
5.	Mr. D. Hariharan, Assistant Professor	Dept of EEE, PRIST DU	Physical	
6.	Mr. R. Elangovan, Assistant Professor	Dept of EEE, PRIST DU	Physical	
7.	Mrs. R. Prasanna Devi, Assistant Professor	Dept of EEE, PRIST DU	Physical	
8.	Mrs. M. R. Geetha Assistant Professor	Dept of EEE, PRIST DU	Physical	
9.	Dr. Smitha Lisa Peter, Professor	Dept of ECE, PRIST DU	Physical	

Date: 27/06/23


BOS Chairman/HOD


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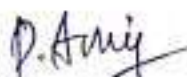

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SEMESTER I

S.No	Course Code	Course Title	L	T	P	C
1	17147S11	Communicative English	5	1	0	4
2	17148S12	Engineering Mathematics - I	5	1	0	4
3	17149S13	Engineering Physics	5	1	0	4
4	17149S14	Engineering Chemistry	5	1	0	4
5	17154S15	Engineering Graphics	5	1	0	4
6	17150S16	Problem Solving and Python programming	5	1	0	4
7	17150L17	Problem Solving and Python Programming Laboratory	0	0	3	2
8	17149L18	Physics and Chemistry Laboratory	0	0	3	2
9	171VEA19	Value Education				1
TOTAL CREDITS						29

SEMESTER - II

S.No	Course Code	Course Name	L	T	P	C
1	17147S21	Technical English	5	1	0	4
2	17148S22A	Engineering Mathematics - II	5	1	0	4
3	17149S23B	Physics for Electronics Engineering	5	1	0	4
4	17149S24A	Environmental Science and Engineering	5	1	0	4
5	17153S25C	Circuit Theory	5	1	0	4
6	17154S26C	Basic Civil and Mechanical Engineering	5	1	0	4
7	17154L27	Engineering Practices Laboratory	0	0	3	2
8	17153L28C	Electric Circuits Laboratory	0	0	3	2
9	171ICA29	Fundamentals of Indian Constitution and Economy				1
TOTAL CREDITS						29



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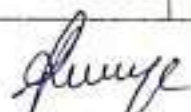
SEMESTER III

S.No	Course Code	Course Name	L	T	P	C
1	17149S31C	Transforms and Partial Differential Equations	3	1	0	4
2	17153C32	Digital Logic Circuits	3	1	0	3
3	17153C33	Electromagnetic Theory	2	2	0	3
4	17153C34	Electrical Machines - I	2	2	0	3
5	17153C35	Electron Devices and Circuits	3	0	0	3
6	17153C36	Power Plant Engineering	3	0	0	3
7	17153L37	Electronics Laboratory	0	0	3	2
8	17153L38	Electrical Machines Laboratory - I	0	0	3	2
TOTAL CREDITS						23

SEMESTER IV

S.No	Course Code	Course Name	L	T	P	C
1	17149C41C	Numerical Methods	4	0	0	4
2	17153C42	Electrical Machines - II	2	2	0	3
3	17153C43	Transmission and Distribution	3	0	0	3
4	17153C44	Measurements and Instrumentation	3	0	0	3
5	17153C45	Linear Integrated Circuits and Applications	3	0	0	3
6	17153C46	Control Systems	3	2	0	4
7	17153L47	Electrical Machines Laboratory - II	0	0	4	2
8	17153L48	Linear and Digital Integrated Circuits Laboratory	0	0	4	2
9	17153L49	Technical Seminar	0	0	2	1
10	17153CRS	Research Led Seminar	0	0	0	1
TOTAL CREDITS						26


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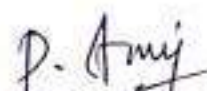

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SEMESTER - V

S.No	Course Code	Course Name	L	T	P	C
1	17153C51	Power System Analysis	3	0	0	3
2	17153C52	Microprocessors and Microcontrollers	3	0	0	3
3	17153C53	Power Electronics	3	0	0	3
4	17153FE54	Free Elective - I*	3	0	0	3
5	17153C55	Digital Signal Processing	2	2	0	3
6	17153C56	Object Oriented Programming	3	0	0	3
7	17153L57	Control and Instrumentation Laboratory	0	0	3	2
8	17153L58	Object Oriented Programming Laboratory	0	0	3	2
9	17153L59	Professional Communication	0	0	2	1
10	17153CRM	Research Methodology	3	0	0	3
TOTAL CREDITS						26

SEMESTER - VI

S.No	Course Code	Course Name	L	T	P	C
1	17153C61	Solid State Drives	3	0	0	3
2	17153C62	Protection and Switchgear	3	0	0	3
3	17153C63	Embedded Systems	3	0	0	3
4	17153E64	Elective - I	3	0	0	3
5	17153E65	Elective - II	3	0	0	3
6	17153L66	Power Electronics and Drives Laboratory	0	0	3	2
7	17153L67	Microprocessors and Microcontrollers Laboratory	0	0	3	2
8	17153MP68	Mini Project	0	0	4	2
9	17153CBR	Participation in Bounded Research	0	0	0	2
TOTAL CREDITS						23


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SEMESTER - VII

S.No	Course Code	Course Name	L	T	P	C
1	17153C71	High Voltage Engineering	3	0	0	3
2	17153C72	Power System Operation and Control	3	0	0	3
3	17153C73	Renewable Energy Systems	3	0	0	3
4	17153E74	Free Elective -II	3	0	0	3
5	17153E75	Elective - III	3	0	0	3
6	17153E76	Elective - IV	3	0	0	3
7	17153L77	Power System Simulation Laboratory	0	0	3	2
8	17153L78	Renewable Energy Systems Laboratory	0	0	3	2
9	17153CSR	Participation in Scaffolded Research (Design / Socio Technical Project)	0	0	0	4
TOTAL CREDITS						26

SEMESTER - VIII

S.No	Course Code	Course Name	L	T	P	C
1.	17153E81	Elective - V	3	0	0	3
2.	17153E82	Elective - VI	3	0	0	3
3.	17153P81	Project Work	-	-	-	12
4.	17153CEC	Comprehensive Exit Course				2
TOTAL CREDITS						20

P. Anuj

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Anuj

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LIST OF ELECTIVES

ELECTIVE – I (VI SEMESTER)

S.No	Course Code	Course Name	L	T	P	C
1.	17153E64A	Advanced Control System	2	2	0	3
2.	17153E64B	Visual Languages and Applications	3	0	0	3
3.	17153E64C	Design of Electrical Apparatus	3	0	0	3
4.	17153E64D	Power Systems Stability	3	0	0	3
5.	17153E64E	Modern Power Converters	3	0	0	3
6.	17153E64F	Intellectual Property Rights	3	0	0	3


ELECTIVE – II (VI SEMESTER)

S.No	Course Code	Course Name	L	T	P	C
1.	17153E65A	Principles of Robotics	3	0	0	3
2.	17153E65B	Special Electrical Machines	3	0	0	3
3.	17153E65C	Power Quality	3	0	0	3
4.	17153E65D	EHVAC Transmission	3	0	0	3
5.	17153E65E	Communication Engineering	3	0	0	3

ELECTIVE – III (VII SEMESTER)

S.No	Course Code	Course Name	L	T	P	C
1	17153E75A	Disaster Management	3	0	0	3
2	17153E75B	Human Rights	3	0	0	3
3	17153E75C	Operations Research	3	0	0	3
4	17153E75D	Probability and Statistics	3	0	0	3
5	17153E75E	Fiber Optics and Laser Instrumentation	3	0	0	3


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ELECTIVE – IV (VII SEMESTER)

S.No	Course Code	Course Name	L	T	P	C
1	17153E76A	System Identification and Adaptive Control	3	0	0	3
2	17153E76B	Computer Architecture	3	0	0	3
3	17153E76C	Control of Electrical Drives	3	0	0	3
4	17153E76D	VLSI Design	3	0	0	3
5	17153E76E	Power Systems Transients	3	0	0	3
6	17153E76F	Total Quality Management	3	0	0	3

ELECTIVE – V (VIII SEMESTER)

S.No	Course Code	Course Name	L	T	P	C
1	17153E81A	Flexible AC Transmission Systems	3	0	0	3
2	17153E81B	Soft Computing Techniques	3	0	0	3
3	17153E81C	Power Systems Dynamics	3	0	0	3
4	17153E81D	SMPS and UPS	3	0	0	3
5	17153E81E	Electric Energy Generation, Utilization and Conservation	3	0	0	3
6	17153E81F	Professional Ethics in Engineering	3	0	0	3
7	17153E81G	Principles of Management	3	0	0	3

ELECTIVE – VI (VIII SEMESTER)

S.No	Course Code	Course Name	L	T	P	C
1	17153E82A	Energy Management and Auditing	3	0	0	3
2	17153E82B	Data Structures	3	0	0	3
3	17153E82C	High Voltage Direct Current Transmission	3	0	0	3
4	17153E82D	Microcontroller Based System Design	3	0	0	3
5	17153E82E	Smart Grid	3	0	0	3
6	17153E82F	Biomedical Instrumentation	3	0	0	3
7	17153E82G	Fundamentals of Nano Science	3	0	0	3

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FREE ELECTIVE (V SEM)

S.No	Course Code	Course Name	L	T	P	C
1	17150FE54A	Database Management System	3	0	0	3
2	17152FE54A	Basics of Biomedical Instrumentation	3	0	0	3
3	17154FE54A	Renewable Energy Sources	3	0	0	3
4	17155FE54A	Air Pollution and Control Engineering	3	0	0	3
5	17150FE54B	Cloud computing	3	0	0	3
6	17152FE54B	Sensors and Transducers	3	0	0	3
7	17154FE54B	Automatic System	3	0	0	3
8	17155FE54B	Geographic Information System	3	0	0	3

FREE ELECTIVE (VII SEM)

S.No	Course Code	Course Name	L	T	P	C
1	17150FE74A	Introduction to C Programming	3	0	0	3
2	17152FE74A	Robotics	3	0	0	3
3	17154FE74A	Industrial safety	3	0	0	3
4	17155FE74A	Green Building Design	3	0	0	3
5	17150FE74B	Datastructures and Algorithms	3	0	0	3
6	17152FE74B	Electronic Devices	3	0	0	3
7	17154FE74B	Testing of Materials	3	0	0	3
8	17155FE74B	Waste water Treatment	3	0	0	3

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CREDITS DISTRIBUTION

CGPA CREDITS

Semester	Core	Elective	Free Elective	Comprehensive Exit Course	RSD Course	Others	Total
I	28	-	-	-	-	-	28
II	28	-	-	-	-	-	28
III	23	-	-	-	-	-	23
IV	25	-	-	-	01	-	26
V	20	-	03	-	03	-	26
VI	15	06	-	-	02	-	23
VII	13	06	03	-	04	-	26
VIII	12	06	-	02	-	-	20
Over ALL Credits							200

NON CGPA CREDITS

Semester	Add on course	Total
I	01	01
II	01	01
III	-	-
IV	-	-
V	-	-
VI	-	-
VII	-	-
VIII	-	-
Co curricular Activities	In-plant Training , Industrial Visit , Seminars & Conferences	03
TOTAL NON-CGPA CREDITS		05

TOTAL CREDITS	
CGPA CREDITS	200
NON-CGPA CREDITS	05
TOTAL	205

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NEWLY ADDED ELECTIVE COURSE SYLLABUS

MODERN POWER CONVERTERS

OBJECTIVES: To impart knowledge about the following topics:

- Switched mode power supplies
- Matrix Converter
- Soft switched converters

OUTCOMES:

- Ability to suggest converters for AC-DC conversion and SMPS

LEVEL I: SWITCHED MODE POWER SUPPLIES (SMPS)

DC Power supplies and Classification; Switched mode dc power supplies - with and without isolation, single and multiple outputs; Closed loop control and regulation; Design examples on converter and closed loop performance.

LEVEL II: AC-DC CONVERTERS

Switched mode AC-DC converters. Synchronous rectification - single and three phase topologies - switching techniques - high input power factor - Reduced input current harmonic distortion, improved efficiency, with and without input-output isolation. Performance indices design examples

LEVEL III: DC-AC CONVERTERS

Multi-level Inversion - concept, classification of multilevel inverters, Principle of operation, main features and analysis of Diode clamped, Flying capacitor and cascaded multilevel inverters; Modulation schemes.

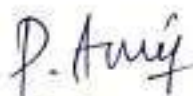
LEVEL IV: AC-AC CONVERTERS WITH AND WITHOUT DC LINK

Matrix converters. Basic topology of matrix converter; Commutation - current path; Modulation techniques - scalar modulation, indirect modulation; Matrix converter as only AC-DC converter; AC-AC converter with DC link - topologies and operation - with and without resonance link - converter with dc link converter; Performance comparison with matrix converter with DC link converters.

LEVEL V: SOFT-SWITCHING POWER CONVERTERS

Soft switching techniques. ZVS, ZCS, quasi resonance operation; Performance comparison hard switched and soft switched converters. AC-DC converter, DC-DC converter, DC-AC converter.; Resonant DC power supplies.

TOTAL : 45 PERIODS



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POWER SYSTEM DYNAMICS

OBJECTIVES: To impart knowledge about the following topics:

- Basics of dynamics and stability problems
- Modeling of synchronous machines
- Excitation system and speed-governing controllers.
- Small signal stability of a single-machine infinite bus system with excitation system and power system stabilizer.
- Transient stability simulation of multi machine power system

OBJECTIVES: To impart knowledge about the following topics:

- Basics of dynamics and stability problems
- Modeling of synchronous machines
- Excitation system and speed-governing controllers.
- Small signal stability of a single-machine infinite bus system with excitation system and power system stabilizer.
- Transient stability simulation of multi machine power system.

LEVEL I INTRODUCTION

Basics of system dynamics – numerical techniques – introduction to software packages to study the responses. Concept and importance of power system stability in the operation and design - distinction between transient and dynamic stability - complexity of stability problem in large system - necessity for reduced models - stability of interconnected systems.

LEVEL II SYNCHRONOUS MACHINE MODELLING

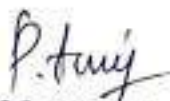
Synchronous machine - flux linkage equations - Park's transformation - per unit conversion - normalizing the equations - equivalent circuit - current space model - flux linkage state space model. Sub-transient and transient inductances - time constants. Simplified models (one axis and constant flux linkage) - steady state equations and phasor diagrams.

LEVEL III MACHINE CONTROLLERS

Exciter and voltage regulators - function and types of excitation systems - typical excitation system configuration - block diagram and state space representation of IEEE type 1 excitation system - saturation function - stabilizing circuit. Function of speed governing systems - block diagram and state space representation of IEEE mechanical hydraulic governor and electrical hydraulic governors for hydro turbines and steam turbines.

LEVEL IV TRANSIENT STABILITY

State equation for multi machine system with one axis model and simulation – modelling of multi machine power system with one axis machine model including excitation system and speed governing system and simulation using R-K method of fourth order (Gill's technique) for transient stability analysis - power system stabilizer. For all simulations, the algorithm and flow chart have to be discussed.



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LEVEL V DYNAMIC STABILITY

System response to small disturbances - linear model of the unregulated synchronous machine and its modes of oscillation - regulated synchronous machine - distribution of power impact - linearization of the load equation for the one machine problem - simplified linear model - effect of excitation on dynamic stability - approximate system representation- Supplementary stabilizing signals- dynamic performance measure - small signal performance measures.

TOTAL PERIOD :45 PERIODS

VALUE ADDED COURSE SYLLABUS

195153TYC- TESTING OF VLSI CIRCUITS AND DESIGN

Course outcome:

This course is an introduction to the field of digital systems testing, which is an integral part of IC design and manufacturing. Importance of VLSI Testing, Test process and Automatic Test Equipment, Defects versus Fault models, Fault simulation, Logic simulation, Combinational Circuit Testing, Sequential Circuit Testing, Memory Testing, Design-for-Testability, Scan Design, Boundary Scan, Built-in-Self Test, Delay Test, Current Testing, VLSI Reliability, etc.

Syllabus

Session 1

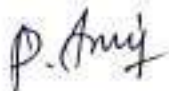
BASICS OF TESTING

- Fault models.
- Combinational Logic and fault simulation.
- Test generation for Combinational Circuits.
- Current sensing based testing.
- Fault collapsing and simulation.

Session 2

CMOS TESTING

- Testing of static and dynamic circuits.
- Fault models for diagnosis.
- Cause- effect diagnosis.
- Effect-cause diagnosis.



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Session 3

BUILT-IN SELF-TEST

- Pattern Generators
- Estimation of test length
- Test points to improve testability
- BIST methodologies
- BIST for delay fault testing

COURSE DURATION: 45 Hours

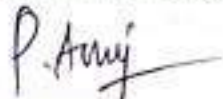
185153PS-PLC AND SCADA

OUTCOMES:

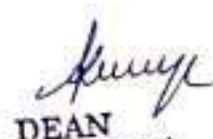
- The Most Used Guiding Force Behind an Automated Industrial Plant Is A “Programmable Logic Controller " Generally Known As A PLC.
- PLCs Along With Certain Other Necessary Ingredients Like Sensors, Motors, Actuators, Valves, Conveyors, Boilers, SCADA Systems, Computers & Many More, Makes A Real Automated Manufacturing Plant.

SESSION 1

- Presentation on Recent Trends in Industrial Automation & PLC-SCADA
- Introduction to Automation
- Why We Need Automation
- Evolution In Industrial Automation (A Brief History)
- Different Type Of Industrial Control Mechanisms)
- Introduction to PLCs
- PLC Advantages over Microcontrollers
- Area of Applications
- DATA Flow During Automation
- Motor Drives Introduction & Their Need
- Sensors Introduction & Their Need
- HMI Introduction & Its Need



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- SCADA Introduction & Its

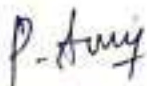
SESSION 2

- Detail study of PLC & SCADA
- PLC
- SCADA
- PLC I/Os (Basics, Wiring & Interfacing Concepts)
- Allen Bradley & Rockwell Automation's Details
- Brief Description To Input/ Output Pins Of Micrologix-1000
- Ladder Diagram Basics
- Introduction To RSLogix
- Downloading a Ladder Program in PLC Using RS Linx.
- How To Take Input from Panel
- How To Give Output To Panel
- Running First PLC Application

SESSION 3

- Hands on PLC Training Kit & SCADA Software
- Participants will perform hands on PLC training Kit which contain Allen Bradley Micrologix 1000
- PLC
- Software Used: RsLogix, RsLinx & Wonderware In Touch (SCADA)

COURSE DURATION: 45 Hours



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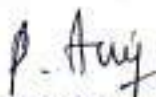
185153MEE- MATLAB FOR ELECTRICAL ENGINEERS

Outcomes:

The course focuses on how to implement complex decision flows and finite-state machines using State flow and provides a general understanding of how to accelerate the design process for closed-loop control systems using MATLAB.

- MATLAB built-in functions
- 2D and 3D plots
- Simulink modelling
- Model Based Designing
- Masks and Sub-systems,
- Lookup table editor and breakpoints
- Stateflow modelling
- Hierarchical state machines
- Parallel state machines
- Events in state machines
- Functions in state machines
- Truth tables and State transition tables
- Control systems stability analysis
- Controller implementation – P, PI, PID
- Frequency response estimation
- Simscape modelling
- Selecting solver methods
- Connecting physical signals and simulink signals

COURSE DURATION: 45 Hours



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185153RTO - REAL TIME OPERATING SYSTEMS

Level 1: Introduction To Real-Time Embedded Systems

Brief history of Real Time Systems, A brief history of Embedded Systems.

Level 2: System Resources

Resource Analysis, Real-Time Service Utility, Scheduling Classes, The Cyclic Executive, Scheduler Concepts, Preemptive Fixed Priority Scheduling Policies, Real-Time OS, Thread Safe Recurrent Functions.

Level 3: Processing

Preemptive Fixed-Priority Policy, Feasibility, Rate Monotonic least upper bound, Necessary and Sufficient feasibility, Deadline – Monotonic Policy, Dynamic priority policies.

Level 4: I/O Resources, Memory

I/O Resources: Worst-case Execution time, Intermediate I/O, Execution efficiency, I/O Architecture, Memory: Physical hierarchy, Capacity and allocation, Shared Memory, ECC Memories, Flash file systems.

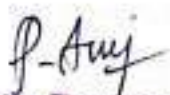
Level 5: Multi Resource Services Soft Real-Time Services

Multi resource Services: Blocking, Deadlock and livelock, Critical sections to protect Shared resources, priority inversion, Soft Real-Time Services: Missed Deadlines, QOS, Alternatives to rate monotonic policy, mixed hard and soft real-time services.

COURSE OUTCOMES:

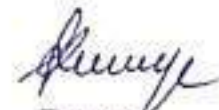
- Analyze basic concepts of operating system and their structures.
- Analyze various issues related to inter process communication like process scheduling.
- Resource management and deadlocks.
- Interpret the issues and challenges of memory management.
- Synthesize the concepts of I/O management, file system implementation and problems Related to security and protection.

COURSE DURATION : 45 Hrs



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195153 IOT- DESIGN OF PROJECT USING IOT

Objective of the Course:

This Course focuses on hands-on IoT concepts such as sensing, actuation and communication. It covers the development of Internet of Things (IoT) prototypes— including devices for sensing, actuation, processing, and communication— to help you develop skills and experiences. The Internet of Things (IoT) is the next wave, world is going to witness. Today we live in era of connected devices the future is of connected things.

Learning Outcome:

After the completion of the course, the students will be able design some IoT based prototypes.

Detailed Course Syllabus:

1. Introduction to IOT

- Understanding IoT fundamentals
- IOT Architecture and protocols
- Various Platforms for IoT
- Realtime Examples of IoT
- Overview of IoT components and IoT Communication Technologies
- Challenges in IOT

2. Arduino Simulation Environment


- Arduino Uno Architecture
- Set up the IDE, Writing Arduino Software
- Arduino Libraries
- Basics of Embedded C programming for Arduino
- Interfacing LED, push button and buzzer with Arduino
- Interfacing Arduino with LCD

3. Sensor & Actuators with Arduino

- Overview of Sensors working
- Analog and Digital Sensors
- Interfacing of Temperature, Humidity, Motion, Light and Gas Sensor with Arduino


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- Interfacing of Actuators with Arduino.
- Interfacing of Relay Switch and Servo Motor with Arduino

4. Basic Networking with ESP8266 WiFi module

- Basics of Wireless Networking
- Introduction to ESP8266 Wi-Fi Module
- Various Wi-Fi library
- Web server - introduction, installation, configuration
- Posting sensor(s) data to web server

COURSE DURATION : 45 Hrs

19E153TOE- ASSEMBLING AND TESTING OF ELECTRICAL

COURSE OBJECTIVES:

Electrical testing can keep your property and those inside safe. Ensures your business is compliant with current electrical standards. Can help to prevent damage to vital electrical assets needed for a business to operate.

Unit I: ELECTRICAL WIRING AND MATERIALS

This may include different types of wiring systems, schematic diagrams, and accessories used for wiring.

Unit II :EARTHING

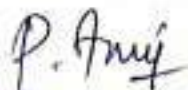
This may include the concept of earthing, the requirement for earthing, and different types of earthing systems.

Unit III :ELECTRICAL PANELS

This may include components installed inside an electrical panel, such as a power distribution panel (PDB) or power control center.

Unit IV :ELECTRICAL CIRCUIT TESTING AND REPAIRING

This may include developing practical knowledge and skills for testing and repairing electrical circuits, including household electrical and electronics appliances.



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Unit V :INSTRUMENTS FOR MEASURING POWER

This may include handling instruments to measure power in DC and AC circuits

COURSE DURATION : 45 Hrs

195153PLC - AUTOMATION USING PLC

COURSE OBJECTIVES:

Programmable Logic Controllers (PLCs) are industrial computers with various inputs and outputs, used to control and manage industrial equipment based on custom programming.

Session 1:

- Introduction about industrial automation
- History of industrial automation
- Need of automation in industries
- Example for industrial automation
- Automatic control circuit and power circuit
- Control systems in industry

Session 2:

- Field Instruments
- Types and uses of field devices
- Automatic control circuits and field devices
- Examples for relays and field devices
- Logic that can be done by relays and field devices

Session 3:

- Introduction about Programmable Logic Controller
- History of PLC
- Architecture of PLC
- CPU
- I/O Modules
- Power Supply and Communications
- Input and Output Devices
- Need of PLC for Industrial Automation

Session 4:

- Types of PLC Models
- Introduction about PLC Programming
- Types of Programming languages
- Introduction about PLC Programming software
- Ladder's main program structure of program
- Power supply voltage ladder diagram
- Ladder logic to give by ladder program in software

Session 5:

- Interfacing the field component to PLC
- Sink and Source to be wiring
- Need of latching for industrial automation
- Importance of latching and unlatching concepts Memory concept

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- Working with Omron Zen Support PLC Software and Siemens Step 7 PLC Software

COURSE DURATION : 45 Hrs

195153PCB- PCB DESIGN AND COMPONENT TESTING

COURSE OBJECTIVES

- Electrical conductivity, including measurement of leakage currents
- Mechanical resistance
- Welds quality
- Cleanliness (weather resistance, including humidity and corrosion)
- Quality of hole wall

Module 1: Getting Started with Altium Designer

- Introduction to Altium Designer
- The Altium Designer environment
- Working with projects and documents

Module 2: Schematic Editor Basics

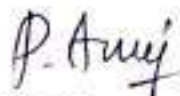
- Schematic Editor Basics
- Schematic graphical objects
- Schematic electrical objects
- Introduction to Schematic Capture
- The Schematic Editor workspace.

Module 3: PCB Design Flow, Transferring a Design and Navigation

- PCB design process
- Design rules and design rule checking
- Automatic routing
- Polygons and the Polygon Manager
- Bill of Materials
- Output Generation
- CAM Editor

Module 4: PCB Testing

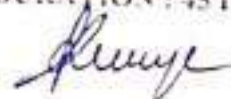
- In-circuit testing
- Flying probe testing
- Automated optical inspection (AOI)
- Burn-in testing
- X-Ray inspection
- Functional testing
- Other functional testing (solderability, contamination, and more)



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COURSE DURATION : 45 Hrs



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Dean (Academic),

School of Agriculture

Date:06.05.2019

CIRCULAR

All the staff members are requested to attend the Board of Study Meeting scheduled on 15.05.2019 (Wednesday) between 10.00 AM to 12.30 PM at Dean cabin, School of Agriculture under the chairmanship of Dr. B.Chandrasekaran. all are requested to attend without fail.

Dean

School of Agriculture

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SCHOOL OF AGRICULTURE

DEPARTMENT ACADEMIC COMMITTEE MEETING 2019-2020

AGENDA

Date: 15.05.2019 (10.00AM)

Venue: School of Agriculture

1.	Welcome address Welcome address by council chairperson
2.	Confirmation minutes To confirm the minutes of the pre board of study meeting
3.	Items reporting the board of study meeting Value added course Syllabus regulation

A handwritten signature in black ink, appearing to be 'V. V. V.' or similar, written over the printed name of the Dean.

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SCHOOL OF AGRICULTURE
MINUTES OF MEETING

The meeting board of studies in School of Agriculture was held on 15th May 2019 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, Chairman
2. Dr. B. Chandrasekaran
Dean
3. Prof. N. Ilanchezhian
Professor, Member
4. Dr. P. Selvaraj
Professor, Member
5. Dr. V. Shanthi
Associate professor, Member
6. Dr. K. Kumarakuru
Associate Professor, Member
7. Dr. V. A. Thirupathi
Assistant professor, member
8. Ms. J. Janusia
Assistant Professor, Member
9. Dr. C. Rathinasabapathy,
Professor (Pathology),
PAJANCOA,
Karaikal Puducherry

Am on

Veer

Ilanchezhian
Selvaraj

Shanthi

Kumarakuru

Thirupathi

Janusia

Rathinasabapathy

Puducherry - Academic expert

9. Mr. S. Saravann

Seed Production and seed processing Unit,
Kumbakonam - 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 the meeting are as follows,

1. The board of study meeting discuss about DAC meeting and confirmation the minutes of DAC meeting
2. The board of study meeting decide to follow the previous regulation for forthcoming batch
3. The board of study meeting discuss about value added course. In the BOS meeting decide to add new value -added course based on skill, Employability and entrepreneurship development.

THE LIST OF NEW VALUE ADDED COURSE:

- Certificate course on Market Analysis
- Certificate course on Sustainable Sugarcane Initiative
- Certificate course on Agri-Business Management
- Certificate course on fish farming
- Certificate course on medicinal garden



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VALUE ADDED COURSE SYLLABUS

INTEGRATED PEST AND DISEASE MANAGEMENT

Unit I: categories of insect pest and diseases, IPDM: introduction, history, importance, concepts, principles and tools of IPDM. Categories of insect pest and disease, IPM: introduction, history, importance, concepts, principles and tools of IPM.

Unit II: calculation and dynamic of economics injury level and importance of threshold level. Methods of control: host plant resistance, cultural, mechanical, physical, legislative, biological and chemical control. Survey surveillance and forecasting of insect pest and diseases.

Unit III: implementation and impact of IPM. Safety issues in pesticides uses, political, social and legal implication of IPM> case histories of important IPM programmes.

Unit IV: methods of diagnosis and detection of various insect pest and disease, methods of insect pest and plant disease measurement, assessment of crop yield calculation based on the economics of IPM.

Unit V: identification of biocontrol agents, different predators and natural enemies, mass multiplication of *Trichogramma*, NPV etc., identification and nature of damage of importance insect pest and diseases and their management.

MARKET ANALYSIS

Unit I: management – concept, process, theories and approaches, management roles and skills- managerial economics – concept & importance demand analysis- utility analysis, indifference curve, elasticity & forecasting

Market structure- market classification, price distribution- national income – concept, types and measurement


Unit II: competency mapping & balanced scoreboard- career planning and development – performance management and appraisal

Organization development, change & OD interventions- talent management & development

Employee engagement & work life balance


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Unit III: accounting principles and standards, preparation of financial statement analysis- ratio analysis, funds flow and cash flow analysis, dupont analysis

Leverage - operating, financial and combined leverage, EBIT- EPS analysis, financial breakeven point & indifference level.

Unit IV: value & return – time performance for money, valuation of bonds and shares, risk and returns.

Capital budgeting – nature of investment, evaluation, comparison of methods; risk and uncertainly analysis- dividend – theories and determination

Unit V: strategic management – concept, process, decision & types- strategic analysis- external analysis, PEST, porter's approach o industry analysis, internal analysis- resource based approach, value chain analysis

Strategy formulation- SWOT analysis, corporate strategy- growth, stability, retrenchment, integration and diversification, business portfolio analysis- BCG, GE business mode.

GREEN HOUSE TECHNOLOGY

Unit-1 Green House General, Introduction to Green House, scope and importance; Types of Green houses, Potential crop for green house

Unit 2-Green House: design and layout - Land survey and levelling, Assessment of structural strength, foundation specifications

Unit 3-Installation of green house - Erection of Greenhouse Structures; Covering with nets and shades (Types of glazing material and its characteristics); Checking of gutters

Unit 4-Maintenance of green house - Maintenance of erected structures; Maintenance of operational elements of the greenhouse for periodic checking, tightening, greasing etc.

Unit 5-Health and safely, Understanding about basic safety checks, operation of all machinery and vehicles and hazards; render appropriate emergency procedures

AGRI BUSINESS MANAGEMENT

Unit-I: Evolution of management thought, systems and contingency approach for understanding


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organisations, managerial process, functions, skills and roles in organisations

Unit-II: Social responsibility of business, communication

Unit-III: Understanding the managing individual behaviour-perception, personality, values, attitudes,

learning, work motivation, individual decision making and problem solving

Unit-IV: Understanding and managing group process-interpersonal and group dynamics, applications

of emotional intelligence in organisations, group decision making, leadership and influence process.

Unit-V: Understanding and managing organisational system-organisational decision and structure, work stress

SUSTAINABLE SUGARCANE INITIATIVE

Unit I: Botany, Climate, Season and Varieties of Sugarcane

Unit II: nursery management and cultivation practice in soil

Unit III: irrigation and nutrient management in SSI

Unit IV : crop protection (weed management, disease, pest management)

Unit V: harvest and post- harvest technology

FISH FARMING

Unit-1 Classification and characteristic features of common species of fishes, brackish water and marine ornamental fishes.

Unit 2- Construction and setting up freshwater aquarium and its maintenance; aquarium plants.

Unit 3 - Mass production of ornamental fishes-food and feeding habits, water quality maintenance, breeding and rearing.



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Unit 4-Bacterial and viral diseases of aquarium fishes-causes, symptoms and control.

Unit 5-Fungal, parasitic and nutritional deficiency diseases-causes, symptoms and control.

MEDICINAL GARDEN

Unit 1 Medicinal Garden definition, history, importance and future prospects. Medicinal Plants-past and present status in world and India.

Unit 2-Medicinal plant diversity & local healthcare. Medicinal plant conservation - issues and approaches. Medicinal plant conservation areas (MPCA), Non-timber forest products (NTFP), Good Agriculture Practices (GAP). Indian Himalayan region (IHR).

Unit 3-Promotion of medicinal plant sector at national level: National Medicinal Plant Board and State Medicinal Plant Boards - objectives and functions.

Unit 4-Important medicinal plants of India with their systematics, geographical distribution and uses. Acorus calamus, Adhatodavasica, Abrus precatorius Aloe vera, Phyllanthus amarus, Stevia rebaudiana, Belladonna and Cinchona.

Unit 5-Important aromatic plants of India with their systematics, geographical distribution and uses. Introduction and historical background of aromatic plants. Aromatic and cosmetic products. Raw material for perfumes etc. Cosmetic Industries. Major, minor and less known aromatic plants of India.


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SCHOOL OF COMMERCE AND BUSINESS MANAGEMENT
DEPARTMENT OF COMMERCE

MINUTES OF BOARD OF STUDIES MEETING

The board of studies meeting for the department of commerce is held on 10.04.2019 at 10.a.m in ,PRIST Deemed to University ,Thanjavur under the chairmanship (Dr.S.Rajendran/prof & HOD (Chairman,BOS)

The following members were present:

Dr.S.Rajendran (Chairperson/HoD/BOS Member)

Dr.K.Prakash Babu (External Expert-Academic/ BOS Member)

M.Kumaravelu(External Expert- Industry/ BOS Member)

Dr.R.Selvaraj(Professor/ BOS Member)

Dr.S.Kamaraju(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)

Dr.T.J.Jayacholan(Special Invitee-Dean/ BOS Member)

R.Rajkumar(Special Invitee-Alumnus/Alumna)

B.Kanmani(Special Invitee -Current student)

Dr. S. Rajendran
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Dr. T. J. Jayacholan
Dean
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15. A. Chandhi/ Assistant Prof (Member, BOS)
16. D. Arana/ Assistant Prof (Member, BOS)
17. C. Jayasudhan/ Assistant Prof (Member, BOS)
18. A. Sivathi/ Jaffer/ Assistant Prof (Member, BOS)
19. Dr. R. Rajarathini/ Assistant Prof (Member, BOS)
20. V. Selvam/ Assistant Prof (Member, BOS)
21. DR. R. Prakash Babu, Associate Professor, Commerce (External Member, BOS)
22. M. K. Suresh Babu, Auditor (External Member, BOS)

The Chairman (BOS) welcomed all the members and presented the feedbacks about existing curriculum received from various Stock holders and also from the department academic advisory committee. To have progressive exit course in the B.Com, B.Com CA, M.Com. Curriculum.

The members of the Board have unanimously discussed and carefully reviewed the existing syllabus for B.Com., B.Com. CA., M.Com., M.Phil. in detail and made the necessary changes in updating (UG & PG) as mentioned below.


REVIEW OF CURRICULUM & SYLLABUS in B.Com

REGULATION 2019

Agenda: Revision of the existing Curriculum based on NAAC guidelines

It is decided to revise the syllabus of B.Com., B.Com. CA. & M.Com., M.Phil. program by incorporating the following aspects:

1. Specific mentioning should be made in the curriculum with regards to:
 - Program outcomes
 - Program specific outcomes
 - Course objectives
 - Course outcomes (Annexure 1)
2. Develop curricula with relevance to
 - Local needs
 - Regional needs
 - National needs
 - Global needs
3. Develop existing course with focus on:
 - Employability
 - Entrepreneurship
 - Skill development (Annexure 2)


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- Develop existing course with focus on:
 - Gender
 - Environment and sustainability
 - Human values and professional ethics (Annexure X)

1. Introduce field trip, research projects and internships at the end of each academic year
2. Research collaborations with research institutes to facilitate the creation and signing of MOU's with them

Members started reviewing the syllabus of each course extensively. The following changes were proposed.

The meeting adopts the following resolutions:

- Define and include Program outcome/ course objectives and course outcomes in the syllabus
- Divide or restructure the syllabus for an hour or a suitable time frame
- Enrich the syllabus with relevant topics and avoiding repetitions
- ICSS has approved the induction of. Saffari Ram as the alumni representative

ANY OTHER ITEMS, IF ANY, WITH THE PERMISSION OF THE CHAIRMAN OF THE BOS

As the whole, this new initiative was very much appreciated by all members. The challenges faced can be periodically discussed with them. They also congratulated the faculty members for their team efforts towards continuing Education.

The following changes have been made in spacing with respect to existing curriculum.

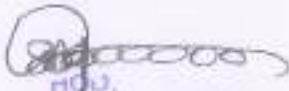
Inclusion of new Courses

1. Partnership Accounts
2. Programme Exit Examination

Change of course content for the following Courses in UG (B.Com)

Course content for the following subjects can be modified/ upgrade

- Business Accounting – 21 unit & V Unit Added
- Corporate Accounting – Changed from IV Semester to V Semester
- Corporate Accounting – IV Unit Added
- Advanced Corporate Accounting – This Course is Deleted
- Co-operative law and Practice – Changed from VI Semester to V Semester
- Income Tax Law and Practice – Changed from V Semester to VI Semester


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- Co-operative Theory - Changed from V Semester to VI Semester
- Principles of Insurance - This Course is Deleted
- Industrial Taxes - This Course is Deleted

Addition of Skill Based Course

Nil

Introduction of employability, entrepreneurship (Assorted Courses)

1. Partnership Accounts - Employability
2. Banking Services - Employability
3. Stock Exchange Practices - Skill Development

Introduction of new additional Elective Courses

1. Stock Exchange Practices
2. Banking Services

Curriculum of newly introduced programmes

Nil

Suggestions given by the BOS members of Associate II

- The BOS members reviewed the proposed syllabus of Undergraduate program based on the CBCS curriculum
- In the curriculum "Corporate Accounting" course to be removed. The new course introduce for "Partnership Accounts" in the fourth semester.

The suggestions given by the BOS Members in second semester under Regulation 2019 (Associate I)

In the course "Business Accounting" the removal related to Royalty Accounts to be removed. Intangible purchase system may be including in the Unit II.

Unit III Admission and Retirement of a partner, Death of a partner account to be removed. Average date date-Royalty Accounts to be exclude.

Dissolution of firm, piecemeal distribution accounts to be removed. Consignment-Joint venture Accounts to be included may be Unit IV.

The suggestions given by the BOS Members in fourth semester under Regulation 2019 (Associate I)


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In the curriculum, BOS recommended that the "Corporate Accounting" course transfer to 6th semester. This semester introduce the new course "Partnership Accounts".

The suggestions given by the BOS Members in 6th semester under Regulation 2019 Annexure D

Advanced Corporate Accounting course to be removed in this semester.

In this semester introduce the new course "Corporate Accounting". Corporate Accounting course's Legislative final statement of accounts to be removed. Include the Missing Company Accounts Unit IV.

The suggestions given by the BOS Members in curriculum of Programme Elective & General Elective Courses under Regulation 2019

In the curriculum "Income Law and Practice" course transfer to VI semester. Introduce General course "Stock Exchange Practice" in the fifth semester.

In the curriculum "Co-operative Theory" course transfer to sixth semester. This semester optional course "Co-operative Law and Practice" at the fifth semester.

In the curriculum "Principles of Insurance" course to be removed in the sixth semester.

This semester "Income Tax Law and Practice" optional I and optional II "Co-operative Theory" with seminar exams.

The open elective "Business Taxes" course to be removed. Introduce the new course in "Banking Services".

REVIEW OF CURRICULUM & SYLLABUS in (UG (B.Com.CAI)

The following changes have been made in spinning with respect to existing curriculum.

Inclusion of new Courses

1. Business Accounting
2. Programme Exit Examination

Change of course content for the following Courses in UG (B.Com.CAI)

CAI

Course content for the following subjects can be modified / upgraded

1. Business Statistics - IV & V One Change


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- 1. Business Management – (New Course is Added)
- 2. Corporate Accounting – IV and V semesters

Addition of Skill Based Course

Nil

Introduction of employability, entrepreneurship / Career Courses

- 1. Business Accounting – Skill Development
- 2. Banking Services – Skill Development
- 3. Stock Market Practices – Skill Development

Introduction of new, additional Elective Courses

- 1. Stock Market Practices
- 2. Banking Services

Curriculum of newly introduced programmes

Nil

ANY OTHER ITEMS, IF ANY, WITH THE PERMISSION OF THE CHAIRMAN OF THE BOS

In the whole, this new initiative was very much appreciated by all members. The suggestions raised can be periodically discussed with them. They also complimented the faculty members for their team efforts in providing Education.

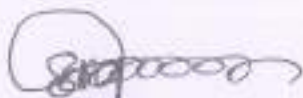
Suggestion given by the BOS members if, any, and if:

- 1. The BOS members reviewed the proposed syllabus of Undergraduate programme based on the CBSE curriculum.
- 2. In the certificate "Advertising and Publicity" course to be removed. The new course introduces the "Business Accounts" in the second semester.

The suggestions given by the BOS Members in semester under Regulation 2019(Annexure

1)

- In the course "Business Accounting" introduce the new course in the second semester.
- Business Statistics IV and V semesters (overall change from IV semester)
- Unit IV course to be removed. Quantitative analysis in the practice of management – models and their development – matrices – addition – multiplication – transpose – inverse – introduction to linear programming –



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concepts of optimization – solving LP using graphical and simplex method – transportation – assignment – (only simple problems).

- Include the new content to Time series – moving – Business forecasting – Methods of forecasting trend – Graphical, three average, moving average and least square method.
- Unit V contents to be revised. Simulation – Queuing Model (MMU) – replacement decisions.
- Include the new content to Methods of construction of index numbers – Unweighted Aggregate Price Index – Weighted Aggregate Index Numbers – Quantity Index Numbers – Test for Index Numbers – Time Reversal test – Factor reversal Test – Chain base Method – Advantages of Chain base Index Numbers – Cost of living Index Numbers.
- In the course "Corporate Accounting" content Accounts of Insurance Companies to be removed. Valuation of goodwill and shares – Liquidation Final statement of accounts may be include in the fourth semester.

The suggestions given by the BOS Members in curriculum of Programme Elective & General Elective Courses under Regulation 2019

- In the curriculum, BOS recommended that "Investment Management" course to be removed in the fifth semester.
- In the course "Stock Market Practice" introduce the fifth semester of Discipline Elective Courses.
- The open elective "Business Ethics" course to be removed. Introduce the new course "Thinking, Reasoning" in the sixth semester.

REVIEW OF CURRICULUM & SYLLABUS in PG (M.Com)

The following changes have been made in upcoming with respect to existing curriculum.

Inclusion of new Courses

1. Total Quality Management
2. Securities Analysis and Portfolio Management
3. Programme Exit Examination

Change of course content for the following Courses in PG (M.Com)

Course content for the following subjects can be modified / upgraded


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1. Industrial Relations and Labour Law - This Course is deleted in II Sem
2. Entrepreneurial development in India - This Course is deleted in II Sem

Addition of Skill Based Course

Nil

Introduction of employability, entrepreneurship (Assured Course)

1. Total Quality Management - Employability
2. Security Analysis and Portfolio Management- Skill Development
3. Retail Management- Skill Development
4. Financial Services - Skill Development

Introduction of new additional Elective Courses

1. Retail Management
2. Financial Services

Curriculum of newly introduced programmes

Nil

ANY OTHER ITEMS, IF ANY, WITH THE PERMISSION OF THE CHAIRMAN OF THE BOS

On the whole, this new initiative was very much appreciated by all members. The challenges faced can be periodically discussed with them. They also congratulated the faculty members for their hard efforts towards continuing Education.

Suggestion given by the BOS members (Annexure D)

- The BOS members reviewed the proposed syllabus of Postgraduate programs based on the UGC curriculum

The suggestions given by the BOS Members in semester under Regulation 2019, Annexure E)

- In the curriculum "Entrepreneurial Development in India" course to be removed.
- Introduce the new course "Total Quality Management" in the second semester
- In the curriculum, BOS recommended that "Security Analysis and Portfolio Management" course to be introduce the second semester

The suggestions given by the BOS Members in curriculum of Programme Discipline Specific Elective & Open Elective Courses under Regulation 2019

- Industrial Relation and Labour law course to be removed in the second semester


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- New course introduce the "Brand Management" in the second semester
- Information Technology and Computer Application course to be removed in the fourth semester. New course introduce the "Managerial Communication" in the fourth semester
- The Open elective "Insurance Services" course to be removed in the curriculum. BOS recommended that introduce the new course "Financial Services" in the third semester
- The members had a brainstorming discussion and interaction among themselves. After discussion, fruitful suggestions were incorporated appropriately in the Curriculum and Syllabus.
- Based on the suggestions and recommendations given by the members, BOS decided to recommend the following to the Academic Council for further approval.

- a) The syllabus for PG degree programme under Regulation 2019.
- b) The modification in curriculum under Regulation 2019.
- c) The syllabus for introduce the Programme Exit Examination under regulation 2019.
- d) The list of Board of Examiners.


Dr. S. Rajeswari, Head of the Department thanked all the members for their kind cooperation and the meeting came to an end.

Members of the Board updated the panel of examiners and submitted the same to the Academic Council for an approval.

- Annexure 1 - Course syllabus
- Annexure 2 - Employability
- Annexure 3 - Human value
- Annexure 4 - Revised Curriculum structure Chassis
- Annexure 5 - Revised Curriculum structure and Syllabus of U/G
- Annexure 6 - Revised curriculum structure and syllabus of Add on course
- Annexure 7 - Revised Curriculum structure and Syllabus of PG
- Annexure 8 - List of Examiners

Note: Annexure I, II, III, IV, V, VI, VII are signed by Chairman of BOS

The Meeting concluded with thanks from Head of Studies Chairman.


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Introduction of new courses :

Name of the programme	Name of the Course	Course Code	Year of introduction
B. Com	Partnership Accounts	19161SEC 43	2019
B. Com	Program Exit Examination	19161PEE	2019
B. Com	Stock Exchange Practice	19161DSC55A 1	2019
B. Com CA	Business Accounting	19198SEC 23	2019
B. Com CA	Management Information System	19198DSC55A	2019
B. Com CA	Program Exit Examination	19261PEE	2019
B. Com CA	Stock Market Practice	19198DSC55B	2019
M.Com	Total Quality Management	19261SEC22	2019
M.Com	Securities Analysts and Portfolio Management	19261SEC24	2019
M.Com	Program – Exit Examination	19261PEE	2019
M.Com	Corporate Legal Frame Work	19261DSC25A	2019
M.Com	Retail Management	19261DSC25B	2019

The following Value Added new diploma and Certificate Course (2019-2020)

SNO	COURSE TITLE	COURSE CODE
1	Industrial Safety	1961CTS
2	Banking & Finance	1961CDBF
3	Digital Business Model	1961CDBM
4	Corporate Social Responsibility	1961CCSR
5	Certificate course in GST	190021GST


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MEMBERS SIGNATURE.

Dr.S.Rajendran (Chairperson/HoD/BOS Member)

Dr.R.Prakash Babu (External Expert-Academic/ BOS Member)

M.Kumaravelu(External Expert- Industry/ BOS Member)

Dr.R.Selvaraj(Professor/ BOS Member)

Dr.S.Kamaraju(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)

Dr.T.J.Jayacholan(Special Invitee-Dean/ BOS Member)

R.Rajkumar(Special Invitee-Alumnus/Alumna)

B.Kannan(Special Invitee -Current student)

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DEPARTMENT OF COMMERCE

SCHOOL OF COMMERCE AND BUSINESS MANAGEMENT

DEPARTMENT OF COMMERCE


B.Com – REGULATION 2019

COURSE STRUCTURE

Course Code	Course Title	L	T	P	C
SEMESTER - I					
19110 AEC 11/ 19132AEC11/ 19111AEC11/ 19135AEC11	Tamil - I / Hindi - I / Advanced English-I/ French-I	4	0	0	2
19111AEC 12	English - I	4	0	0	2
19161SEC 13	Basic Accounting	5	0	0	4
19161SEC 14	Business Environment	5	0	0	4
19161AEC 15	Marketing	4	0	0	4
19161AEC 16	Business Economics	4	0	0	3
191 SEC01	Skill Based Elective Course - I	0	0	2	1
19111SEC01L	Communicative English Lab- I	0	0	1	1
191INDCONS	Indian Constitution	0	0	0	1
	Total	26	0	3	22
SEMESTER- II					
19110 AEC 21/ 19132AEC21/ 19111AEC21/ 19135AEC21	Tamil - II / Hindi - II / Advanced English - II/ French-I	4	0	0	2
19111AEC 22	English - II	4	0	0	2
19161SEC 23	Business Accounting	5	0	0	4
19161SEC 24	Ethics in Business	4	0	0	4
19161AEC 25	Business Statistics	5	0	0	4
19161AEC 26	Business Organization and Management	4	0	0	3
19161RLS27	Research Led Seminar	-	-	-	1
191 SEC02	Skill Based Elective Course - II	0	0	2	1
19111SEC02L	Communicative English Lab - II	0	0	1	1
	Total	26	0	3	22
SEMESTER - III					
19110 AEC 31/ 19132AEC31/ 19111AEC31/ 19135AEC31	Tamil - III / Hindi - III / Advanced English - III French-III	4	0	0	2
19111AEC 32	English - III	4	0	0	2
19161SEC 33	Cost Accounting	5	0	0	4
19161SEC 34	Banking Theory Law and Practice	4	0	0	4
19161AEC 35	Business law For Managers	4	0	0	4
19161AEC 36	Essentials of Business Communication	4	0	0	3

19161RMC37	Research Methodology	2	0	0	2
191-SEC03-	Skill Based Elective Course – III	0	0	2	1
19111SEC03L	Communicative English Lab – III	0	0	1	1
	Total	27	0	3	23
	SEMESTER - IV				
19110AEC 41/ 19132AEC41/ 19111AEC41/ 19135AEC41	Tamil – IV / Hindi – IV / Advanced English – IV/ French-IV	4	0	0	2
19111AEC 42	English – IV	4	0	0	2
19161SEC 43	Partnership Accounts	5	0	0	4
19161SEC 44	Advertising and sales Promotion	4	0	0	4
19161AEC 45	Company Law and Secretarial Practice	4	0	0	4
19161AEC 46	Office management	4	0	0	3
191-SEC04--	Skill Based Elective Course – IV	0	0	2	1
19111SEC04L	Communicative English Lab - IV	0	0	1	1
191ENVTSTU	Environmental studies	2	0	0	2
	Total	27	0	3	23
	SEMESTER - V				
19161SEC51	Corporate Accounting	5	0	0	5
19161SEC52	Financial Management	5	1	0	5
19161SEC53	Financial Services	5	0	0	4
19161SEC54	Computer Application in Business	5	1	0	4
19161DSC55 -	Discipline Specific Elective – I	5	0	0	4
19161BRC56	Participation in Bounded Research	-	-	-	2
191-SEC05--	Skill Based Elective Course – V	0	0	2	1
19111SEC05L	Communicative English Lab – V	0	0	1	1
	Total	25	2	3	26
	SEMESTER - VI				
19161SEC61	Management Accounting	5	1	0	5
19161SEC62	Entrepreneurship and Small Business Management	5	0	0	5
19161SEC63	Auditing	4	1	0	4
19161DSC64 -	Discipline Specific Elective – II	5	0	0	4
191- -OEC--	Open Elective	4	0	0	2
19161PRW66	Project Work	-	-	-	4
191-SEC06--	Skill Based Elective Course – VI	0	0	2	1
19111SEC06L	Communication English Lab – VI	0	0	1	1
19161EXACT	Extension activities	0	0	0	1
19161PEE	Program Exit examination	0	0	0	2
	Total	23	2	3	29
	Total Credits of the Programme	-	-	-	145

New course introduced


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SEMESTER	COURSE CODE	COURSE TITLE
V	19161DSC55A	Stock Exchange Practice
	19161DSC55B	Cooperative Law and Practice
VI	19161DSC64A	Income Tax Law and Practice
	19161DSC64B	Co-Operation Theory

DISCIPLINE SPECIFIC ELECTIVE COURSES

Semester	Open Elective Courses
V	a) 19110OEC-Tamil Ilakkiya Varalaru b) 19111OEC-Journalism c) 19112OEC-Development of Mathematical Skills d) 19113OEC-Instrumentation e) 19114OEC-Food and Adulteration f) 19116OEC - Wildlife Conservation g) 19120OEC-E- Learning h) 19122OEC-Web technology

Open Electives

Skill based Electives

Semester	Skill based Elective Courses
I	a) 19120SEC01AL-Package Lab - I b) 19160SEC01B-Soft skill - I
II	a) 19120SEC02AL-Package Lab - II b) 19160SEC02B-Soft skill - II
III	a) 19120SEC03AL-Package Lab - III b) 19160SEC03B-Soft skill - III
IV	a) 19120SEC04AL-Package Lab -IV b) 19160SEC04B- Soft skill - IV
V	a) 19120SEC05AL-Package Lab -V b) 19160SEC05B-Soft skill - V
VI	a) 19120SEC06AL-Package Lab -VI b) 19160SEC06B-Soft skill - VI

B.COM CREDIT DISTRIBUTION

Sem	AEC	SEC	DSC	OEC	Research	Others	Total
I	11	10	-	-	-	01	22
II	11	10	-	-	01	-	22
III	11	10	-	-	02	-	23
IV	11	10	-	-	-	02	23
V	-	20	04	-	02	-	26
VI	-	16	04	02	04	03	29
Total	44	76	08	02	09	06	145


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DEPARTMENT OF COMMERCE

B.Com-CA (Computer Applications)

COURSE STRUCTURE

SEMESTER - I

COURSE CODE	COURSE TITLE	L	T	P	C
19110AEC11/19111AEC11/ 19132AEC11/19135AEC11	Tamil -I/ Advanced English -I/ /Hindi - I/French -I	4	0	0	2
19111AEC12	English I	4	0	0	2
19198SEC 13	Financial Accounting	5	0	0	5
19198SEC 14	Business Management	4	0	0	3
19198AEC 15	Information Technology	4	0	0	4
19198AEC 16	Operating System	4	0	0	4
191--SEC01--	Skill Based Elective - I	0	0	2	1
19111SEC01L	Communicative English Lab -I	0	0	1	1
191INDCONS	Indian Constitution	1	0	0	1
	TOTAL	26	0	3	23

SEMESTER - II

COURSE CODE	COURSE TITLE	L	T	P	C
19110AEC21/19111AEC21/ 19132AEC21/19135AEC21	Tamil -II / Advanced English - II/ /Hindi - II/French -II	4	0	0	2
19111AEC22	English II	4	0	0	2
19198SEC 23	Business Accounting	5	0	0	4
19198SEC 24	Business Law	4	0	0	4
19198AEC 25	Programming in C	6	0	0	6
19198AEC26L	Programming in C Lab	0	0	3	2
19198RSL27	Research Led seminar	0	0	0	1
191_SEC02--	Skill Based Elective - II	0	0	2	1
19111SEC02L	Communicative English Lab - II	0	0	2	1
	TOTAL	23	0	7	23


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SEMESTER - III

COURSE CODE	COURSE TITLE	L	T	P	C
19110AEC31/19111AEC31/ 19132AEC31/19135AEC31	Tamil -III / Advanced English -III/ /Hindi - III/French -III	4	0	0	2
19111AEC 32	English - III	4	0	0	2
19198SEC 33	Cost Accounting	5	0	0	5
19198SEC 34	Banking Theory Law and Practice	4	0	0	3
19198AEC 35	Programming in C++	6	0	0	6
19198AEC 36L	Programming in C++ lab	0	0	3	2
19198RMC37	Research Methodology	3	0	0	3
191_SEC03--	Skill Based Elective - III	0	0	2	1
19111SEC03L	Communicative English Lab - III	0	0	2	1
	TOTAL	26	0	7	25

SEMESTER - IV

COURSE CODE	COURSE TITLE	L	T	P	C
19110AEC41/19111AEC41/ 19132AEC41/19135AEC41	Tamil -I/ Advanced English -I/ /Hindi - I/French -I	4	0	0	2
19111AEC42	English IV	4	0	0	2
19198SEC43	Auditing	5	0	0	5
19198SEC44	Business Statistics	4	0	0	5
19198AEC45	Visual Basic Programming	6	0	0	6
19198AEC46L	Visual Basic Programming Lab	0	0	3	2
191_SEC04--	Skill Based Elective - IV	0	0	2	1
19111SEC04L	Communicative English Lab -IV	0	0	1	1
191ENVTSTU	Environmental Studies	1	0	0	1
	TOTAL	24	0	6	25


SEMESTER - V

COURSE CODE	COURSE TITLE	L	T	P	C
19198SEC51	Corporate Accounting	5	0	0	5
19198SEC52	Business Economics	5	0	0	5
19198SEC53	Financial Management	5	0	0	5
19198SEC54	Software Engineering	4	0	0	4
19198DSC55	Discipline Specific Elective - I	4	1	0	4
19198BRC56	Participation in Bounded Research	0	0	0	2
191_SEC05--	Skill Based Elective - V	0	0	2	1
19111SEC05L	Communicative English lab V	0	0	2	1
	TOTAL	23	1	4	27

SEMESTER - VI

COURSE CODE	COURSE TITLE	L	T	P	C
19198SEC61	Management Accounting	5	1	0	5
19198SEC62	Income Tax Law and Practice	5	0	0	5
19198SEC63	Database Management System	4	0	0	4
19198DSC64	Discipline Specific Elective - II	4	0	0	4

191_OEC65	Open Elective - I	4	0	0	2
19198PRW66	Project Work	2	0	0	4
191_SEC06--	Skill Based Elective - VI	0	0	2	1
19111SEC06L	Communicative English lab - VI	0	0	2	1
19161EXACT	Extension Activities	0	0	0	1
19261PEE-	Program Exit Examination	0	0	0	2
	Total	24	1	4	29
	Total Credits of the Programme				152

 New course introduced

DISCIPLINE SPECIFIC ELECTIVE

SEMESTER	ELECTIVE NO	COURSE CODE	COURSE TITLE
V	I	19198DSC55A 19198DSC55B	Management Information System Stock Market Practice
VI	II	19198DSC64A 19198DSC64B	E- Commerce Web Designing

OPEN ELECTIVE VII

SEMESTER	OPEN ELECTIVE NO	COURSE CODE	COURSE TITLE
VI	A	19111OEC	Journalism
	B	19112OEC	Development of Mathematical Skills
	C	19113OEC	Instrumentation
	D	19114OEC	Food and Adulteration
	E	19117OEC	Mushroom Technology
	F	19120OEC	Web Technology
	G	19122OEC	E- Commerce and its application


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SKILL BASED ELECTIVE

SEMESTER	SKILL BASED ELECTIVE COURSE NO	COURSE CODE	COURSE TITLE
I	I	19120SEC01AL / 191--SEC01B	Package lab – I / Soft Skills- I
II	II	19120SEC02AL / 191--SEC02B	Package lab – II / Soft Skills - II
III	III	19120SEC03AL / 191--SEC03B	Package lab – III / Soft Skills -III
IV	IV	19120SEC04AL / 191--SEC04B	Package Lab – IV/ Soft Skills - IV
V	V	19120SEC05AL / 191--SEC05B	Package lab – V / Soft Skills - V
VI	VI	19120SEC06AL/ 191--SEC06B	Package Lab – VI / Soft Skills -VI

B.Com – CA Credit Distribution

Sem	AEC	SEC	DSC	OEC	Research	Others	Total
I	12	10	-	-	-	01	23
II	12	10	-	-	01	-	23
III	12	10	-	-	03	-	25
IV	12	12	-	-	-	01	25
V	-	21	04	-	02	-	27
VI	-	16	04	02	04	03	29
Total	48	79	08	02	10	02	150


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DEPARTMENT OF COMMERCE
SCHOOL OF COMMERCE AND MANAGEMENT

DEPARTMENT OF COMMERCE

M.Com- REGULATION 2019

COURSE STRUCTURE

Course Code	Course Title	L	T	C
SEMESTER I				
19261SEC11	Marketing research and Consumer Behavior	6	0	4
19261SEC12	Human Resource management	6	0	4
19261SEC13	Services Marketing	5	0	4
19261SEC14	Advanced Cost Management	6	1	4
19261DSC15 --	Discipline Specific Elective - I	5	0	4
19261RLS16	Research Led Seminar	-	-	1
	Total	28	1	21
SEMESTER - II				
19261SEC21	Quantitative Techniques For Decision Making	5	1	4
19261SEC22	Total Quality Management	5	0	4
19261SEC23	Advanced Management Accounting	5	1	4
19261SEC24	Securities Analysis and Portfolio Management	5	0	4
19261DSC25 -	Discipline Specific Elective - II	5	0	4
19261RMC26	Research Methodology	3	0	2
19261BRC27	Participation in Bounded Research	-	-	2
	Total	28	2	24
SEMESTER - III				
19261SEC31	Project Planning and Control	5	1	5
19261SEC32	Advanced Corporate Accounting	5	2	5
19261SEC33	Investment Management	5	2	5
19261DSC34 -	Discipline Specific Elective - III	5	0	4
192 - - OEC35	Open Elective	4	0	3
19261SRC36	Participation in Scaffold Research (Societal Project)	-	-	2
	Total	24	5	24
SEMESTER - IV				
19261SEC41	Income Tax Law and Tax Planning	5	2	5
19261SEC42	International Business	5	1	5
19261SEC43	Co- Operation in India and Abroad	5	1	5
19261DSC44 -	Discipline Specific Elective - IV	5	0	4
19261PRW45	Project Work	-	-	6
19261PEE	Program Exit Examination	-	-	2


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	Total	20	4	27
	Total Credit For the Programme	-	-	96

New course introduced

DISCIPLINE SPECIFIC ELECTIVE COURSES


SEMESTER	COURSE CODE	COURSE TITLE
I	19261DSC15A 19261DSC15B	Strategic Management Organizational Behaviour
II	19261DSC25A 19261DSC25B	Corporate Legal Frame Work Retail Management
III	19261DSC34A 19261DSC34B	Indian Financial System International Marketing
IV	19261DSC44A 19261DSC44B	Information Technology and Computer Applications International Financial Management

Open Electives:

Semester	Open Elective Courses
III	a) 19211OEC-Writing for the media b) 19212OEC-Applicable Mathematics Techniques c) 19213OEC-Bio-medical Instrumentation d) 19214OEC-Green Chemistry e) 19215OEC-Herbal Medicine f) 19220OEC-M-Marketing g) 19280OEC-Counselling Psychology

M.Com Credit Distribution

Semester	SEC	DSC	OEC	Research	Others	Total
I	16	04	-	01	-	21
II	16	04	-	04	-	24
III	15	04	03	02	-	24
IV	15	04	-	06	02	27
Total	62	16	03	13	02	96


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B.COM – 2019 REGULATION

PRIST UNIVERSITY, THANJAVUR
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COURSE CODE	COURSE TITLE	L	T	P	C
19101SEC-41	Partnership Accounts	5	0	0	5

AIM:

The purpose of this article is to assist candidates to develop their understanding of the topic of accounting for partnerships.

OBJECTIVES:

To provide students an exposure to understand the practice of Partnership Accounts

Unit - I

Partnership - Meaning, Partnership Deed, Capital Accounts, Accounting Treatment - Distribution of Profits- Interest on Partner's Loans - Interest on Capital and Drawings - Salary and Commission of Partner- P&L Appropriation Account- Capital Accounts of partners - Fixed- Fluctuating Past Adjustment and guarantee.

Unit - II

Admission of Partner, Calculation of Profit sharing ratio- Revaluation of assets and Liabilities- Treatment of Goodwill- Adjustments in Partners' capital Accounts - Revaluation of Assets and Liabilities- Accumulated Profits and Losses,-Partner's Capital Accounts and Balance Sheet.

Unit -III

Retirement of a Partner-calculation of gaining ratio- Treatment of goodwill- Revaluation Of assets and liabilities-Accumulated reserves and profits- Adjustments regarding partner's Capital Account- Calculation of profit up to the date of death of a partner- Preparation of Capital Accounts and Balance Sheet.

Unit -IV


Dissolution of partnership firm- Realization of asset and making payment of Liabilities Treatment of unrecorded Assets and Liabilities- Preparation of Realization Accounts - Partner's Capital Accounts and Bank Accounts -Insolvency of a partner- Garner vs Murray-insolvency of all partners Piece-meal distribution - Proportionate capital - Maximum possible loss.

Unit - V

Amalgamation of firms - Computation of purchase consideration. - Conversion of sale of a partnership firm to a company.

Text and Reference Books (Latest revised edition only)

1. Financial Accounting by T.S. Reddy and A. Murthy, Margham Publications, Chennai.
2. Modern Accountancy by A Mukherjee and M Hanif TMH Publishing company -New Delhi
3. Financial Accounting by Dr. S.N. Maheswari, Vikas Publishing House, New Delhi.
4. Advanced Accounting by Grewal and Shukla, S.Chand Publishers, New Delhi.
5. Introduction to Accounting by P.C. Tulasian, Pearson Editions.
6. Financial Accounting by Jain & Narang, Kalyani Publishers, Chennai


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Stock Exchange Practice
SUB CODE: 19161DSC55A

This course aims at giving a comprehensive understanding on the stock market operations in terms of its structure, trading, settlement procedures, processes and related components and the regulations, emerging challenges in the Indian Stock market.

OBJECTIVES

To provide an introduction to the financial markets and to analyze the role of financial markets for the broader macro. The course will help them in building career in stock market/broking houses. To help them to understand the practical aspects of primary and secondary market operations.

UNIT- I

Capital Markets in India - An overview of Indian Securities Market. Meaning, Functions, Intermediaries, Role of Primary Market - Methods of flotation of capital - Problems of New Issues Market - Investor protection in primary market - Recent trends in primary market - SEBI measures for primary market.

UNIT-II

Stock exchanges and its Functions: Meaning, Nature, Functions of Secondary Market - Organization and Regulatory framework for stock exchanges in India - SEBI: functions and measures for secondary market - Overview of major stock exchanges in India -

UNIT- III

Trading, settlement and Surveillance System In Stock Exchanges: Different trading systems - BSE - BOLT System - Different types of settlements - Pay-in and Pay-out - Intraday Delivery - Short delivery - Auction - NSE - NEAT system options - Market types, Order types and books

UNIT- IV

Meaning, Purpose, and Construction in developing index - Methods (Weighted Aggregate Value method, Weighted Average of Price Relatives method, Free-Float method) - Stock market indices in India - BSE Sensex - Stock selection criteria

UNIT-V

Commodity exchanges: evolution and history - role in globalizing economy - governing regulations - price risk management - commodity exposure

OUTCOMES:

Students will get a basic introduction to stocks as well as have practical applications of how to invest. This course aims to help students build the ability and knowledge to make their own decisions with their investment decisions in the stock market.

Text Book:

1. Punithavathy Pandian, "Security Analysis and Portfolio Management", Vikas Publishing House Pvt. Ltd.
2. Prasanna Chandra, "Investment Analysis and Portfolio management", Tata McGraw Hill, 1st Edn., 2008
3. V. A. Avadhani, Investment and Securities Market in India, Himalaya Publishing House
4. Sanjeev Agrawal, A Guide to Indian Capital Market, Bharat Publishers .


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B.COM
Program Exit Examination
19161PEE

AIM

To study about the personal values and moral standards and the importance of honesty in business.

COURSE OUTCOMES

- To clarify what is ethics and what is not ethics in business.
- To apply the ethical principles in day – to –day business practices.
- To know the role of various agencies in ensuring the ethics principles and their practices.
- To analyze ethical issues in Indian business.

UNIT – I

Self Study Unit: Branch accounts (excluding foreign branches)- Departmental accounts.

UNIT – II

Hire purchase accounts-Installment purchase system

UNIT – III


Production Function – Factors of Production – Laws of Return – Cost of Production – Curve -Scale of Production – Economies of Large Scale Production.

UNIT – IV

Sales Promotion – Meaning – Importance of Sales Promotion – Objectives; Advertising – Definition – Objectives – Functions – Importance of Advertising – Advantages and Disadvantages. UNIT – V
Depreciation – Methods Fixed – Diminishing Annuity – Depreciation Fund – Provisions and Reserves-Fire Claims.

UNIT – V

Depreciation – Methods Fixed – Diminishing Annuity – Depreciation Fund – Provisions and Reserves-Fire Claims.


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COURSE CODE	COURSE TITLE	L	T	P	C
BI19ISEU 23	Business Accounting	3	0	0	3

AIM:

- To learn the accounting mechanism this is necessary for Business Accounting

OBJECTIVES

The subject of Financial Accounting includes basic concepts underlying the accounting practices and its techniques with special reference to Sole Proprietorship, departmental accounts and partnership accounts.

UNIT-I

Final Accounts of a Sole Trader – Adjustments

UNIT-II

Departmental accounts – His purchase accounts – Royalty accounts

UNIT-III

Average due Date – Sale or Return – Bill of Exchange

UNIT-IV

Depreciation – Methods – Fixed – Diminishing – Annuity – Depreciation Fund – Provision and Reserves

UNIT-V

Partnership Fundamentals Partnership Final Accounts

OUTCOMES:

The student gain knowledge on accounting mechanism which is necessary for the preparation of the business accounting.

Reference Books:

1. Jain, S.P. and K.L. Narang, Financial Accounting, Kalyani Publishers, New Delhi.
2. S.N. Mithalwari, Financial Accounting, Vikas Publication, New Delhi. T.L.Grewal, Introduction to accounting, S. Chand and Co., New Delhi
3. Accounting for Managers - I. Mada Gowda – Himalaya Publishing House
4. Financial Accounting Reddy and Murthy


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Management Information System SUB CODE: 20198DSC55A

COURSE CODE	COURSE TITLE	L	T	P	C
20198DSC55A	Elective – I A – Management Information System	3	0	1	2

The overall aim of the course is to provide students with an understanding as how to use and manage information systems in order to revitalize business processes, improve business decision making, and gain competitive advantage.

OBJECTIVES:

- i. To describe the role of information technology and decision support systems in business and assess the current status with those of the firm to solve business problems.
- ii. To introduce the fundamental principles of computer-based information systems analysis and design and develop an understanding of the present and future technologies used.
- iii. To enable students understand the various knowledge representation methods and design expert systems to utilize as strategic weapons to assist the firms to business and make business more competitive.
- iv. To enable the students to use information to assess the impact of the Internet and Internet technology on electronic commerce and electronic business and understand the specific threats and vulnerabilities of computer systems.
- v. To provide the theoretical models used in database management systems to answer business questions.

UNIT I

The meaning and use of MIS, System View of Business, Process of MIS, Development of MIS within the organization, Management Process, Information Needs, System Approach to Planning, Organizing and Controlling MIS.

UNIT II

Planning, Implementation and Controlling of Management Information System.

UNIT III

Evolution of Data Processing, Computer Operation of Manual Information System, Components of Computer Systems, Flow Chart, Conversion of Manual to Computer Based Systems, Computer System Software: Application Software, Telecommunication Medium.

UNIT IV


Managerial Decision Making, characteristics and components of Decision Support Systems.

UNIT V

System Design: System design considerations, input/output design, forms design, file organization and database, data management, file design, program design, control and security.

OUTCOME:

- Define the basic concepts and technologies used in the field of management information systems.
- Compare the processes of developing and implementing information systems.
- Outline the role of the ethical, social, and security issues of information systems.
- Analyze the role of information systems in organizations, the strategic management processes, with the implications for the management.
- Apply the understanding of how various information systems like DBMS work together to accomplish the information objectives of an organization.


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B.COM CA – 2019 REGULATION

STOCK MARKET PRACTICE COURSE CODE : 19198DSC55B

AIM:

This course aim at giving a comprehensive understanding on the stock market operations in terms of its structure, trading, settlement procedures, processes and related components and the regulations, emerging challenges in the Indian Stock market.

OBJECTIVES

To provide an introduction to the financial markets and to analyze the role of financial markets for the broader macro. The course will help them in building career in stock market/broking houses. To help them to understand the practical aspects of primary and secondary market operations.

UNIT-I

Capital Markets in India - An overview of Indian Securities Market, Meaning, Functions, Intermediaries, Role of Primary Market – Methods of floatation of capital – Problems of New Issues Market – Investor protection in primary market – Recent trends in primary market – SEBI measures for primary market

UNIT-II

Stock exchanges and its Functions : Meaning, Nature, Functions of Secondary Market – Organization and Regulatory framework for stock exchanges in India – SEBI : functions and measures for secondary market – Overview of major stock exchanges in India –

UNIT- III

Trading , settlement and Surveillance System In Stock Exchanges : Different trading systems – BSE - BOLT System – Different types of settlements - Pay-in and Pay-out – Bad Delivery – Short delivery – Auction – NSE – NEAT system options – Market types, Order types and books UNIT- IV

Meaning, Purpose, and Construction in developing index – Methods (Weighted Aggregate Value method, Weighted Average of Price Relatives method, Free-Float method) – Stock market indices in India – BSE Sensex - Scrip selection criteria

UNIT-V

Commodity exchanges: evolution and history – role in globalizing economy – governing regulations – price –risk management – commodity exposure OUTCOMES: Students will get a basic introduction to stocks as well as learn practical applications of how to invest. This course aims to help students build the ability and knowledge to make their own decisions with their investment decisions in the stock market.

Text Book:

1. Punithavathy Pandian, "Security Analysis and Portfolio Management", Vikas Publishing House Pvt, Ltd. 2.
2. Prasanna Chandra, "Investment Analysis and Portfolio management", Tata McGraw Hill, 3 rd Edn., 2008
3. V. A. Avadhani, Investment and Securities Market in India, Himalaya Publishing House.
4. Sanjeev Agarwal, A Guide to Indian Capital Market, Bharat Publishers

B.COM CA

Program exit examination

19261PEE

AIM

To study about the personal values and moral standards and the importance of honesty in business.

COURSE OUTCOMES

- To clarify what is ethics and what is not ethics in business.
- To apply the ethical principles in day – to –day business practices.
- To know the role of various agencies in ensuring the ethics principles and their practices.
- To analyze ethical issues in Indian business.

UNIT – I

Self Study Unit: Branch accounts (excluding foreign branches)- Departmental accounts.

UNIT – II

Hire purchase accounts-Installment purchase system

UNIT – III

Production Function – Factors of Production – Laws of Return – Cost of Production – Curve -Scale of Production – Economics of Large Scale Production.

UNIT – IV

Sales Promotion – Meaning – Importance of Sales Promotion – Objectives, Advertising – Definition – Objectives – Functions – Importance of Advertising – Advantages and Disadvantages. **UNIT – V**

Depreciation – Methods Fixed – Diminishing Annuity – Depreciation Fund – Provisions and Reserves-Fire Claims.

UNIT – V

Depreciation – Methods Fixed – Diminishing Annuity – Depreciation Fund – Provisions and Reserves-Fire Claims.


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M.COM-2019 REGULATION

M.COM				
COURSE CODE	COURSE TITLE	L	T	C
19Z618EC02	Total Quality Management	5	0	4

AIM:

Continual improvement of business operations. It strives to ensure all associated employees work toward the common goals of improving product or service quality, as well as improving the procedures that are in place for production.

OBJECTIVES

1. To understand the concept of Quality
2. To understand the Implication of Quality on Business
3. To Implement Quality Implementation Programs
4. To have exposure to challenges in Quality Improvement Programs

UNIT-I

Total Quality Management (TQM): Concepts – TQM in global perspective – Global benchmarking – Business process reengineering – Global standards – ISO 9000 series – Environmental QS 14000- Quality manual – Barriers to TQM.

UNIT-II

Total Quality Management and Leadership: Implementing TQM – Market choices – Meeting customer requirements – Maintaining competitive advantage – Core competencies and strategic alliances for ensuring quality – Quality review, recognition and reward – Quality awards: Japanese Deming Award, US Malcolm Baldrige National Quality Award & Indian Golden Peacock National Quality Award.

UNIT-III

Quality Management Tools for Business Applications: Principles and Applications of Quality Function Development – Failure Mode and Effect Analysis – Taguchi Techniques – Seven old QC Tools – Seven New Management Tools – Statistical Quality Control Techniques (only Theory and no Problems) – Mistake Proofing – Benchmarking – 8D Methodology

UNIT-IV

Quality Improvement for Business Improvement: Dimensions of Quality – Reliability Prediction Analysis – Total Productive Maintenance – Costs of Quality – Business Process Reengineering – Process Capability Analysis – Quality Assurance and ISO9000 Certification – ISO 9001:2000, 40

UNIT-V

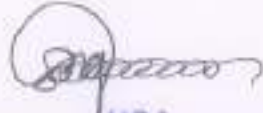
TQM Implementation Strategies: Organizational Structure and Mission of Individuals – Managerial aspects of TQM – Change Management Strategies – Training for TQM – TQM Road Map – Quality Improvement Index – Six Sigma concept.

OUTCOMES:

1. To realize the importance of significance of quality
2. Manage quality improvement issues
3. Identify requirements of quality improvement programs

REFERENCE BOOKS:

1. Total Quality Management – Dale H. Besterfield et al - Pearson Education.
2. Quality Control and Total Quality Management – P.L. Jain - Tata Mc Graw Hill
3. Total Quality Management – Purohit M.Chandrasekhara – Pearson Education.


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PRIST UNIVERSITY, THANJAVUR
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COURSE CODE	COURSE TITLE	L	T	C
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R020150C04	Security Analysis and Portfolio Management	1	1	3
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AIM

It aims at providing an in-depth knowledge of the theory and practice of portfolio management. Important theories, techniques, regulations and certain advancements in theory of investment will be covered with an aim of helping the participants make sound investment decisions in the context of portfolio investment.

OBJECTIVES

- I. Understand the various alternatives available for investment.
- II. Learn to measure risk and return. Find the relationship between risk and return. Value the equities and bonds.
- III. Gain knowledge of the various strategies followed by investment practitioners.

UNIT-I

Investment - Meaning- Nature and Scope - objectives - Speculation - Gambling - investment process - Financial System in India - Risk & Return - Measurement of Risk & Return - Nature-scope-Elements of Investment - Approaches to investment analysis - Securities - types - Features.

UNIT II

Investment alternatives and strategies: Financial investment - Non financial investment - Inbound and outward investments - Sources of Investment Information - valuation of fixed income securities and variable income securities (including Derivatives).

UNIT III

Fundamental Analysis: Economic - Industry and company analysis - Sources of information for analysis.

UNIT IV

Technical Analysis - Types of charts - Dow Theory, Elliott wave theory, Odd-lot Theory, Breadth of Market, Relative Strength Analysis - Moving Average analysis - Efficient Market Hypothesis.

UNIT V

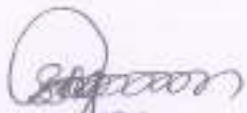
Portfolio analysis & Management: Portfolio risk and return - Diversification - Markowitz model - Sharpe model: Single index model - CAPM - Arbitrage pricing theory.

OUTCOME

The course helps the students in developing an understanding of the changing economic and global investment scenarios in general and Indian capital market in particular with reference to availability of various financial products and operations of stock exchanges.

REFERENCE BOOKS

1. Security Analysis and Portfolio Management : S.Kesava, PBI Learning Pvt Ltd, New Delhi, 1, Security Analysis and Portfolio Management : V.A.Aswalani, Himalaya Publishing House, Mumbai.
2. Security Analysis and Portfolio Management : Purnanavathi Pandian, Vikas Publishing House Pvt Ltd, New Delhi.
3. Investment Management : L. Natarajan, Margham Publications, Chennai.
4. Investment Management : Bhalla, Taneja, B.Choudh & Sons Publishers, New Delhi.


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M.COM-2019 REGULATION

Retail Management

19261DSC25B

AIM: To familiarize students with the decisions involved in running a retail firm and the concepts and principles for making those decisions.

OBJECTIVES

1. To familiarize students with the decisions involved in running a retail firm and the concepts and principles for making those decisions.
2. To introduce the Scope and significance of Retail industry, Trends and Challenges.
3. To comprehend knowledge on all areas of Retail business operations.

UNIT I:

Introduction to Retailing: Concept of retailing, Functions of retailing, Terms & Definition, Retail formats and types, Retailing Channels, Retail Industry in India, Importance of retailing, changing trends in retailing.

UNIT II: Understanding the Retail Consumer: Retail consumer behavior, Factors influencing the Retail consumer, Customer decision making process, Types of decision making, Market research for understanding retail consume

UNIT III: Retail Market Segmentation and Strategies: Market Segmentation and its benefits, Kinds of markets, Definition of Retail strategy, Strategy for effective market segmentation, Strategies for penetration of new markets, Growth strategies, Retail value chain.

UNIT IV: Retail Location Selection: Importance of Retail locations, Types of retail locations, Factors determining the location decision, Steps involved in choosing a retail locations, Measurement of success of location

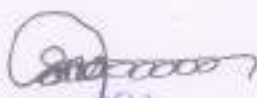
UNIT V: Merchandise Management: Meaning of Merchandising, Factors influencing Merchandising, Functions of Merchandising Manager, Merchandise planning, Merchandise buying, Analyzing Merchandise performance

OUTCOMES:

Upon completion of this course, it will enable students to develop decision making skills related to retailing, define retailing, understand what marketing means to business executives and academics, understand the ways that retailers use marketing tools and techniques to interact with their customers.

REFERENCE BOOKS:

1. Retail Management, Michael Levy & Barton A Weitz, Tata McGraw Hill
2. Retailing Management, Gibson C Vedamani, Jaico Publishing House, Mumbai
3. Retail Strategies- understanding why we shop, Jim, Jaico Publishing House, Mumbai
4. Retail Management, Dunne Lasch, South Western Cengage Learning


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M.COM-2019 REGULATION

CORPORATE LEGAL FRAME WORK SUB CODE: 19261DSC25A

AIM

To understand the fundamental principles of legal and regulatory framework of corporate

business.

OBJECTIVES

- I. To familiarize the students to understand the provisions of corporate laws.
- II. To Study the problems involving issues in corporate laws.
- III. To know the implications of other relevant laws in the corporate management.

UNIT - I

Company: Definition - kinds of companies - Lifting of corporate veil - Pre- Incorporation - Memorandum of Association - Incorporation of a company - Legal Position of a Promoter.

UNIT - II

Membership of companies - Definition - Meeting of the Board of Directors - Kinds of meeting - Quorum - powers of the Chairman - Duties of the chairman - Minutes of meeting.

UNIT - III

Environmental legislation - legal and regulatory frame work - Procedure for obtaining various Environment clearances - functions of Environment Tribunal - Environment Authority - Environment Audit.

UNIT - IV

Consumer Protection Act - Genesis of the law - Objects of consumer protection - Definition - Rights of consumer protection Act - Nature and Scope of Remedies - Injunction and Guarantees - Refund and pledge.

UNIT - V

Insurance Act, 1938 - Insurance Regulatory & Development Act, 1999 - Insurance sector Reforms - IRDA (Investment) Regulations 2000 - IRDA Guidelines for Insurance Brokers Securities and Exchange Board of India SEBI Act, 1992 - SEBI Guidelines.

OUTCOME

The students are now familiarized with the principles of legal and regulatory frame work of corporate business.

REFERENCE BOOKS

1. K.C.MISHRA - Legal and Regulatory Aspects of Insurance.
2. K.C.GARG - Company Law.
3. N.D.KAPOOR - Elements of mercantile law.
4. N.D.KAPOOR - Legal and Regulatory frame work of business.
5. N.K.SINGH/PTA - Environment & Management.



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M.COM
Program – Exit Examination
1926IPEE

AIM

To study about the personal values and moral standards and the importance of honesty in business

COURSE OUTCOMES

- To clarify what is ethics and what is not ethics in business.
- To apply the ethical principles in day – to –day business practices.
- To know the role of various agencies in ensuring the ethics principles and their practices.
- To analyze ethical issues in Indian business

UNIT-1

Testing of Hypothesis: Types I and Type II Errors; Standard Error; Hypothesis Testing of Proportions; Test for Equality of Population Means; Testing of Difference between Proportions; Confidence Interval; Z-Test, t-Test, F-Test and Chi-square Test.

UNIT-2

Econometric Analysis; Correlation Analysis; Regression Analysis; Multiple Regression Analysis; Autocorrelation; Heteroscedasticity; Multi-Colinearity Problems & its solution; Multivariate Analysis; Principal Component Analysis; Discriminant Analysis; Multidimensional Scaling

UNIT-3

Economic Environment of Business: Significance and Elements of Economic Environment, Economic Planning (Planning Commission and Niti Ayog), Industrial Policy 1956 and 1991, Fiscal and Monetary Policy, EXIM Policy.

UNIT-4


Political and Legal Environment of Business: Elements of Political Environment, Government and Business; Legal Environment and its elements- Competition Act, FEMA, Patent Act, Consumer Protection Act, Companies Act and Recent Changes therein.

UNIT-5

Dynamics of Individual Behaviour: Personality- types and determinants; Perception- process and determinant; Attitude- characteristics, components, formation and measurement; Learning- concept and process; Motivation and Motivation theories- Need Hierarchy, Two factors, Expectancy; Impact of morale on work behaviour.

Recommended Books:

1. VSP Rao : Human Resource Management, Text & Cases – Excel Books.
2. Dessler, Gary : Human Resource Management, PHI.
3. Venkataratnam : Personnel Management & Human Resource, Tata McGraw Hill.


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VALUE ADDED NEW CERTIFICATE COURSES-(2019-2020)

SYLLABUS

Course: CERTIFICATE IN GST
Subject Code: 19002IGST

AIMS: To emphasize better performance than the Overall GST

Objectives:

The Goods and Services Tax (GST) in India is to create a unified and simplified tax system, by replacing multiple indirect taxes levied by the central and state governments with a single, comprehensive tax.

OUTCOMES:

From all over study, I concluded that GST has various positive impacts like: GST will also help to have a transparent and corruption free tax administration. GST also has an optional scheme of lower levy for small businesses with turnover between INR 20 to 50 lakhs. It is called the composition scheme.

Unit - I

CASE STUDY - Important terms and definitions under Central Goods and Service Tax Act, 2017 and State Goods and Service Tax Act, 2017. Meaning and scope of supply, Levy and collection of tax.

Unit - II

CASE STUDY - Rate and Value of Supply of goods and / or services, Input Tax Credit, Transitional Provisions, Registration under GST, GST Act, Value of Exemption and Assessment, Payment of Tax, Interest, Penalties of tax, provisions change laws, Related under the Act

Unit - III

CASE STUDY - Maintenance of Accounts and Returns, Composition scheme, Job-work and its provisions, Various Exemptions under GST, Demand and recovery under GST, Miscellaneous provisions under GST

Unit - IV

GST - Scope of GST, Important terms and definitions under Integrated Goods and Service Tax Act, 2017, Levy and collection of GST, Principles for determining the place of supply and Place of supply of goods and services, Place of supply

Unit - V

Customs - Rate of Customs in International Trade, Importation Terms & definitions, under the Customs Act, 1962: Assessable Value, Baggage, Bill of entry, Dutiable Goods, Duty Exempt, Foreign going vessel, Aircraft goods, Import, Import Manifest, Importer, Prohibited Goods, Shipping Bill, Seize, Bill of Lading, Export Manifest, Letter of Credit, Kind of Duties- Basic, anti-dumping, additional or counter-vailing, basis of levy- ad valorem specific duties, Prohibition of Export and Import of Goods and Provisions regarding notified & specified goods, Import of Goods- Free Import and Restricted import, type of Import - Import of Cargo, Import of Personal baggage, Import of Stamps

Suggested readings:

Customs Act 1962 and Rules

Commercial's GST, Commercial law publisher (India) Pvt Ltd, New Delhi

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DIPLOMA COURSES

Banking & Finance

AIM:

Banking and finance is to provide an outlet for the increasing flow of scholarly research concerning financial institutions and the money and capital markets within which they function.

OBJECTIVE:

- To support other objectives of the Government's economic policy, especially growth, employment, and supporting the stability of the financial system.

UNIT 1

Introduction, Understanding what is banking history, types of banks in India- Appreciate role of banks in the economy and the importance of - Understanding the trends and challenges in banking

UNIT 2

Understanding the types of Deposits and explain features- benefits- variants of Savings- Current, Fixed and recurring deposit - Types of Loans- Retail lending, secured and unsecured

UNIT 3

Structure- institution and operating mechanism and its role in Economic Development- Developed and Underdeveloped Markets- Money Market in India: Importance, features instruments - Measures to strengthen money market in India

UNIT 4

New issue market and stock exchange- Importance of stock exchange- National stock exchange - Methods of issuing new issues, types of shares and debentures

UNIT 5

Reconciliation of the working group on money market - Report of the task force on money market and mutual funds 2004 - The Securities and Exchange Board of India (SEBI), need for establishment of SEBI, Objectives and role of SEBI, Capital Market Reforms.

Outcome

Prepare the students to deal with the issue of management of various financing activities in the banks and financial institutions

Reference Books:

- Banking and Finance - N K SINHA
- Corporate Finance - PRASANNA CHANDRA



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Industrial Safety

Objectives:

- To know about Industrial safety programs and toxicology, Industrial laws, regulations and source models.
- To understand about fire and explosion, prevention methods, relief and its saving methods.
- To analyze industrial hazards and its risk assessment.

UNIT I INTRODUCTION

Evolution of modern safety concepts – Fire prevention – Mechanical hazards – Boilers, Pressure vessels, Electrical Exposure.

UNIT II CHEMICAL HAZARDS

Chemical exposure – Toxic materials – Ionizing Radiation and Non-ionizing Radiation – Industrial Hygiene – Industrial Toxicology

UNIT III ENVIRONMENTAL CONTROL

Industrial Health Hazards – Environmental Control – Industrial Noise – Noise measuring instruments, Control of Noise, Vibration, – Personal Protection

UNIT IV HAZARD ANALYSIS

System Safety Analysis – Techniques – Fault Tree Analysis (FTA), Failure Modes and Effects Analysis (FMEA), HAZOP analysis and Risk Assessment

UNIT V SAFETY REGULATIONS

Explosions – Disaster management – earthquake control, hazard control, safety standards and training – Factory Act, Safety regulations, Product safety – other matters.

Text Books:

1. D.A. Crowl and J.F. Louvar, Chemical Process Safety (Fundamentals with Applications), Prentice Hall, 2001

Reference Books:

1. R.K. Sinnot, Crowl & Richardson, Chemical Engineering, Vol. 6, Elsevier India, 2006.
2. Fawcett, H.H. and W.S. Wood, Safety and accident prevention in Chemical operations 2 edition John Wiley and Sons Inc. (1982).

Outcome

- Analyze the effect of release of toxic substances.
- Understand the industrial laws, regulations and source models.
- Apply the methods of prevention of fire and explosions.
- Understand the relief and its saving methods.
- Understand the methods of hazard identification and preventive measures.



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CERTIFICATE COURSE

Corporate social Responsibility

AIM:

To emphasize Better performance than the Overall Market.

OBJECTIVES

understand the nature of CSR

understand that CSR like any other goal helps the firm only when aligned with its strategy.

UNIT I:

Introduction to CSR: Meaning & Definition of CSR, History & evolution of CSR- Concept of Charity, Corporate Citizenship, CSR-an overlapping concept. Concept of sustainability & Stakeholder Management. CSR through triple bottom line and Sustainable Business; relation between CSR and Corporate governance.

UNIT II

International framework for corporate social Responsibility, Millennium Development goals, Sustainable development goals, Relationship between CSR and MDGs, UN guiding principles on business and humanrights.

UNIT III

CSR-Legislation in India & the world: Section 135 of Companies Act 2013, Scope for CSR Activities under Schedule VII, Appointment of Independent Directors on the Board, and Computation of Computation of Net Profit's Implementing Process in India.

UNIT IV

The Drivers of CSR in India, Market based pressure and incentives civil society pressures, the regulatory environment in India Current trends Performance in major business and progress, Voluntary Judicial activities.

UNIT V

Review current trends and opportunities in CSR CSR as a Strategic Business tool for Sustainable Development. Review of successful corporate initiatives & challenges of CSR. Case Studies of Major CSR Initiatives.

Out come:

The ability to have positive impact in the community.

Books/References:

1. Corporate Social Responsibility: An Ethical Approach - Mark S. Schwartz
2. The World Guide to CSR - Wayne Vasser and Nick Tolhurst
3. Innovative CSR by Edmund, Iliescu and Fife
4. Corporate Social Responsibility in India - Sanjay K Agarwal
5. Handbook on Corporate Social Responsibility in India: CII

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DIGITAL BUSINESS MODEL

AIM

To emphasize the Development of Customer benefits using Digital benefits.

OBJECTIVES

- i. To gain expert knowledge of Broad awareness.
- ii. To know the High return on investment and Decrease cost.

UNIT - I

Meaning - Definition - Characteristics - Digital Business Strategy - The Concept and Framework of Digital business Model.

UNIT - II

Drivers and Challenges of DDM - Business model Canvas - Benefits.

UNIT - III

IoT Technologies - IoT Connectivity - IoT Devices - Building the Next generation Enterprise.

UNIT - IV

Digital Threat and Opportunities - Four Business Models.

UNIT - V

Development of Digital Business - Basics of Digital business - Digital business model innovation.

OUTCOME

The Students helped in the Adoption of Digital process and tools to achieve strategic business goals.

REFERENCE BOOKS

1. Well Peter - What's Your Digital Business Model.
2. Venkat Venkatesh - The Digital Matrix.
3. David I. Riggs - The Digital Transformation Playbook.



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**SCHOOL OF COMMERCE AND BUSINESS MANAGEMENT
DEPARTMENT OF MANAGEMENT**

Minutes of Board of Studies Meeting

The BOS meeting for the School of Business held on 10th April 2019 at 10.30 am in West Campus, PRIST University, under the chairmanship (Dr. K. G. Selvan / Prof & HOD (Chairman, BOS)).

The following member were present

- Dr K G Selvan (Chairperson/HoD)
- Prof. V. C. Malarmannan (External Expert-Academic)
- Mr. P. Mukesh kumar (External Expert- Industry)
- Dr. S. Venkatesh / Prof & Member of BOS
- Dr. P. Balasubramanian/ Prof & Member of BOS
- Dr. K Rajalakshmi / Prof & Member of BOS
- Dr. R. Prema / Prof & Member of BOS
- P. Uma Eswari V / Prof & Member of BOS
- K. Sasikumar / Prof & Member of BOS
- Dr T J Jayasholan (Invited Dean)
- V. Sathishkumar (Alumini)
- D. Nandha kumar (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 (B.A, MBA and M. Phil) in detail and made the necessary changes in upcoming (BBA, MBA and M. Phil) as mentioned below:

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. . To have programme exit course in the BBA, MBA, Curriculum.

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

REVIEW OF CURRICULUM & SYLLABUS in BBA

REGULATION 2019

Agenda: Revision of the existing Curriculum based on NAAC guidelines

It is decided to revise the syllabus of BBA, MBA, MPhil, program by incorporating the following aspects.

1. Specific mentioning should be made in the curriculum with regards to:
 - Program outcomes
 - Program specific outcomes
 - Course objectives
 - Course outcomes (Annexure 1)
2. Develop curricula with relevance to
 - Local needs
 - Regional needs
 - National needs
 - Global needs
3. Develop existing course with focus on:
 - Employability
 - Entrepreneurship
 - Skill development (Annexure 2)
4. Develop existing course with focus on:
 - Gender
 - Environment and sustainability
 - Human values and professional ethics (Annexure 3)
5. Introduce field trip, research projects and internships at the end of each academic year
6. Research collaborations with research institutes to facilitate the course and signing of MOU's with them

Members started reviewing the syllabus of each course extensively. The following changes were proposed.

The meeting adopts the following resolutions:

- Define and include Program outcome/ course objectives and course outcomes in the syllabus
- Divide or restructure the syllabus for an hour or a suitable time frame
- Enrich the syllabus with relevant topics and avoiding repetitions
- BOS has approved the induction of Safren Banu as the alumni representative

The following changes have been made in upcoming with respect to existing curriculum.

Inclusion of new Courses

1. Global Business Management
2. Investment Management
3. Programme Exit Examination

Change of course content for the following Courses in UG (BBA)

1. Business Policy and Strategic Management – Unit V Content Changed

Addition of Skill Based Course

Nil

Introduction of employability, entrepreneurship (Assured Course)

1. Skill Development - Team work.

Introduction of new additional Elective Courses

Nil

Curriculum of newly introduced programme

Nil

ANY OTHER ITEMS, IF ANY, WITH THE PERMISSION OF THE CHAIRMAN OF THE BOS

On the whole, this new initiative was very much appreciated by all members. The challenges faced can be periodically discussed with them. They also congratulated the faculty members for their team efforts towards continuing Education.

Suggestion given by the BOS members :(Annexure I)

BUSINESS POLICY AND STRATEGIC MANAGEMENT syllabus content for changed UNIT – V Mergers and Acquisition – Amalgamation – Joint Venture – ERP – ERP Package.

REVIEW OF CURRICULUM & SYLLABUS in PG (MBA)

The following changes have been made in upcoming with respect to existing curriculum.

Inclusion of new Courses

1. Programme Exit Examination

Change of course content for the following Courses in PG (MBA)

Course content for the following subjects can be modified / upgraded

Addition of Skill Based Course

Nil

Introduction of employability, entrepreneur (Assured Course)

1. Skill Development

Introduction of new additional Elective Courses

Nil.

Curriculum of newly introduced programme

Nil

The members had a brainstorming discussion and interaction among themselves. After discussion, fruitful suggestions were incorporated appropriately in the Curriculum and Syllabi.

Based on the suggestions and recommendations given by the members, BOS resolved to recommend the following to the Academic Council for further approval.

- a) The Syllabus for PG degree programme under Regulation 2019.
- b) The modification in curriculum under Regulation 2019
- c) The syllabus for introduce the Programme Exit Examination under regulation 2019.
- c) The list of Board of Examiners.

Dr. J. Jayacholan - Head of the Department thanked all the members for their kind cooperation and the meeting came to an end.

Members of the Board updated the panel of examiners and submitted the same to the Academic Council for its approval.

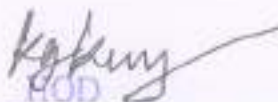
- Annexure 1 - Course outcome
- Annexure 2 - Employability
- Annexure 3 - Human value
- Annexure 4 - Revised Curriculum structure Credits
- Annexure 5 - Revised Curriculum structure and Syllabus of UG.
- Annexure 6 - Revised curriculum structure and syllabus of Add on course
- Annexure 7 - Revised Curriculum structure and Syllabus of PG.
- Annexure 8 - List of Examiners.

Note: Annexure I, II, III, IV, V, VI, VII are signed by Chairman of BOS.

The Meeting concluded with thanks from Board of Studies Chairman.

Signature of the Chairperson & Members

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HOD

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The following New Course Introduced in (2019 – 2020)

Name of the Programme	Name of the Course	Course code	Year of Introduction
BBA	Global Business Management	19160SEC54	2019
BBA	Investment Management	19160DSC55B	2019
BBA	Case Study Analysis	19120SEC06A	2019
BBA	Extension Activity	191EXACT	2019
BBA	Programme Exit Examination	19160PEE	2019
MBA	Design/Socio-Technical Project	19260SRC33	2019
MBA	Programme Exit Exam	19260PEE	2019



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The Board of Studies Discussion on Introduced Value Added Certificate Course
(2019-2020)

S.NO	COURSE TITLE	COURSE CODE
1	Entrepreneurship Development	1960ED
2	Tourism Management	1960TM
3	Digital Marketing	1960DM
4	Marketing Management	1960MM
5	Human Recourse Management	1960HRM
6	Insurance Management	1960IM
7	Agri Business Management	1960ABM
8	Business Writing	19002CCBW

**BACHELOR OF BUSINESS ADMINISTRATION
CURRICULUM (2019 ONWARDS)**

Course Code	Course Title	L	T	P	C
SEMESTER I					
19110AEC11/ 19131AEC11/ 19111AEC11	Tamil I/Hindi I/Advanced English I	4	0	0	2
19111AEC12	English I	4	0	0	2
19160SEC13	Core-I Principles of Management	5	0	0	3
19160SEC14	Core-II Managerial Economics	5	0	0	3
19160AEC15	Allied-I Business Communication	5	0	0	4
19160AEC16	Allied-II Business Mathematics and Statistics	4	0	0	3
19120SEC01A L	Skill Based Elective Course - I	0	0	2	1
19111SEC01L	Communicative English Lab- I	0	0	1	1
191ETHVALS	Ethics and Values	0	0	0	0
SEMESTER II					
19110AEC21/ 19131AEC21/ 19111AEC21	Tamil II/Hindi II/ Advanced English II	4	0	0	2
19111AEC22	English II	4	0	0	2
19160SEC23	Core-III Financial Accounting	5	0	0	3
19160SEC24	Core-IV Organizational Behavior	5	0	0	3
19160AEC25	Allied-III Business Environment	5	0	0	4
19160AEC26	Allied-IV Management Information System	4	0	0	3
19160RLC27	Research Led Seminar	0	0	0	1
19120SEC02A L	Skill Based Elective Course - II	0	0	2	1
19111SEC02L	Communicative English Lab-II	0	0	1	1
SEMESTER III					

19110AEC31/ 19131AEC31/ 19111AEC31	Tamil III/Hindi III/Advanced English III	4	0	0	2
19111AEC32	English III	4	0	0	2
19160SEC33	Core-V Management Accounting	4	0	0	3
19160SEC34	Core-VI Marketing Management	4	0	0	3
19160AEC35	Allied-V Business Law	5	0	0	4
19160AEC36	Allied-VI Human Resource Management	4	0	0	3
19160RMC37	Research Methodology	2	0	0	2
19120SEC03A L	Skill Based Elective Course - III	0	0	2	1
19111SEC03L	Communicative English - III	0	0	1	1
SEMESTER IV					
19110AEC41/ 19131AEC41/ 19111AEC41	Tamil IV/Hindi IV/Advanced English IV	4	0	0	2
19111AEC42	English IV	4	0	0	2
19160SEC43	Core- VII Total Quality Management	5	0	0	3
19160SEC44	Core-VIII Cost Accounting	4	0	0	3
19160AEC45	Allied-VII Retail Management	4	0	0	4
19160AEC46	Allied-VIII Industrial Relations and Labour Law	4	0	0	3
19120SEC04A L	Skill Based Elective Course-IV	0	0	2	1
19111SEC04L	Communicative English-IV	0	0	1	1
191ENVTSTU	Environmental Studies	2	0	0	2
SEMESTER V					
19160SEC51	Core-IX Financial Management	6	0	0	5
19160SEC52	Core- X Services Marketing	5	0	0	3
19160SEC53	Core-XI Production and Operations Management	5	0	0	3
19160SEC54	Core-XII Global Business Management	6	0	0	4

19160DSC54	Discipline Specific Elective -I	5	0	0	3
19160BRC55	Participation Bounder Research	0	0	0	1
19120SEC05A L	Skill Based Elective Course -V	0	0	2	1
19111SEC05L	Communicative English Lab-V	0	0	1	1
SEMESTER VI					
19160SEC61	Core- XIII Business Policy and Strategic Management	5	0	0	4
19160SEC62	Core- XIV Entrepreneurial Development	6	0	0	5
19160SEC63	Core- XV Logistics and Supply Chain Management	5	0	0	4
19160DSC64	Discipline Specific Elective -II	5	0	0	3
191-OEC65	Open Elective	4	0	0	2
19160PRW66	Project Work	0	0	0	4
19120SEC06A	Case Study Analysis	0	0	2	1
19111SEC06L	Communicative English Lab-VI	0	0	1	1
191ENACT	Extension Activity	0	0	0	0
19160PIE	Programmes Exit Examination	0	0	0	1
	TOTAL	-	-	-	127

Discipline Specific Elective Courses:

Semester	Elective No	Course Code	Course Title
V	I	19160DSC54A	Advertising and salesmanship
		19160DSC54B	Investment Management
VI	II	19160DSC64A	Customer Relationship Management
		19160DSC64B	Financial Services

Open Elective Courses

Semester	Course Code	Course Title	Department
VI	19117OEC	Mushroom Technology	Microbiology
	19120OEC	Web Technology	Computer Science
	19114OEC	Food and Adulteration	Chemistry

Skill Based Elective Courses

Semester	Elective No	Course Code	Course Title
I		19120SEC01A	Fundamentals of Computers
I		19160SEC01B	Soft Skills- I
II	II	19120SEC02A	Ms office Packages Lab
		19160SEC02B	Soft Skills-II
III	III	19120SEC03A	Writing and Presentation Skills Lab
		19160SEC03B	Soft Skills -III
IV	IV	19120SEC04A	General Aptitude and Personality Development Lab
		19160SEC04B	Soft Skills-IV
V	V	19120SEC05A	Photo shop Lab
		19160SEC05B	Soft Skills- V

**MASTER OF BUSINESS ADMINISTRATION
CURRICULUM (2019 ONWARDS)**

SL. NO	COURSE CODE	TITLE OF THE COURSE	CREDIT	MARKS
SEMESTER - I				
1.	19260SEC11	Management Concepts	3	100
2.	19260SEC12	Organizational Behavior	3	100
3.	19260SEC13	Accounting for Managers	4	100
4.	19260SEC14	Economics for Managers	3	100
5.	19260SEC15	Legal Aspects of Business	3	100
6.	19260SEC16	Statistics for Managers	4	100
7.	19220SEC01	Managerial Skill Development-Lab	1	100
8.	19260CRS17	Research Led Seminar	1	100
SEMESTER - II				
9.	19260SEC21	Financial Management	4	100
10.	19260SEC22	Human Resource Management	3	100
11.	19260SEC23	Marketing Management	3	100
12.	19260SEC24	Production & Operations Management	3	100
13.	19260RMC25	Research Methodology	3	100
14.	19260SEC26	Strategic Management	3	100
15.	19220SEC02	Data Analysis Lab	1	100
16.	19260BRC27	Participation in Bounded Research	2	100
SEMESTER - III				
17.	19260SEC31	International Business Environment	3	100
18.	19260SEC32	Operations Research	4	100
19.	19260SRC33	Design/Socio-Technical Project	2	100
20.	19260E-3-	Elective I	3	100

21.	19260E-3-	Elective2	3	100
22.	19260E-3-	Elective3	3	100
23.	19260E-3-	Elective4	3	100
24.	19260E-3-	Elective5	3	100
SEMESTER - IV				
25.	19260SEC41	Entrepreneurial Development	4	100
26.	19260E-4-	Elective6	3	100
27.	19260E-4-	Elective7	3	100
28.	19260PRW44	Project Work	10	300
29.	19260PEE	Programme Exit Exam	2	100
		TOTALCREDITS	90	

SPECIALIZATIONS

MARKETING

S.NO	COURSE CODE	TITLE OF THE COURSE	SEMESTER
1	19260EA33	Consumer Behaviour	III
2	19260EA34	Integrated Marketing Communication	III
3	19260EA35	Brand Management	III
4	19260EA36	Retail Management	III
5	19260EA37	Sales Management	III
6	19260EA38	Services Marketing	III
7	19260EA39	Industrial Marketing	III
8	19260EA42	Customer Relationship Management	IV
9	19260EA43	International Marketing	IV
10	19260EA44	Rural Marketing	IV

HUMAN RESOURCE

S.NO	COURSE CODE	TITLE OF THE COURSE	SEMESTER
1	19260EB33	Knowledge Management	III
2	19260EB34	Organizational Development & Change management	III
3	19260EB35	Performance Management	III
4	19260EB36	Labour Legislations	III
5	19260EB37	Compensation and Reward Management	III
6	19260EB38	Cross Cultural Management	III
7	19260EB39	Conflict and Negotiation Management	III
8	19260EB42	Industrial Relations	IV
9	19260EB43	Training & Development	IV
10	19260EB44	Talent Management	IV

FINANCE

S.NO	COURSE CODE	TITLE OF THE COURSE	SEMESTER
1	19260EC33	Security Analysis and Portfolio Management	III
2	19260EC34	Derivatives Management	III
3	19260EC35	Project Finance	III
4	19260EC36	Financial Services and Institutions	III
5	19260EC37	International Finance	III
6	19260EC38	Insurance and Risk Management	III
7	19260EC39	Corporate Finance	III
8	19260EC42	Micro Finance	IV
9	19260EC43	Strategic Financial Management	IV
10	19260EC44	Merchant Banking and Financial Services	IV

PRODUCTION AND OPERATIONS

S.NO	COURSE CODE	TITLE OF THE COURSE	SEMESTER
1	19260ED33	Project Management	III
2	19260ED34	Planning and control of operations	III
3	19260ED35	Technology Management	III
4	19260ED36	Logistics Management	III
5	19260ED37	Supply Chain Management	III
6	19260ED38	Business-Process Reengineering	III
7	19260ED39	Materials Management	III
8	19260ED42	Maintenance Management	IV
9	19260ED43	Service Operations Management	IV
10	19260ED44	Product Design	IV

LOGISTICS AND SUPPLY CHAIN

S.NO	COURSE CODE	TITLE OF THE COURSE	SEMESTER
1	19260EE33	Purchasing and Procurement Management	III
2	19260EE34	Material Management	III
3	19260EE35	Inventory Management	III
4	19260EE36	Supply Chain Management	III
5	19260EE37	Logistics Management	III
6	19260EE38	Custom House Practice And Legalities	III
7	19260EE39	Export Trade and Documentation	III
8	19260EE42	Quality Management	IV
9	19260EE43	Air Cargo Logistics Management	IV
10	19260EE44	Shipping and Ocean Freight Logistics Management	IV

INTERNATIONAL BUSINESS

S.NO	COURSE CODE	TITLE OF THE COURSE	SEMESTER
1	19260EF33	International Marketing	III
2	19260EF34	International Human Resource Management	III
3	19260EF35	Cross Cultural Management	III
4	19260EF36	Global Logistics and Supply Chain Management	III
5	19260EF37	International Trade Procedures and Documentation	III
6	19260EF38	International Strategic Management	III
7	19260EF39	Global Business Ethics and Corporate Governance	III
8	19260EF42	Management Of International Developmental Organizations	IV
9	19260EF43	Merger and Acquisitions	IV
10	19260EF44	International Financial Management	IV

SYSTEMS

S.NO	COURSE CODE	TITLE OF THE COURSE	SEMESTER
1	19260EG33	Software Engineering	III
2	19260EG34	Software Project Management	III
3	19260EG35	Relational Database Management Systems	III
4	19260EG36	E-Business Technology and Management	III
5	19260EG37	Data Warehousing & Data Mining	III
6	19260EG38	Knowledge Management	III
7	19260EG39	Enterprise Resource Planning	III
8	19260EG42	Information Storage & Management	IV
9	19260EG43	Cloud Computing	IV
10	19260EG44	Decision Support System And Intelligent Systems	IV

HOSPITAL MANAGEMENT

S.NO	COURSE CODE	TITLE OF THE COURSE	SEMESTER
1	19260EH33	Management Of Hospital Services	III
2	19260EH34	Operations Management In HealthCare	III
3	19260EH35	Marketing Management Of Hospital And Health Care Services	III
4	19260EH36	Community Health and Management of National Health Programmes	III
5	19260EH37	Management of Clinical and Super Specialty Services in Hospitals	III
6	19260EH38	Patient Care Management	III
7	19260EH39	Health Related Laws and Ethics	III
8	19260EH42	Medical Tourism	IV
9	19260EH43	Hospital Architecture, Planning, Design and Maintenance	IV
10	19260EH44	Hospital Waste Management	IV

TOURISM

S.NO	COURSE CODE	TITLE OF THE COURSE	SEMESTER
1	19260EI33	Tourism Principles, Policies and Practices	III
2	19260EI34	Tourism Products of India	III
3	19260EI35	Destination Planning and development	III
4	19260EI36	Travel agency and Tour operations	III
5	19260EI37	Hospitality Management	III
6	19260EI38	Indian culture and Heritage	III
7	19260EI39	Tourism Marketing	III
8	19260EI42	Ecotourism	IV
9	19260EI43	Event Management	IV
10	19260EI44	E-Tourism	IV

AGRI BUSINESS MANAGEMENT

S.NO	COURSE CODE	TITLE OF THE COURSE	SEMESTER
1	19260EJ33	Agribusiness Environment and Policy	III
2	19260EJ34	Agricultural Marketing Management	III
3	19260EJ35	Farm Business Management	III
4	19260EJ36	Management of Agribusiness Cooperatives	III
5	19260EJ37	Food Retail Management	III
6	19260EJ38	Management of Agricultural Input Marketing	III
7	19260EJ39	Agri Supply Chain Management	III
8	19260EJ42	Agriculture Economics	IV
9	19260EJ43	Agricultural and Micro-Finance	IV
10	19260EJ44	New Trends and Development Agri-Sector	IV

BBA - 2019 REGULATION
PRIST UNIVERSITY, THANJAVUR

Course Code	Course Title	L	T	P	C
19160SEC54	GLOBAL BUSINESS MANAGEMENT	6	0	0	4

OBJECTIVES:

To make students Understand the fundamental concepts of international trade Comprehend basic principles of MNCs and Acquire broad knowledge on Global Liberalization and WTO Agreements.

COURSE OUTCOMES

Use data, predictive modeling, and analysis to recommend strategies to support management decisions in global context.

Develop, execute and analyse a comprehensive business plan in alignment with the organization's local and global initiatives or goals.

Conduct global and domestic business with diverse populations using culturally appropriate methods in compliance with relevant national and international laws, policies, regulations, and ethical practices.

Assist in the importing and exporting functions of a business.

Use project management principles, tools, and techniques to define timelines and evaluate project deliverables for all members of cross functional, intercultural and multidisciplinary teams.

Apply financial decision making that complies with jurisdictional practices in the operations of global business.

Integrate leadership theory into practice to drive organizational change while maintaining working relationships and team performance.

UNIT-I

International Business: An over view-Types of International Business-Domestic and International Business - Economic and Political Environment - Cultural Environment - Recent World Trade and Foreign Investment Trends.

UNIT-II

Indian Export Performance - Problems in export trade - Export promotion in India - Export promotion incentives - EPZ & FTZ - 100% EOU - Export Houses - Star Export Houses - Trading Houses - Star Trading Houses- Super Star Trading Houses.



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UNIT-III

GATT –Uruguay Round Negotiation-WTO–GATS–TRIMS-TRIPS–Agreement- Dispute settlement under WTO – Tariff Barriers.

UNIT- IV

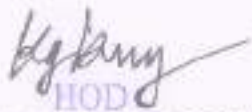
MNC-Meaning–Dominance of MNCs–MNCs and International Trade-Models–MNCs in India.

UNIT- V

Globalization of Business–Recent Trends-Implication and Impact–Policy Options- Liberalization and Integration with the Global Economy– Impact of Privatization in India.

References:

1. Francis Cherunilam; 'International Business' (EEE), PHI – New Delhi – 2004. (Chapters 5, 9, 20, 24 & 26)
- International Business – By Rakesh Mohan Joshi, Oxford University Press, Chennai.
- Victor Luis Anthuvan – Issues in Globalization.
- International Business – By Donald A Ball and others, India Edition, TATA Mc Graw Hill.
- International Business– S. Shajahan, Mac millan India Ltd., Chennai.
- International Business – Justin Paul, PHIL. earning Pvt. Ltd. New Delhi.



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Course Code	Course Title	L	T	P	C
19160DSE54 B	INVESTMENT MANAGEMENT	5	0	0	3

Objective:

To enable the students to acquire knowledge of Investment management on successful completion of this course, the students should have understood Investment a venues Security analysis.

COURSE OUTCOMES

Understand different investment alternatives in the market

- Understand how securities are traded in the market
- Be able to analyze and price different securities
- Be able to manage a portfolio
- Understand basics in derivatives

UNIT-I

Concept of investment - importance. Features of Investment, Speculation - Forms of investment - Bank deposits, Post office schemes, Government Securities, Mutual fund schemes; Provident funds, Company deposits-Real estate Gold & Silver.

UNIT-II

Investment Instruments-Capital market instruments, Money market instruments, Derivatives- Futures & Options, Shares- types & features, Debentures- nature & types. Primary market-Role of NIM, methods of floating new issues.

UNIT-III

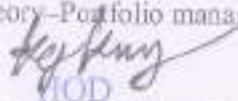
Secondary market-functions, Bombay Stock Exchange, National Stock Exchange-trading practices, security market indicators. Return-Risk- kinds; Role of SEBI.

UNIT-IV

Security analysis- Fundamental analysis: economic, industry and company analysis. Technical Analysis, Dow Theory, types of Charts, important chart patterns.

UNIT-V

Efficient Market theory. Random Walk Theory, weak form, semi strong form & strong form. Portfolio Analysis; Markowitz theory-Portfolio management.


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References:

Preethi Singh-Investment Management

Bhalla G.S.-Investment Management

Francis Cherunilam- Investment Management

Dr. Avadhani-Investment Management



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Course Code	Course Title	L	T	P	C
191EXACT	EXTENTION ACTIVITY	5	0	0	3

AIM

Extension activities are an integral part of any educational curriculum, offering students an opportunity to explore beyond traditional classroom learning.

COURSE OUTCOMES

- Utilize the knowledge of English language to be an effective facilitator
- Plan and impart speaking skills adopting different strategies
- Analyse the health issues and suggesting possible solutions
- Evaluate the necessity of the villagers based on societal need and make suggestions accordingly
- Assess the educational and career need of the village students and suggest possible ways to fulfil the need

UNIT I

Facilitating English Learning Skills 1. Listening Skills – Story telling 2. Reading Skills – Pronunciation 3. Writing Skills – Spelling, Sentence, Description

UNIT II

Spoken English 1. Rhymes, Tongue Twisters 2. Patterns and Dialogue 3. Self-introduction and Narration

UNIT III

HEALTH AND HYGIENE 1. Cleanliness – Personal and environmental 2. Healthy habits 3. Arranging Medical Camp

UNIT IV

SOCIAL AWARENESS 1. Government schemes 2. Awareness on recent topics of concern 3. Women's Rights & Consumer Rights

UNIT V

CAREER GUIDANCE 1. Scope for higher studies 2. Job opportunities 3. Self-employment, self-help groups



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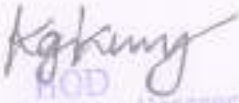
REFERENCE BOOKS

Pillai, K. Ramachandran. Let's Speak: Spoken English for School Children and Other. H & C Publishing House, 2014.

Singh, K. An Introduction to Social Work. ABD Publishers, 2011.

Richards, Jack C, and Theodore S. Rodgers. Approaches and Methods in Language Teaching. Cambridge University Press, 2014.

Chandra, M. Career Information and Guidance and Counselling. Isha Books, 2009.


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Course Code	Course Title	L	T	P	C
19160PEE	PROGRAMME EXIT EXAMINATION	5	0	0	3

AIM

To study about the personal values and moral standards and the importance of honesty in business.

COURSE OUTCOMES

- To clarify what is ethics and what is not ethics in business.
- To apply the ethical principles in day – to –day business practices.
- To know the role of various agencies in ensuring the ethics principles and their practices.
- To analyze ethical issues in Indian business.

UNIT – I

Self Study Unit: Branch accounts (excluding foreign branches)- Departmental accounts.

UNIT – II

Hire purchase accounts-Installment purchase system

UNIT – III


Production Function – Factors of Production – Laws of Return – Cost of Production – Curve – Scale of Production – Economics of Large Scale Production.

UNIT – IV

Sales Promotion – Meaning – Importance of Sales Promotion – Objectives; Advertising – Definition – Objectives – Functions – Importance of Advertising – Advantages and Disadvantages.

UNIT – V

Depreciation – Methods Fixed – Diminishing Annuity – Depreciation Fund – Provisions and Reserves- Fire Claims.



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Course Code	Course Title	L	T	P	C
19260SRC33	DESIGN SOCIO-TECHNICAL PROJECT	5	0	0	3

AIM

To give an exposure to development of research questions and the various statistical methods suitable to address them through available literature, with basic computational operators.

UNIT- I

Knowledge Workshop - Source and Document information on environmentally friendly design -Project 1 : Research on a past movement of Design

UNIT- II

Project 2 : Photograph and report on an Architectural monument of national repute/ recognition -
Project 3 : Critique the Design of display and control of a complex product such as computer/
washing medicine/ medical equipment

UNIT- III

Design Concept workshop - Design concept workshop on Design for Handicapped - Design concept workshop on Sustainable Design - Design concept workshop on Interface Design

UNIT- IV

Product Design workshop - Produce Design for a product for children -Produce Design for display and control for Senior Citizens -Design a functional product from waste

UNIT- V

Digital workshop - Introduction to Basic Design software - Digitize images for reproduction - Project 1: Digital workshop Adobe Photoshop - Project 2: Digital workshop Adobe Illustrator - Project 3: Digital workshop Adobe In-Design.



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Course Code	Course Title	L	T	P	C
19260PEE	PROGRAMME EXIT EXAMINATION	5	0	0	3

AIM

To study about the personal values and moral standards and the importance of honesty in business.

COURSE OUTCOMES

- To clarify what is ethics and what is not ethics in business.
- To apply the ethical principles in day – to –day business practices.
- To know the role of various agencies in ensuring the ethics principles and their practices.
- To analyze ethical issues in Indian business.

UNIT – I

Self Study Unit: Branch accounts (excluding foreign branches)- Departmental accounts.

UNIT – II

Hire purchase accounts-Installment purchase system

UNIT – III

Production Function – Factors of Production – Laws of Return – Cost of Production – Curve - Scale of Production – Economics of Large Scale Production.

UNIT – IV

Sales Promotion – Meaning – Importance of Sales Promotion – Objectives; Advertising – Definition – Objectives – Functions – Importance of Advertising – Advantages and Disadvantages.

UNIT – V

Depreciation – Methods Fixed – Diminishing Annuity – Depreciation Fund – Provisions and Reserves- Fire Claims.



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Course Code	Course Title	L	T	P	C
19120SEC06A	CASE STUDY ANALYSIS	5	0	0	3

OBJECTIVE

Prepare for management consulting interviews by providing a "tool-kit" made up of facts and frameworks that will guide thinking and analysis.

COURSE OUTCOMES

- Course Overview/Consulting questions/Frameworks
- Competitive Landscape, Simple Excel models, Gas Widget Model
- Market Entry and Competitive Positioning
- Competitive Advantage and Entrepreneurship
- Financial Ratios; Working Session

UNIT - I

Overview of "Tool-kit" • Tool-kit facts – need to memorize • Practice consulting questions in small group
Two methods for each question: o Back of the envelope o Use Excel to organize assumptions and calculate formulas

UNIT - II

Porter's 5 Forces. Analyze an industry. • Simple and complex models in Excel. Syllabus Fall 2017 Prof. Monica Stallings • Explain Gas Widget model exercise. • Quickly preview Supply Chain

UNIT – III

RTE analysis and discussion

UNIT – IV

Prepare case study: Costco
Gas Widget Model
Email me your cover letter and resume for critique

UNIT – V

Costco analysis and discussion
SWOT Analysis


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VALUE ADDED DIPLOMA AND CERTIFICATE COURSE SYLLABUS

DIPLOMA COURSES

ENTREPRENEURSHIP DEVELOPMENT

PAPER 1: INTRODUCTION TO ENTREPRENEURSHIP

Unit 1

Entrepreneurship Essentials- Concepts and Overview of Entrepreneurship- Evolution and Growth of Entrepreneurship in India- Role of Entrepreneurship in Economic Development

Unit 2

Theories and Models of Entrepreneurship- Framework of Entrepreneurship Theories- Models of Entrepreneurship- Emerging Models of Corporate Entrepreneurship

Unit 3

Dimensions of Entrepreneurship- Entrepreneurial Culture -Entrepreneurial Society- Women Entrepreneurship- Rural Entrepreneurship

Unit 4

Emerging Trends and Social Entrepreneurship- Emerging Trends in Entrepreneurship Development- Entrepreneurial Potential and Potential Entrepreneur- Evaluation of Social Entrepreneurship in India

TOURISM

PAPER I: TOURISM PRINCIPLES, POLICIES AND PRACTICES

Unit-I Tourism; an overview: Elements, Nature and Characteristics - Typology of Tourism - Classification of Tourists - Tourism network - Interdisciplinary approaches to tourism - Historical Development of Tourism - Major motivations and deterrents to travel.

Unit-II Tourism Industry; Structure and Components: Attractions - Accommodation - Activities - Transportation - F&B - Shopping - Entertainment - Infrastructure and Hospitality - Emerging areas of tourism - Rural, Eco, Medical, MICE, Literary, Indigenous, Wellness, Film, Golf, etc., - Ideals of Responsible Tourism - Alternate Tourism - Case Studies on International Tourism.

Unit-III Tourism Impacts - Tourism Area Life Cycle (TALC) - Doxey's Index - Demonstration Effect - Push and Pull Theory - Tourism System - Mathieson and Wall Model & Leiper's Model - Stanley Plog's Model of Destination Preferences - Demand and Supply in tourism - Tourism regulations - Present trends in Domestic and Global tourism - MNC's in Tourism Industry.

Unit-IV Tourism Organizations: Role and Functions of World Tourism Organization (WTO), Pacific Asia Travel Association(PATA) , World Tourism &Travel Council (WTTC) - Ministry of Tourism, Govt. of India, ITDC, Department of Tourism, Govt. of Puducherry, FHRAI, IHA, IATA, TAAI, IATO.

TEXT BOOKS

1. Charles R. Goeldner & Brent Ritchie, J.R. (2006), Tourism, Principles, Practices, Philosophies, John Wiley and Sons, New Jersey.

DIGITAL MARKETING

PAPER 1: DIGITAL MARKETING FUNDAMENTALS

Marketing v/s Sales
Marketing Mix and 4 Ps
What is Digital Marketing
Inbound vs Outbound Marketing
Content Marketing
Understanding Traffic
Understanding Leads
Strategic Flow for Marketing Activities

PAPER 2: WEBSITE PLANNING AND STRUCTURE

WWW
Domains
Buying a Domain Website
Language & Technology
Core Objective of Website and Flow
One Page Website
Strategic Design of Home Page
Strategic Design of Products & Services Page S
Strategic Design of Pricing Page
Portfolio, Gallery and Contact Us Page
Call to Action (Real Engagement Happens)
Designing Other Pages
SEO Overview
Google Analytics Tracking Code
Website Auditing Designing
Word press Website

PAPER 3: EMAIL MARKETING – CONTENT WRITING

Email Machine – The Strategy
Email Frequency
Why People Don't Buy
The Fuel – Value
Triggers In Email using 4Ps
Sequence of Email Triggers
Email Example – Topic
Email Example – Intro
Email Example – Product
Email Example – Secondary Value

MARKETING MANAGEMENT

SEMESTER I

MARKETING MANAGEMENT

UNIT I Marketing: Meaning – Concept & its types – Functions and organisation – Marketing Planning– Core concepts of marketing (such as Need, Want, Demand, Customer Value, Exchange, Customer & Consumer, Customer Satisfaction, Customer Delight, Customer Loyalty, Marketing v/s Market, Selling versus Marketing). Concept of Marketing Myopia - Marketing Segmentation and Consumer Behaviour – Marketing Research

UNIT II Product Characteristics – Classification – Product Differentiation – Product Hierarchy – Co-Branding – Packaging – Labeling – Warranties & Guarantees – New Product Development

UNIT III Understanding Pricing – Setting the Price – Types of Pricing Strategies – Initiating & Responding to the Price Changes

UNIT IV Role of Marketing Communication – Components of Promotion (Advertising, Sales Promotion, Personal Selling, Public Relations – Basic Concepts), Direct Marketing (Direct Mail, Catalogue, Tele Marketing),

UNIT V Importance of Marketing Channels – Functions – Channel Design – Channel Management – E-Commerce – Marketing Practices – Retailing – Types & Recent Trends – Wholesaling – Market Logistics – Managing Sales Force

TEXT/ REFERENCES

1. Philip Kotler, Kevin Lane, Abraham Koshy-Marketing Management – A South Asian Perspective-Pearson/Prentice Hall India Ltd
2. Rajan Saxena – Marketing Management-Tata McGraw Hill
3. Ramaswamy & Namakumary-Marketing Management-Global Perspective-Indian Context-Mac Millon India Ltd

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HUMAN RESOURCE MANAGEMENT

UNIT – I: HR Roles and Functions Human Resource Management - Introduction and Importance - Evolution - Difference between Personnel Management and HRM – HR functions - Structure of HR Department – Role, Duties and responsibilities of HR manager- HRD System – HR Strategies and organisational Strategies.

UNIT - II: Human Resources planning and recruitment Objectives-Importance-HRP Process- Manpower Estimation-Job analysis-Job Description-Job Specification - Recruitment-Sources of Recruitment-Selection Process-Placement and Induction-Retention of Employees- merit rating – promotion – transfers- job enlargement – job enrichment – job rotation.

UNIT – III: Training and Development and performance appraisal Training and Development - Training Process and Methodology - Need and objectives - Training procedure - Methods of Training - Evaluation of Training programmes Performance Management System - Definition, Concepts and Ethics-Different methods of Performance Appraisal- Rating Errors-Competency management – Career Planning.

UNIT – IV: Compensation Management Concepts and Components- Compensation Plan - Reward – Motivation - job evaluation - Fringe benefits and services - Employee Welfare – retirement /Separation - Kinds of Retirement - Resignation, Discharge, Dismissal, Suspension, Retirement, Layoff, Voluntary Retirement / Separation Schemes, Golden handshake.

UNIT – V: Industrial Relations Factors influencing industrial relations - State Interventions and Legal Framework - Role of Trade unions - Collective Bargaining - Workers' participation in management- time management – Corporate Social Responsibility.

TEXT REFERENCES

1. Decenzo & Robbins, Personnel / Human Resource Management, 7rd ed., John Wiley & Sons (Pvt.) Ltd.
Anne-wil Harzing & Joris Van Kuyss eveldt(eds.), International Human Resource Management - Sage Publications, New Delhi.
2. Biswajeet Patanayak, Human Resource Management, PHI, New Delhi
3. Luis R. Gomez, Mejia, Balkin and Carly, Managing Human Resources PHI, New Delhi.
4. Rudrabasavaraj, Dynamics of Personnel Admn. Himalaya Publishing House, Mumbai
5. Personnel Management – C.B Mamoria
6. Human Resources Management – Ashwathappa


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REINSURANCE

UNIT - I

Reinsurance: Introduction – Nature of reinsurance – Functions of reinsurance – Methods of reinsurance – Proportional : Quote share – Surplus – facultative obligatory – Non-Proportional : Excess of Loss – per Risk – Catastrophe – Stop Loss / Aggregate – Excess of Loss Law relating to reinsurance contracts – Fundamentals of Contract Law as applicable to reinsurance – Insurance and reinsurance contracts – Reinsurance documentation – Setting Retentions – General considerations and factors that influence retention – determining retentions for various classes of business – Property – Liability – Marine – Aviation.

UNIT - II

Programme design – Analysing reinsurance needs – Needs based on business strategy – financial needs – needs based on management style and attitude – construction of reinsurance programme – Negotiation and placement of reinsurance – direct placement – placement through intermediaries – role of intermediaries – advantages and disadvantages of direct placement and dealing through intermediaries.

UNIT - III

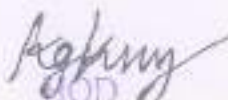
Reinsurance clauses: Common clauses – Operative Clause – Commencement and Termination Clause – Access to Records Clause – Errors and Omissions Clause – Intermediary Clause – Offset Clause – Claims Settlement Clause – Accounting Clause – Certain Special Clauses – Net Retained Lines Clause – Retention and Limits Clause – Ultimate Net Loss Clause – Loss Occurrence Clause – Reinstatement Clause – Cut-through Endorsement.

UNIT - IV

Reinsurance Accounting – Special nature of reinsurance accounts – formats of reinsurance accounting – Taxation aspects – Special Characteristics of certain important reinsurance markets – Reinsurance Exchanges – pools – Reinsurer Financial Security – Importance – Managing reinsurer security – Selecting reinsurers – Establishing criteria for evaluation of security – Financial Strength Ratings – Major rating agencies.

UNIT - V

Alternatives to reinsurance – new forms of reinsurance – Finite Risk / Financial Reinsurance – Reinsurance of Futures and Securitisation of reinsurance contracts – New markets – Impact of captives and high self-retentions on the reinsurance mechanism – Emerging trends in global reinsurance markets – Inward Reinsurance Business – need for inward business – Objectives – Business Strategy – Retrocession arrangements – Reciprocal trading.


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AGRI BUSINESS MANAGEMENT

SEMESTER I

AGRI BUSINESS ENVIRONMENT AND POLICY

UNIT I Role of agriculture in Indian economy; problems and policy changes relating to farm supplies, farm production, agro processing, agricultural marketing, agricultural finance etc. in the country.

UNIT II Structure of Agriculture - Linkages among sub-sectors of the Agribusiness sector; economic reforms and Indian agriculture; impact of liberalization, privatization and globalization on Agri business sector.

UNIT III Emerging trends in production, processing, marketing and exports; policy controls and regulations relating to the industrial sector with specific reference to agro


industries.

UNIT IV Agribusiness policies- concept and formulation; and new dimensions in Agri business environment and policy.

UNIT V Agricultural price and marketing policies; public distribution system and other policies.

Suggested Readings

Aswathy M. 1986. *Economic Environment of Business*. S. Chand & Sons.
Aswathy M. K. 1997. *Essentials of Business Environment*. Himalaya Publ.
Francis Cherian 2003. *Business Environment*. Himalaya Publ.


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COURSE: CERTIFICATES IN BUSINESS WRITING

Subject Code: 19002CCBW

AIMS: To emphasis better performance than the overall Business writing

Objectives:

- After successfully completing this week's activities, you should be able to:
Apply knowledge of sentence grammar to produce effective, correct, and rhetorically appropriate sentence constructions.
- Identify personal areas for improvement in common grammar, punctuation, and syntax errors.

OUTCOMES:

- The ability to compile the writing in a logical sequence. A guide to help recognize, and eliminate, common errors in business writing.
- The ability to focus on the main purpose of the communication. The skills to maintain clarity in preparing business communication.

UNIT-1

Business Writing Fundamentals

- What is "business English?"
- Sentence grammar and punctuation
Sentence theory

UNIT-2

Genres of Office Communication

- You-attitude and the rhetorical situation
- Basic document design

UNIT-3

Workplace Communication Case Study: Research Set-up

- Proposals in business writing
- Ethics in professional research

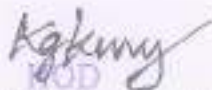
UNIT-4

Workplace Communication Case Study: Written Report

- Features, purposes, and design of short reports

UNIT-5

- Short Reports: Features, Purposes, and Design prerecorded mini lecture


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SCHOOL OF ARTS AND SCIENCE

DEPARTMENT OF ENGLISH

BOARD OF STUDIES (BOS) MEETING CIRCULAR

Date: 22-04-2019

There will be a Department Academic Committee Meeting on 30-04-2018 at 10 am in festaff room. All the staff members are requested to attend the meeting.

Agenda:

Curriculum
Feedback
Academic Calendar
Department
Activities Workload
Time table
Others

Chairman of the Board of Studies

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Attendance of the BOS & Staff members: The following members were present:

S.N.O	NAME	Designation & Affiliation	SIGNATURE
1	Dr.K.Shibila	HOD, English- PRIST A&S	K. Shibila
2	Dr. Joesh Durairaj	Prof. Head ,Ghandhigram Rural Institute, Dindugal	Joesh Durairaj
3	Dr. Vinod	Prof. Head School of English and foreign languages Bharathidasan University, Thiruchirapalli.	Dr. Vinod
4	Dr. N. Meenurajathi	Professor -PRIST	Dr. N. Meenurajathi
5	Dr. R.A. Rajasekaran	Professor - PRIST	Dr. R.A. Rajasekaran
6	Dr. N.Prema	Associate Professor-PRIST	Dr. N.Prema
7	Dr.D.Ravikumar	Associate Professor-PRIST	Dr. Ravikumar
8	R.Vishalakshi	Assistant Professor- PRIST	R. Vishalakshi
9	Banulakshmi Paladugu	Assistant Professor- PRIST	Banulakshmi Paladugu
10	Dr. K.Saravanan	DEAN, Prof. PRIST Deemed to be University	Dr. K.Saravanan
11	J.Helan Ezhilarasi	Tutor at GAIUS Learning Centre,Budalur	Helan ezhilarasi
12	A.Nivethitha	STUDENT	Nivethitha

K. Shibila
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Dr. K. Saravanan
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MINUTES OF THE MEETING

The meeting of the board of studies for UG and PG in English was held on 30.04.2019 at 10.am in the staff room under the Chairmanship of Dr.Shibila, Head of the Department of English.

The Board of studies for UG and PG in English welcomed the members and briefed about the curriculum. The committee scrutinized the curriculum and syllabi for the UG and PG English in detail and recommended for the following suggestions.

- To have programme exit examination for B.A and M.A English Programmes
- To classify the courses for B.A and M.A English Programmes as core elective foundation courses
- To record environmental studies and Indian constitution courses as non credit courses
- CIA components – Weekly Test I – 20% + Weekly Test II- 20% + Pre Semester - 20% + MCQ – 20 Marks +Assignments/Activity -20% = 100.
- Contents for certain courses will be changed

S.N.O	COURSES	CHANGES
1	ENGLISH -I	Unit III, IV will be shuffled with Unit – I & II
2	ENGLISH -II	Unit II will be shuffled with Unit – I
3	COMMONWEALTH LITERATURE	Contents for unit – I and Unit – II will be changed

The committee resolved to recommend the following suggestions:

- To have programme exit examination for BA and MA English programmes
- To classify the courses for B.A., English and M.A., English programmes as core,elective, foundation courses.
- To regard Environmental studies and Indian Constitution courses as non-creditcourses.
- To consider spoken English as UG-Certificate course and public speaking as diploma course as Add-on courses.
- To have CIA components - Weekly Test I- 15% + Weekly Test II -15% + Pre-semester - 30% +MCQ-20 marks + Assignments / Activity-20 marks = 100.

K. Shibila

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Members of the Board updated the panel of examiners and submitted the same to the Academic Council for its approval. We introduce new courses for the skill enhancement of the students as per the guidance and suggestions of the BOS panel.

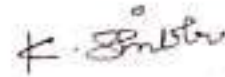
Tamil Ilakkiya Vuralaru

Banking Services

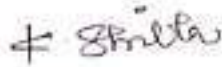
Wild Life Conservation

Asian Literature in English

The Board updated the panel of the examiners and submitted to the academic council for the approval. The chairperson of the board of studies proposed the vote of thanks.



Chairman of the Board of Studies



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REVIEW OF CURRICULUM & SYLLABUS in BA ENGLISH-REGULATION 2019

Resolved to change the content for the following courses:

- The contents of UNIT I, II, III & IV in English I with 17111AEC12 code has been shuffled with Unit I, II, III & IV in English I with 17211DSC44A code

UNIT -I

Because I could not Stop for Death -Emily
Dickinson Stopping by Woods on a Snowy Evening -
Robert Frost

UNIT - II

Enterprise -Nissim Ezekiel
Love poem for a wife-A.K Ramanujam

UNIT -III

The Art of Reading- Lin Yutang
An Eco-Feminist Vision-Aruna Gnanadason

UNIT -IV

The Merchant of Death -Nanda Kishore Mishra & John Kennet
She Spoke for all Nature -Young world 'The Hindu'

- -The contents of UNIT I, II in English IV with 17111AEC42 code has been shuffled with Unit I & II in English IV with 19111AEC42 code

UNIT -I

My Last Duchess -Robert Browning
The Toys -Coventry
Patmore
I, too -Langston
Hughes

UNIT -II

How to be a Doctor-Stephen Leacock
My Visions for Indi-A.P.J. Abdul Kalam
Woman, not the weaker sex -M.K. Gandhi

- The contents of UNIT I, II in Commonwealth Literature with 17111AEC63 code has been changed to the following with Unit I, II in Commonwealth Literature with 19111AEC63 code

UNIT - I

The Dying Eagle -E.J. Pratt
Fire at Murdering Hut -Judith
Wright

UNIT-II

Relationships -Jayant
Mahapatra My Daughter's Boyfriend- Razia
Khan

Resolved to introduce the following new additional open elective courses:

191100EC-Tamil Eilakkiya

Varalaru

191610EC/191980EC-

Banking

19165192300EC-Wildlifeconservation

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REVIEW OF CURRICULUM & SYLLABUS in MA ENGLISH REGULATION 2019

Resolved to introduce the following New Courses:

19211AEC25B-Asian literature in English

Resolved to change the content for the following courses:

- The contents of UNIT I & II-in History of English language and structure with 17211AEC11 code has been changed to the following in History of English language and structure with 19211AEC11 code

UNIT - I

The origin of language
The descent of the English language
Laws of language

UNIT - II

The Old English period
-The contents of

UNIT I, II & III-in Romantic movement with 17211DSC15A code has been changed to the following in Romantic Movement with 19211DSC15A code

UNIT-I

Romanticism- Characteristics, origin and growth of the movement-British Literature

UNIT-II

Romanticism- Characteristics, origin and growth of the movement-American Literature, Indian Writing in English

UNIT-III

Ode to Intimation on Immortality - Wordsworth
La Belle Dame Sans Merci -Keats
To a Skylark-Shelley

- The contents of UNIT IV & V in Romantic Movement with 17211DSC15A code has been shuffled with Unit IV and Unit V in Romantic Movement with 19211DSC15A code

UNIT-IV

The Philosophy of Composition - Edgar
Allan Poe A Red, Red Rose -Robert
Burns
The Rhodora -Ralph Waldo
Emerson

UNIT-V

The Lotus- Toru Dutt
The Snake Charmer - Sarojini Naidu
Transformation - Sri. Aurobindo

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- -The contents of UNIT I, II, III & IV in Indian Writing in English with 17211AEC14 code has been changed to the following in Indian Writing in English with 19211AEC14 codes

UNIT I

Origin and growth of Indian Literature -
Poetry, Prose

UNIT II

Origin and growth of Indian Literature - Novel,
Drama

UNIT III

Rumination - Daruwallah
Poet, Lover and Bird - Watcher-Ezekiel
A Hot Noon in Malabar Kamala Das

UNIT IV

My Experiments with Truth -
M.K. Gandhi That Long Silence - Shashi
Despandae

- -The contents of UNIT I, II, III & IV in American Literature with 17211AEC23 code has been changed to the following in American Literature with 19211AEC32 code

UNIT I

Origin and growth of American Literature- Poetry,
Prose

UNIT II

Origin and growth of American Literature- Novel and
Drama

UNIT III

Daddy-Sylvia Plath
After Apple Picking -
Robert Frost Helen -
Edger Allen Poe

UNIT IV

The American Scholar Emerson
Walden-The Battle of Ants -
Thoreau Farewell to Arms - Hemingway

**Resolved to change in second semester diasporic literature from
discipline specific elective to core course**

Resolved to introduce the following new additional open elective courses:

192610EC-Financial Service
192150EC-Herbal medicine

F. Srinivas
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REVIEW OF CURRICULUM & SYLLABUS in MPhil ENGLISH-REGULATION 2019

Resolved to change the contents for the following courses:

- The contents of UNIT I, II, III, IV & V in Research Methodology and theory of literature with 153ENC11 code has been changed to the following in Research Methodology and theory of literature with 193ENC11 code

UNIT-1

Research, Types of
Research Planning the
thesis

Writing the thesis- General format, Chapter
format

UNIT-II

Mechanics of writing

Documentation-Quotation, Works cited,
Bibliography

UNIT-III

Discourse:

Narration, Argumentation, Exposition, Description

UNIT-IV

Computer uses in research

Modern technology applied in
research Statistical techniques and
data analysis

UNIT-V

The Extrinsic approach to the study of literature-Literature and biography, literature and
psychology, literature and society

The Intrinsic approach to the study of literature-The mode of existence of a literary work of art,
Thenature and modes of narrative fiction.

-The contents of

UNIT II, IV & V in Modern Criticism and Fiction with 173ENC12 code has been changed to the
following in Modern Criticism with 193ENC13A code

UNIT - II

"Structuralism and Literature"-Jonathan Culler

"Towards Feminist Poetics"-Elaine Showalter

"The Seven Types of Ambiguity" -William Empson

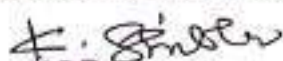
UNIT - IV

"Is there a text in the class?" -

Stanley Fish "Orientalism" -

Edward Said

"Cultural Studies and its Theoretical Legacies"- Stuart Hall


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UNIT - V

"What is an Author?" - Michael Foucault
"Post-colonial Criticism" - Homi
Bhabha "Can the Subaltern Speak" - Gayatri
Spivak

Resolved to change Literary Theory with code 17311ENC13A to Literary Theory with 19311ENC12

VALUE ADDED COURSES

- Spoken English
- Public speaking
- Journalism
- Mass Communication

SPOKEN ENGLISH

Objectives: To speak fluently
To gain confidence to communicate
Course Content:

UNIT I: Phonetics

UNIT II: LSRW TRAINING

UNIT III: Speak about a movie, book, incident, thing, person, place, or any current issue

UNIT IV: Story narration

UNIT V: Conversation

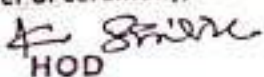
PUBLIC SPEAKING

Objectives: Speak fluently in public


Course Content:

UNIT I- Personality development-grooming, eye contact, body language

UNIT II- Master of ceremony, welcome address, vote of thanks, news

reading 
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UNIT III- Conversation, Group discussion

UNIT IV- Making presentation

UNIT V- Oration

Recommended Reading:

Julius Caesar - Funeral oration

The Merchant of Venice- Portia's speech, Paradise Lost- Book- II- Satan's speech, American Taxation- Edmond Burke, The rise and fall of the Roman

JOURNALISM

Objectives: To become a journalist

Course Content:

UNIT I: Journalism, Ethics, Press, News

UNIT II: Quality of reporters, kinds of reporting

UNIT III: Editing, News Editor, Subeditor

UNIT IV: Features & its role

UNIT V: Language of journalism

MASS COMMUNICATION

Objectives: To know about mass communication

Course Content:

UNIT I: Mass communication In India, Barriers to Mass communication

UNIT II: Print media, Audio visual media

UNIT III: Role of journalism, elements of news and its kinds

UNIT IV: Quality of reporter, Quality of editor and subeditor

UNIT V: Writing reviews, headlines, Advertisements



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The committee resolved to recommend the following suggestions:

- To have programme exit examination for BA and MA English programmes
- To classify the courses for B.A., English and M.A., English programmes as core, elective, foundation courses.
- To regard Environmental studies and Indian Constitution courses as non-credit courses.
- To consider spoken English as UG-Certificate course and public speaking as diploma course as add-on courses.
- To have CIA components - Weekly Test I- 15% + Weekly Test II -15% + Pre-semester - 30% + MCQ-20 marks + Assignments / Activity-20 marks = 100.

Members of the Board updated the panel of examiners and submitted the same to the Academic Counsel for its approval.

Annexure I- Revised Curriculum structure and Syllabus of BA
 Annexure II- Revised Curriculum structure and Syllabus of MA
 Annexure III - Revised Curriculum structure and Syllabus of MPhil
 Annexure IV- List of Examiners.

The Meeting concluded with thanks from Board of Studies Chairman.

- To have programme exit examination for B.A and M.A English Programmes
- To classify the courses for B.A and M.A English Programmes as core elective foundation courses
- To record environmental studies and Indian constitution courses as non credit courses
- CIA components – Weekly Test I – 20% + Weekly Test II- 20% + PreSemester - 20% + MCQ – 20 Marks + Assignments/Activity -20% = 100.
- Contents for certain courses will be changed

S.N.O	COURSES	CHANGES
1	ENGLISH -I	Unit III, IV will be shuffled with unit - I & II
2	ENGLISH -II	Unit II will be shuffled with unit - I
3	COMMONWEALTH LITERATURE	Contents for unit - I and unit - II will be changed

The board updated the panel of the examiners and submitted to the academic council for the approval. The chairperson of the board of studies proposed the vote of thanks.



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DEPARTMENT OF ENGLISH
2017- 2018

B.A ENGLISH LITERATURE - REGULATION 2017

COURSE STRUCTURE

Course Code	Course Title	L	T	P	C
SEMESTER I					
17110AEC11/ 17111AEC11/ 17132AEC11/ 17135AEC11	Language-I(Tamil-I/ Advanced English-I/ Hindi-I/ French-I)	4	0	0	2
17111AEC12	English-I	4	0	0	2
17111AEC13	Literature in 1400-1600 Period	4	0	0	4
17111AEC14	Literature in Elizabethan Period	4	0	0	4
17111AEC15	Social History of England-I	5	0	0	4
17111AEC16	History of English Literature-I	5	0	0	4
17ISEC01	Skill Based Elective-I	0	0	2	1
17111SEC01L	Communicative English Lab -I	0	0	1	1
171INDCONS	Indian Constitution	1	0	0	1
	Total	27	0	3	23
SEMESTER II					
17110AEC21/ 17111AEC21/ 17132AEC21/ 17135AEC21	Language-II(Tamil-II/ Advanced English-II/ Hindi-II/ French-II)	4	0	0	2
17111AEC22	English-II	4	0	0	2
17111AEC23	Literature in Jacobean Period	4	0	0	4
17111AEC24	Literature in Restoration Period	4	0	0	4
17111AEC25	Social History of England-II	5	0	0	4
17111AEC26	History of English Literature-II	5	0	0	4
17111RLC27	Research Led Seminar	-	-	-	1
17ISEC02	Skill Based Elective-II	0	0	2	1
17111SEC02L	Communicative English Lab -II	0	0	2	1
	Total	26	0	4	23
SEMESTER III					
17110AEC31/ 17111AEC31/	Language-III(Tamil-III/ Advanced English-III/	4	0	0	2

K. Sathya
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17132AEC31/ 17135AEC31	Hindi-III/ French-III)				
17111AEC32	English-III	4	0	0	2
17111AEC33	Literature in Augustan Period	4	0	0	4
17111AEC34	Literature in Romantic Period	4	0	0	4
17111SEC35	Literary Forms and Prosody	4	0	0	5
17111AEC36	Shakespeare	3	0	0	3
17111RMC37	Research Methodology	3	0	0	3
171SEC03	Skill based Elective-III	0	0	2	1
17111SEC03L	Communicative English Lab-III	0	0	2	1
	Total	26	0	4	25
	SEMESTER IV				
17110AEC41/ 17111AEC41/	Language-IV(Tamil-IV/ Advanced English-IV/	4	0	0	2
17132AEC41/ 17135AEC41	Hindi-IV/ French-IV)				
17111AEC42	English-IV	4	0	0	2
17111SEC43	Language and Linguistics	4	1	0	5
17111AEC44	Literature in Victorian Period	4	0	0	4
17111AEC45	Literary Criticism	5	0	0	5
17111AEC46	Indian and European Classics in Translation	4	0	0	4
171SEC04	Skill based Elective-IV	0	0	2	1
17111SEC04L	Communicative English Lab-IV	0	0	1	1
171ENV1STU	Environmental Studies	1	0	0	1
	Total	26	1	3	25
	SEMESTER V				
17111AEC51	Literature in Modern Period-I	5	0	0	4
17111AEC52	American Literature	5	0	0	5
17111AEC53	Indian Writing in English	5	0	0	5
17111SEC54	Translation	5	1	0	5
17111DSC55	Discipline Specific Elective -I	5	0	0	4
17111BRC56	Participation in Bounded research	-	-	-	2
171SEC05	Skill based Elective-V	0	0	2	1
17111SEC05L	Communicative English Lab-V	0	0	2	1
	Total	25	1	4	27
	SEMESTER VI				
17111AEC61	Literature in Modern Period-II	5	0	0	4
17111SEC62	English Language Teaching	5	1	0	5
17111AEC63	Common wealth Literature	5	0	0	5
17111DSC64	Discipline Specific Elective -II	5	0	0	4
171GEC	General Elective	4	0	0	2
17111PRW66	Project Work	-	-	-	4
171SEC06	Skill based Elective-VI	0	0	2	1
17111SEC06L	Communicative English Lab-VI	0	0	2	1
17111EXACT	Extension Activities				1

K. Srinivas
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	Total	24	1	4	27
	Total Credits for the Programme				150

Discipline Specific Electives

Semester	Discipline Specific Elective Courses
V	a) 1711DSC55A-SingleAuthorStudy-Tagore b) 1711DSC55B-SingleAuthorStudy-OliverGoldsmith
VI	a) 1711DSC64A-Studyofagenre-Poetry b) 1711DSC64B-Studyofagenre-Novel

Open Electives

Semester	Open Elective Courses
V	a) 17112GEC-DevelopmentofMathematicalSkills b) 17113GEC-Instrumentation c) 17114GEC-FoodandAdulteration d) 17117GEC-MushroomTechnology e) 17120GEC-WebTechnology f) 17122GEC-E-Commerceanditsapplication g) 17161GEC-IndirectTaxes

Skill based Electives

Semester	Skill based Elective Courses
I	a) 17120SEC01AL-PackageLab-I b) 17160SEC01B-Softskill-I
II	a) 17120SEC02AL-PackageLab-II b) 17160SEC02B-Softskill-II
III	a) 17120SEC03AL-PackageLab-III b) 17160SEC03B-Softskill-III
IV	a) 17120SEC04AL-PackageLab-IV b) 17160SEC04B-Softskill-IV
V	a) 17120SEC05AL-PackageLab-V b) 17160SEC05B-Softskill-V
VI	a) 17120SEC06AL-PackageLab-VI b) 17160SEC06B-Softskill-VI

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SCHOOL OF ARTS AND SCIENCE
DEPARTMENT OF ENGLISH
2019 - 2020

B.A ENGLISH LITERATURE - REGULATION 2019
COURSE STRUCTURE

Course Code	Course Title	L	T	P	C
SEMESTER I					
19110AEC11/ 19111AEC11/ 19132AEC11/ 19135AEC11	Language-I (Tamil-I/ Advanced English-I/ Hindi-I/ French-I)	4	0	0	2
19111AEC12	English-I				
19111AEC13	Literature in 1400-1600 Period	4	0	0	2
19111AEC14	Literature in Elizabethan Period	4	0	0	4
19111AEC15	Social History of England-I	4	0	0	4
19111AEC16	History of English Literature-I	5	0	0	4
191_SEC01	Skill Based Elective-I	5	0	0	4
19111SEC01L	Communicative English Lab-I	0	0	2	1
191HINDCONS	Indian Constitution	0	0	1	1
	Total	1	0	0	1
		27	0	3	23
SEMESTER II					
19110AEC21/ 19111AEC21/ 19132AEC21/ 19135AEC21	Language-II (Tamil-II/ Advanced English-II / Hindi-II/ French-II)	4	0	0	2
19111AEC22	English-II				
19111AEC23	Literature in Jacobean Period	4	0	0	2
19111AEC24	Literature in Restoration Period	4	0	0	4
19111AEC25	Social History of England-II	4	0	0	4
19111AEC26	History of English Literature-II	5	0	0	4
19111RLC27	Research Led Seminar	-	-	-	1
191_SEC02	Skill Based Elective -II	0	0	2	1
19111SEC02L	Communicative English Lab-II	0	0	2	1
	Total	0	0	2	1
		26	0	4	23
SEMESTER III					

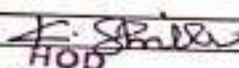
19110AEC31/ 19111AEC31/ 19132AEC31/ 19135AEC31	Language-III (Tamil-III/ Advanced English-III / Hindi-III/ French-III)	4	0	0	2
19111AEC32 HOD	English-III	4	0	0	2

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19111AEC31	Literature in Augustan Period	4	0	0	4
19111AEC34	Literature in Romantic Period	4	0	0	4
19111SEC35	Literary Forms and Prosody	4	0	0	4
19111AEC36	Shakespeare	4	0	0	4
19111RMC37	Research Methodology	3	0	0	3
191_SEC03	Skill based Elective- III	3	0	0	3
19111SEC03L	Communicative English Lab-III	0	0	2	1
	Total	0	0	2	1
	SEMESTER IV	26	0	4	24
19110AEC41/ 19111AEC41/ 19132AEC41/ 19135AEC41	Language-IV (Tamil-IV/ Advanced English-IV/ Hindi-IV/ French-IV)	4	0	0	2
19111AEC42	English-IV				
19111SEC43	Language and Linguistics	4	0	0	2
19111AEC44	Literature in Victorian Period	4	1	0	5
19111AEC45	Literary Criticism	4	0	0	4
19111AEC46	Indian and European Classics in Translation	6	0	0	6
191_SEC04	Skill based Elective- IV	3	0	0	3
19111SEC04L	Communicative English Lab-IV	0	0	2	1
191ENVTSTU	Environmental Studies	0	0	1	1
	Total	1	0	0	1
	SEMESTER V	26	1	3	25
19111AEC51	Literature in Modern Period-I	4	0	0	4
19111AEC52	American Literature	5	0	0	5
19111SEC53	English Language Teaching	5	1	0	6
19111SEC54	Translation	5	1	0	5
19111DSC55	Discipline Specific Elective - I	5	0	0	4
19111BRC56	Participation in Bounded research	-	-	-	2
191_SEC05	Skill based Elective- V	0	0	2	1
19111SEC05L	Communicative English Lab-V	0	0	2	1
	Total	0	0	2	1
	SEMESTER VI	24	2	4	28
19111AEC61	Literature in Modern Period-II	4	0	0	4
19111AEC62	Indian Writing in English	5	0	0	5
19111AEC63	Commonwealth Literature	5	0	0	5
19111DSC64	Discipline Specific Elective -II	5	0	0	4
191_OEC	Open Elective	4	0	0	2
19111PRW66	Project Work	-	-	-	4
191_SEC06	Skill based Elective- VI	0	0	2	1

19111SEC06L	Communicative English Lab-VI	0	0	2	1
19111EXACT	Extension Activities	-	-	-	1
19111PEE	Programme Exit Examination	-	-	-	2
	Total	23	0	4	29
	Total Credits for the Programme				152


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Discipline Specific Electives	
Semester	Discipline Specific Elective Courses
V	a) 19111DSC55A-Single Author Study-Tagore b) 19111DSC55B-Single Author Study-Oliver Goldsmith
VI	a) 19111DSC64A-Study of a genre-Poetry b) 19111DSC64B-Study of a genre-Novel

Open Electives	
Semester	Open Elective Courses
V	a) 19112OEC-Development of Mathematical Skills b) 19113OEC-Instrumentation c) 19114OEC-Food and Adulteration d) 19117OEC-Mushroom Technology e) 19120OEC-Web Technology f) 19122OEC-E-Commerce and its application g) 19161OEC-Indirect Taxes

Skill based Electives	
Semester	Skill based Elective Courses
I	a) 19120SEC01AL-Package Lab - I b) 19160SEC01B-Soft skill - I
II	a) 19120SEC02AL-Package Lab - II b) 19160SEC02B-Soft skill - II
III	a) 19120SEC03AL-Package Lab -III b) 19160SEC03B-Soft skill - III
IV	a) 19120SEC04AL-Package Lab -IV b) 19160SEC04B- Soft skill - IV
V	a) 19120SEC05AL-Package Lab -V b) 19160SEC05B-Soft skill - V
VI	a) 19120SEC06AL-Package Lab -VI b) 19160SEC06B-Soft skill - VI

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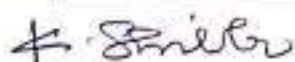
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MA ENGLISH LITERATURE -SYLLABUS – REGULATION 2017

COURSE STRUCTURE

Course Code	Course Title	L	T	P	C
SEMESTER I					
17211AEC11	History of English Language and Structure	6	0	0	4
17211AEC12	Shakespeare	5	0	0	4
17211AEC13	British Literature	5	0	0	4
17211AEC14	Indian Writing in English	5	0	0	4
17211DSC15	Discipline Specific Elective – I	5	0	0	4
17211RLC16	Research Led Seminar	-	-	-	1
	Total	26	0	0	21
SEMESTER II					
17211AEC21	Women's writing in English	5	0	0	4
17211AEC22	Post-Colonial literature	6	0	0	4
17211AEC23	Comparative Literature & World Classics in Translation	6	0	0	4
17211DSC24	Discipline Specific Elective – II	5	0	0	4
17211RMC25	Research Methodology	3	0	0	3


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17211BRC26	Participation in Bounded Research	-	-	-	2
	Total	25	0	0	21
	SEMESTER III				
17211SEC31	Critical Approaches to English Literature	5	0	0	5
17211AEC32	American Literature	5	0	0	5
17211AEC33	Literary Criticism	6	0	0	5
17211DSC34_	Discipline Specific Elective – III	5	0	0	4
172_GEC	General Elective	4	0	0	2
17211SRC36	Participation in Scaffold Research (Societal Project)	-	-	-	2
	Total	25	0	0	23
	SEMESTER IV				
17211SEC41	Translation	5	1	0	5
17211SEC42	English Language Teaching	4	1	1	5
17211AEC43	English Literature for Competitive Examination	6	0	0	5
17211DSC44_	Discipline Specific Elective – IV	5	0	0	4
17211PRW45	Project Work	0	0	0	6
	Total	20	2	1	25
	Total Credits for the Programme				90

Discipline Specific Electives

Semester	Discipline specific Elective Courses
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I	a)17211DSC15A-Romantic Movement b)17211DSC15B- Literary Movement
II	a)17211 DSC24A- Canadian Literature b)17211 DSC24B- Diaspora literature
III	a)17211 DSC34A- African Literature b)17211 DSC34B- Popular Literature
IV	a)17211 DSC44A- Australian Literature b)17211 DSC44B- Indian Fiction in Translation

General Electives

Semester	General Elective Courses
III	a) 17212GEC-Applicable Mathematics Techniques b) 17213GEC-Bio-medical Instrumentation c) 17214GEC-Green Chemistry d) 17215GEC-Bio-analytical Techniques e) 17220GEC-Internet and Web Design f) 17261GEC- Insurance Services g) 17280GEC-Counselling Psychology

Value added Courses

Certificate course on Spoken English
Diploma course on Public Speaking and Journalism

SPOKEN ENGLISH

Objectives: To speak fluently

To gain confidence to communicate

Course Content:

UNIT I: Phonetics

UNIT II: LSRW TRAINING

K. Shreya
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UNIT III: Speak about a movie, book, incident, thing, person, place, or any current issue

UNIT IV: Story narration

UNIT V: Conversation

PUBLIC SPEAKING

Objectives: Speak fluently in public

Course Content:

UNIT I- Personality development-grooming, eye contact, body language

UNIT II- Master of ceremony, welcome address, vote of thanks, news reading

UNIT III- Conversation, Group discussion

UNIT IV- Making presentation

UNIT V- Oration

Recommended Reading:

Julius Caesar - Funeral oration

The Merchant of Venice- Portia's speech, Paradise Lost- Book- II- Satan's speech, American Taxation- Edmond Burke, The rise and fall of the Roman Empire- Gibbon

DIPLOMA IN JOURNALISM

Objectives: To become a journalist

Course Content:

UNIT I: Journalism, Ethics, Press, News

UNIT II: Quality of reporters, kinds of reporting

UNIT III: Editing, News Editor, Subeditor



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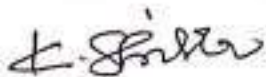


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UNIT IV: Features & its role

UNIT V: Language of journalism


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M.A ENGLISH LITERATURE - CURRICULUM - REGULATION 2019

COURSE STRUCTURE

Course Code	Course Title	L	T	P	C
SEMESTER I					
19211AEC11	History of English Language And Structure	6	0	0	4
19211AEC12	Shakespeare	5	0	0	4
19211AEC13	British Literature	5	0	0	4
19211AEC14	Indian Writing in English	5	0	0	4
19211DSC15	Discipline Specific Elective-I	5	0	0	4
19211RLC16	Research Led seminar	-	-	-	1
	Total	26	0	0	21
SEMESTER II					
19211AEC21	Women's writing in English	5	0	0	4
19211AEC22	Post Colonial literature	6	0	0	4
19211AEC23	Comparative Literature & World Classics in Translation	6	0	0	4
19211DSC24	Discipline Specific Elective-II	5	0	0	4
19211RMC25	Research Methodology	3	0	0	3
19211BRC26	Participation in Bounded Research	-	-	-	2
	Total	25	0	0	21
SEMESTER III					
19211SEC31	Critical Approaches to English Literature	5	0	0	5
19211AEC32	American Literature	5	0	0	5
19211AEC33	Literary Criticism	6	0	0	5
19211DSC34	Discipline Specific Elective-III	5	0	0	4
192OEC	Open Elective	4	0	0	2
19211SRC36	Participation in Scaffold Research (Societal Project)	-	-	-	2
	Total	25	0	0	23
SEMESTER IV					
19211SEC41	Translation	5	1	0	5
19211SEC42	English Language Teaching	4	1	1	5
19211AEC43	English Literature For Competitive Examination	6	0	0	5
19211DSC44	Discipline Specific Elective-IV	5	0	0	4
19211PRW45	Project Work	0	0	8	6
19211PHE	Programme Exit Examination	0	0	0	2

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	Total	20	2	1	27
	Total Credits for the Programme				92

Discipline Specific Electives

Semester	Discipline Specific Elective Courses
I	a) 19211DSC15A-Romantic Movement b) 19211DSC15B-Literary Movement
II	a) 19211DSC24A-Canadian Literature b) 19211DSC24B-Diasporal Literature
III	a) 19211DSC34A-African Literature b) 19211DSC34B-Popular Literature
IV	a) 19211DSC44A- Australian Literature b) 19211DSC44B-Indian Fiction in Translation

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UNIT IV: Features & its role

UNIT V: Language of journalism



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DEPARTMENT OF ENGLISH

M.Phil ENGLISH LITERATURE-2017 REVISED COURSE STRUCTURE

Course Code	Course Title	C	Marks
Semester I			
173ENC11	Research Methodology and Theory of Literature	5	100
173ENC12	Literary Theory	5	100
173ENC13-	Elective	5	100
	Total	15	300
Semester II			
173END21	Dissertation	15	100
	Total	15	100
	Total	30	400

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DEPARTMENT OF ENGLISH

M.PHIL ENGLISH LITERATURE-2019 REVISED COURSE STRUCTURE

Course Code	Course Title	C	Marks
Semester I			
193ENC11	Research Methodology and Theory of Literature	5	100
193ENC12	Literary Theory	5	100
193ENC13-	Elective	5	100
	Total	15	300
Semester II			
193END21	Dissertation	15	100
	Total	15	100
	Total	30	400

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Date: 03.04.2019

**DEPARTMENT OF MATHEMATICS
BOARD OF STUDIES MEETING CIRCULAR**

There will be board of studies meeting on 10.04.2019 at 11:00 a.m in the department of Mathematics. All the staff members are requested to attend the meeting.

Agenda

1. Curriculum

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Date: 10.04.2019

School of Arts and Science
Department of Mathematics

Minutes of Board of Studies Meeting

The Board of Studies meeting for the department of Mathematics is held on 10.04.2019 at 10:30 a.m. in the department, PRIST Deemed to be University, Thanjavur under the chairmanship Dr.S.Subramanian Prof & HOD (Chairman, BOS)

The following members were present:

1. Dr.S.Subramanian /Prof & HOD (Chairman, BOS)
2. Dr.K.Saravanan /Dean (EX-Offico,BOS)
3. Dr.S.Udayakumar, Professor of Mathematics, (Member, BOS)
4. Dr.R.Balakumar, Associate Professor of Mathematics, (Member, BOS)
5. Dr.K.Selvaraj, Assistant Professor of Mathematics, (Member, BOS)
6. Dr.R.Abirami, Assistant Professor of Mathematics, (Member, BOS)
7. Dr.S.Ramasubramanian / Prof (External Member, BOS)
8. Dr.B.Chellappa / Prof (External Member, BOS)

The members of the Board scrutinized the existing syllabi for B.Sc., Mathematics & M.Sc., Mathematics programme and have unanimously recommended to following suggestion.

- ❖ To have programme exit examination.

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To include some new courses in UG and PG

1. Integrals and Differential Equations
2. Mathematics statistics Lab – I
3. Mathematics statistics Lab – II
4. Graph Theory

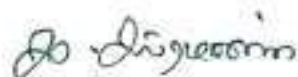
and some value added courses

1. introduction to Rings and fields
2. Quantitative Aptitude and reasoning
3. Maple
4. R-Programming
5. Mathematics for Competitive Examinations
6. Sagmath

- ❖ To introduce experiential learning.
- ❖ To classify the courses for B.Sc., Mathematics and M.Sc., Mathematics programmes as core, elective, foundation courses.
- ❖ To regard Environmental studies and Indian Constitution as non-credit courses.
- ❖ CIA components- Weekly Test I-20% + Weekly Test II-20% + Pre Semester-20% + MCQ- 20 marks + Assignment /Activity- 20 marks = 100.

The members of the board also scrutinized and updated the panel of members for the B.Sc., Mathematics & M.Sc., Mathematics submitted the same for the academic council for its approval.

The meeting was concluded with vote of thanks by the chairman.



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2019-BOS

REVIEW OF CURRICULUM & SYLLABUS IN B.Sc.

REGULATION 2019

The following changes have been made in upcoming with respect to existing curriculum.

Inclusion of new Courses

1. Integrals and Differential Equations
2. Mathematical statistics Lab - I
3. Mathematical statistics Lab - II

Introduction of employability , entrepreneur (Assured Course)

1. Integrals and Differential Equations
2. Mathematical statistics Lab - I
3. Mathematical statistics Lab - II

REVIEW OF CURRICULUM & SYLLABUS in M.Sc Mathematics

The following changes have been made in upcoming with respect to existing curriculum.

Inclusion of new Courses

1. Graph Theory

Introduction of employability, entrepreneur (Assured Course)

1. Graph Theory

Members of the Board updated the panel of members and submitted the same to the academic counsel for its approval.

Annexure I	-	Revised Curriculum structure and Syllabus of UG.(FT/PT)
Annexure II	-	Revised Curriculum structure and Syllabus of PG.(FT/PT)
Annexure III	-	List of Members.

Note: Annexure I, II & III are Signed by Chairman of BOS


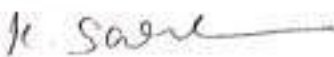
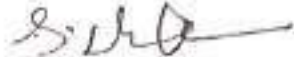
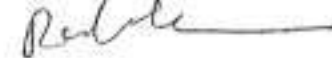
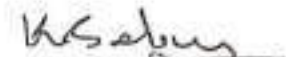
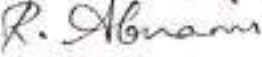
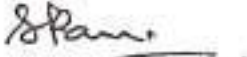
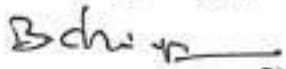
The Meeting concluded with thanks from Board of Studies Chairman.

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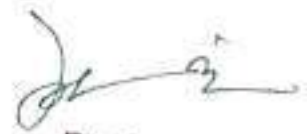
Signature of the Chairman & Members

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SCHOOL OF ARTS AND SCIENCE
DEPARTMENT OF MATHEMATICS

B.Sc., MATHEMATICS CURRICULUM

REGULATION 2019



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B.Sc., MATHEMATICS –SYLLABUS-REGULATION 2019
COURSE STRUCTURE

SEMESTER – I					
COURSE CODE	COURSE TITLE	L	T	P	C
19110AEC11/ 19111AEC11/ 19132AEC11/ 19135AEC11	Tamil – I / Advanced English – I / Hindi – I/ French- I	4	0	0	2
19111AEC12	English – I	4	0	0	2
19112AEC13	Differential Calculus and Vector Differentiation	4	1	0	4
19112AEC14	Trigonometry, Analytical Geometry 3D and Calculus	4	0	0	4
19120AEC15	Programming in C	6	0	0	6
19120AEC16L	Programming in C Lab	0	0	3	2
191__SEC01_	Skill Based Elective – I	0	0	2	1
191115EC01L	Communicative English Lab – I	0	0	1	1
191INDCONS	Indian Constitution	1	0	0	1
	Total	23	1	6	23

SEMESTER – II					
COURSE CODE	COURSE TITLE	L	T	P	C
19110AEC21/ 19111AEC21/ 19132AEC21/ 19135AEC21	Tamil – II / Advanced English – II /Hindi – II/ French- II	4	0	0	2
19111AEC22	English – II	4	0	0	2
19112AEC23	Differential Equations	4	1	0	4
19112AEC24	Vector integration and Classical Algebra	4	0	0	4
19120AEC25	Web Programming	6	0	0	6
19120AEC26L	Web Designing Lab	0	0	3	2
19112RLC27	Research LED Seminar	-	-	-	1
191__SEC02_	Skill Based Elective - II	0	0	2	1
191115EC02L	Communicative English Lab-II	0	0	2	1
	Total	22	1	7	23

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SEMESTER – III					
COURSE CODE	COURSE TITLE	L	T	P	C
19110AEC31/ 19111AEC31/ 19132AEC31/ 19135AEC31	Tamil –III /Advanced English – III/ Hindi- III/ French- III	4	0	0	2
19111AEC32	English – III	4	0	0	2
19112AEC33	Number Theory	5	0	0	5
19112AEC34	Numerical Analysis	4	0	0	4
19118AEC35	Mathematical Statistics I	3	0	0	3
19118AEC36	Mathematical Statistics II	3	0	0	3
19112RMC37	Research Methodology	3	0	0	3
191__SEC03	Skill Based Elective – III	0	0	2	1
19111SEC03L	Communicative English Lab- III	0	0	2	1
	Total	26	0	4	24

SEMESTER – IV					
COURSE CODE	COURSE TITLE	L	T	P	C
19110AEC41/ 19111AEC41/ 19132AEC41/ 19135AEC41	Tamil-IV /Advanced English- IV/ Hindi -IV/ French- IV	4	0	0	2
19111AEC42	English-IV	4	0	0	2
19112AEC43	Sequence and Series	4	0	0	4
19112SEC44	Operations Research	4	0	0	4
19112SEC45	Astronomy	4	0	0	4
19118AEC46	Mathematical Statistics III	3	1	0	3
19118AEC47L	Mathematical Statistics	0	0	1	3
191__SEC04	Skill based Elective – IV	0	0	2	1
19111SEC04L	Communicative English Lab -IV	0	0	1	1
191ENVTSTU	Environmental Studies	1	0	0	1
	Total	24	1	4	25

SEMESTER – V					
COURSE CODE	COURSE TITLE	L	T	P	C
19112AEC51	Modern Algebra	6	0	0	6
19112AEC52	Real Analysis	6	0	0	5
19112SEC53	Statics	4	1	0	5
19112SEC54	Programming in C++	4	0	0	4

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19112DSC55	Discipline Specific Elective -I	5	0	0	3
19112BRC56	Participation in Bounded Research	-	-	-	2
19112SEC05	Skill Based Elective -V	0	0	2	1
19111SEC05L	Communicative English Lab - V	0	0	2	1
	Total	25	1	4	27

SEMESTER - VI					
COURSE CODE	COURSE TITLE	L	T	P	C
19112AEC61	Complex Analysis	5	0	0	5
19112SEC62	Dynamics	4	0	0	4
19112AEC63	Discrete Mathematics	4	0	0	4
19120SEC64L	Programming in C++ Lab	0	0	3	2
19112DSC65	Discipline Specific Elective - II	5	0	0	4
19112OEC	Open Elective	4	0	0	2
19112PRWP67	Project Work	-	-	-	4
19112SEC06	Skill Based Elective -VI	0	0	2	1
19111SEC06L	Communicative English Lab-VI	0	0	2	1
19112EXACT	Extension activities	-	-	-	1
19112PEE	Programme Exit Examination	-	-	-	2
	Total	22	0	7	30
Total Credits of the Programme					152

DISCIPLINE SPECIFIC ELECTIVE COURSES

Semester	Elective No.	Course Code	Course Title
V	I	19112DSC55A 19112DSC55B	a) Fuzzy Analysis b) Formal Languages And Automata Theory
VI	II	19112DSC65A 19112DSC65B	a) Graph Theory b) Mathematical Modelling

OPEN ELECTIVE COURSE

Semester	Course Title
VI	a.19111OEC- Journalism b.19113OEC- Instrumentation c.19114OEC- Food and Adulteration d.19117OEC- Mushroom Technology e.19120OEC- Web Technology f.19122OEC- E-Commerce and its applications g.19161OEC- Indirect Taxes

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ALL BASED ELECTIVE COURSES

SEMESTER	SKILL BASED ELECTIVE NO.	COURSE CODE	COURSE TITLE
I	I	19120SEC01AL 19160 SEC01B	a) Package Lab I b) Soft Skill I
II	II	19120SEC02AL 19160 SEC02B	a) Package Lab II b) Soft Skill II
III	III	19120SEC03AL 19160 SEC03B	a) Package Lab III b) Soft Skill III
IV	IV	19120SEC04AL 19160 SEC04B	a) Package Lab IV b) Soft Skill IV
V	V	19120SEC05AL 19160 SEC05B	a) Package Lab V b) Soft Skill V
VI	VI	19120SEC06AL 19160 SEC06B	a) Package Lab VI b) Soft Skill VI

Credit Distribution

Sem	AEC	SEC	DSC	OEC	Research	NON CGP	Total
I	20	2	-	-	-	1	23
II	20	2	-	-	1	-	23
III	19	2	-	-	3	-	24
IV	14	10	-	-	-	1	25
V	11	11	3	-	2	-	27
VI	9	8	4	2	4	3	30
TOTAL	93	35	7	2	10	5	152

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M.Sc., MATHEMATICS – Regulation 2019
COURSE STRUCTURE

SEMESTER – I					
COURSE CODE	COURSE TITLE	L	T	P	C
19212AEC11	Algebra	6	0	0	4
19212AEC12	Real Analysis	7	0	0	4
19212AEC13	Ordinary Differential Equations	6	0	0	4
19220SEC14	C++ Programming	6	0	0	4
19212DSC15	Discipline Specific Elective-1	5	0	0	4
19212RLC16	Research Led Seminar	-	-	-	1
Total		30	0	0	21

SEMESTER – II					
COURSE CODE	COURSE TITLE	L	T	P	C
19212AEC21	Complex Analysis	5	1	0	3
19212AEC22	Measure Theory and Integration	5	0	0	3
19212SEC23	Mathematical Methods	6	0	0	3
19212AEC24	Differential Geometry	5	0	0	3
19212DSC25	Discipline Specific Elective- II	5	0	0	4
19212RMC26	Research Methodology	3	0	0	3
19212BRC27	Participation in Bounded Research	-	-	-	2
Total		29	1	0	21

SEMESTER – III					
COURSE CODE	COURSE TITLE	L	T	P	C
19212AEC31	Topology	6	0	0	5
19212SEC32	Stochastic Process	6	1	0	5
19212AEC33	Advanced Numerical Analysis	6	1	0	5
19212DSC34	Discipline Specific Elective –III	5	0	0	4
192 OEC35	Open Elective	4	0	0	2
19212SRC36	Participation in Scaffold Research (Design / Societal Project)	-	-	-	2
Total		27	2	0	23

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SEMESTER – IV						
COURSE CODE	COURSE TITLE	L	T	P	C	
19212AEC41	Functional Analysis	5	1	0	5	
19212SEC42	Visual Programming	6	1	0	5	
19212AEC43	Number Theory	6	0	0	5	
19212DSC44	Discipline Specific Elective – IV	5	0	0	4	
19212PRW45	Project Work	-	-	-	6	
19212PEE	Programme for Exit Examination	-	-	-	2	
Total		22	2	-	27	

DISCIPLINE SPECIFIC ELECTIVE COURSES

Semester	Elective No.	Course Code	Course Title
I	I	19212DSC15A 19212DSC15B	a) Classical Dynamics b) Fluid Dynamics
II	II	19212DSC25A 19212DSC25B	a) Mathematical Probability b) Mathematical Modelling
III	III	19212DSC34A 19212DSC34B	a) Cryptography b) Algebraic Coding Theory
IV	IV	19212DSC44A 19212DSC44B	a) Combinatorial Mathematics b) Design And Analysis of Algorithm

OPEN ELECTIVES COURSE

Semester	OPEN ELECTIVE COURSES
III	a. 17211OEC - Writing For The Media b. 17213OEC – Bio medical instrumentation c. 17214OEC –Green Chemistry d. 17215 OEC – Bio analytical Techniques e. 17220OEC - Internet and Web Design f. 17261OEC - Insurance Services g. 17280OEC - Counselling and Psychology

Credit Distribution

Sem	AEC	SEC	DSC	OEC	Research	others	Total
I	12	4	4	-	1		21
II	9	3	4	-	5		21
III	10	5	4	2	2		23
IV	10	5	4	-	6	2	29
Total	41	17	16	2	14	2	92

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**DEPARTMENT OF
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**M.Phil
SYLLABUS**

(REGULATION 2019)



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DEPARTMENT OF MATHEMATICS

M.Phil., COURSE STRUCTURE

SEMESTER - I						
COURSE CODE	COURSE TITLE	L	T	P	C	
193___11 (Common Paper)	Research Methodology	2	2	0	2	
193MAC12	Algebra and Analysis	2	2	0	2	
193MAC13	Advanced Numerical Analysis	2	2	0	2	
(Common Paper) CPE_RPE	Research and Publication Ethics	2	2	0	2	
	Total	08	08	00	08	
SEMESTER - II						
193MAC31	Project Work				02	

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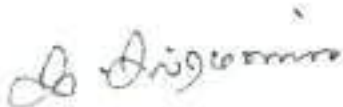
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Dean
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Annexure III

LIST OF MEMBERS -2019-2020

1. Dr.S.Subramanian /Prof & HOD (Chairman , BOS)
2. Dr.K.Saravanan /Dean (EX-Offico,BOS)
3. Dr.S.Udayakumar, Professor of Mathematics, (Member, BOS)
4. Dr.R.Balakumar, Associate Professor of Mathematics, (Member, BOS)
5. Dr.K.Selvaraj, Assistant Professor of Mathematics, (Member, BOS)
6. Dr.R.Abirami, Assistant Professor of Mathematics, (Member, BOS)
7. Dr.S.Ramasubramanian / Prof (External Member, BOS)
8. Dr.B.Chellappa / Prof (External Member, BOS)



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VALUE ADDED COURSES SYLLABUS



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Course Code	Course Title	L	T	P	C
19512IRF	INTRODUCTION TO RINGS AND FIELDS	4	0	0	2
Aim	To introduce INTRODUCTION TO RINGS AND FIELDS to the students				
Objectives	<ul style="list-style-type: none"> • To introduce the problems solving technique for rings and fields • To enable students prepare themselves for various competitive exams 				
UNIT-1	Definitions of rings, examples, polynomial rings, homeomorphism				
UNIT-2	Ideals prime and maximal ideals, quotient rings, Notherian rings, Hilbert basis theorem				
UNIT-3	Integral Domains, Quotient fields, Unique factorization domains, principal ideal domains				
UNIT-4	Definition of fields, examples, degree of field extensions				
UNIT-5	Adjoint roots, Primitive element theorem, finite fields.				
Reference	Algebra by Michael Artin				

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Course Code	Course Title	L	T	P	C
19512QAR	Quantitative Aptitude and Reasoning	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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Thanjavur, Tamilnadu, India.

(For the candidates admitted from the academic year 2017 onwards)

Regulation 2017

VALUE ADDED COURSE

Course Code	Course Title	L	T	P	C
17VADMAP	MAPLE	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	Contents
I	Simple Programs using Mathematical constant, Programs using complex functions.
II	Numerical solutions of nonlinear equations and systems, Solving system of linear equations using Jacobi method
III	Program using Trigonometric and Hyperbolic Expressions , Finding Eigen values and Eigen vectors
IV	Plotting Points in the Plane and Space , Analyse data using Central Tendency and Measures of dispersion and distributions
V	Find the Laplace integral transforms for different functions. , Obtain the solution of the initial value problem

Text Book Maple and Mathematica, A Problem Solving Approach for Mathematics Second Edition, Dr. Inna Shingareva & Dr. Carlos Lizárraga-Celaya, Springer Wien New York

Outcomes : To learn a new programming language, beginner in the field of data science.
To kindle the problem solving ability of the students in statistics.

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Regulation 2017 VALUE ADDED COURSE

Course Code	Course Title	L	T	P	C
17VACRP	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. Marvi, 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
19512MCE	Mathematics for competitive 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.

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Course Code	Course Title	L	T	P	C
19VACSM	SAGEMATH	4	0	0	2
Objectives	PREREQUISITES : Basic knowledge of Calculus, Linear Algebra and ODE and Numerical Methods. INDUSTRIES SUPPORT : Any industry dealing with Data Science and Numerical Computations.				
Unit-1	Installation of Python 1. Getting Started with Python 2. Python as an advanced Calculator 3. Lists in Python 4. Tuples sets and dictionary in Python 5. Functions and Branching 6. For loop in Python 7. While loop in Python				
Unit-2	Week 2: 8. Creating Modules and Introduction to NumPy 9. Use of NumPy module 10. Python Graphics using Matplotlib 11. Use of SciPy and SymPy in Python 12. Classes in Python 13. Classes in Python				
Unit-3	Week 3: 00. Introduction and Installation of SageMath 14. Exploring integers in SageMath 15. Solving Equations in SageMath 16. 2d Plotting with SageMath 17. 3d Plotting with SageMath 18. Calculus of one variable with SageMath Part 1 19. Calculus of one variable with SageMath Part 2				
Unit-4	Week 4: 20. Applications of derivatives 21. Integrals in SageMath 22. Applications of Integrals 23. Partial Derivatives and gradients, jacobians 25. Local maximum-minimum 26. Application of local maximum and minimum 27 Applications to least square problems				
Unit-5	Week 5: 28. Lagrange Multipliers 29. Working with vectors in SageMath 30. RREF and Solving system of linear Equations 31. Vector Spaces in SageMath 32. Vector Spaces in SageMath (cont..)				

Dr. Jigneesha

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	<p>33. Linear Transformations with SageMath</p> <p>34. Linear Transformations with SageMath (cont..)</p>
Reference	<ol style="list-style-type: none"> 1. www.sagemath.org 2. Mathematical Computation with Sage by Paul Zimmermann available from on http://www.sagemath.org 3. A First Course in Linear Algebra by Robert Beezer available online http://linear.ups.edu/ 4. Abstract Algebra: Theory and Applications by Tom Judson and Robert Beezer (http://abstract.ups.edu/) 5. An Introduction to SAGE Programming: With Applications to SAGE Interacts for Numerical Methods by Razvan A Mezei, Springer

Ch. Srinivasan

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NEW COURSES SYLLABUS



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Core II- BASIC MATHEMATICS -II TRIGONOMETRY, ANALYTICAL GEOMETRY (3D) AND INTEGRAL CALCULUS

Course code	Course Title	L	T	P	C
19112AEC14	Core - II Basic Mathematics -II (Trigonometry, Analytical Geometry 3 D and Calculus)	4	0	0	4

Objectives:

This course is designed here to get sufficient ideas about integral calculus, trigonometry and analytical geometry to tackle the mathematics needed in other sciences.

UNIT I:

Expansions of $\cos n\theta$, $\sin n\theta$, $\cos^2\theta$, $\sin^2\theta$ (for positive integral values of n) — series for $\cos \theta$, $\sin \theta$, $\tan \theta$.

UNIT II:

Hyperbolic functions — Principal and general values of logarithms of complex numbers. Separation of real and imaginary parts — factorization.

UNIT III:

Summation of trigonometric series — method of difference - sum of series of n angles in A.P, C+ is form, Gregory's series.

UNIT IV:

Analytical Geometry (3-D)
Spheres (Simple Properties only) general second degree equations to cone cylinder.

UNIT V:

Integral calculus.
Evaluation of double and Triple integral — Beta and gamma integrals.

References

1. Trigonometry — T.K.M. Pillai
2. Analytical Geometry (3D) And Integral Calculus — T.K.M. Pillai

Learning outcomes

By the end of this course, you should:

- ✓ be able to manipulate the expansions of basic trigonometric functions
- ✓ be able to calculate summation of trigonometric series and Gregory's series
- ✓ understand the concept of analytical geometry and be able to use properties of spheres, cone and cylinder in real cases.
- ✓ be able to manipulate, and solve problems using, integral calculus

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ALLIED -II PRACTICAL MATHEMATICAL STATISTICS

Course code	Course Title	L	T	P	C
1911BAEC47L	Allied -II - Practical - Mathematical Statistics	0	0	2	2

Objectives:

Statistics provides the methodology for the planning and execution for any scientific enquiry, which has been accepted as a valid tool in this content. In this course random variables, discrete distributions, continuous distributions, chi-square distribution and sampling distributions would be taught.

List of Practical's

1. Measures of Central tendencies and measures of dispersion.
2. Moments, Skewness and Kurtosis.
3. Fitting of binomial distribution.
4. Fitting of Poisson distribution.
5. Fitting of Normal distribution.
6. Correlation.
7. Regression.
8. Goodness of fit.
9. Attributes, Contingency table.
10. Large sample tests.
11. t — tests.
12. Variance tests.
13. ANOVA.
14. Design of Experiments.

Learning outcomes

By the end of this course, you should:

- Students learned statistical techniques and statistical data
- Understand the concept of various distributions
- A knowledge of test of significance based on parametric and non – parametric test

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ALLIED -II PRACTICAL MATHEMATICAL STATISTICS

Course code	Course Title	L	T	P	C
1911EAEC47L	Allied -II - Practical - Mathematical Statistics	0	0	2	2

Objectives:

Statistics provides the methodology for the planning and execution for any scientific enquiry, which has been accepted as a valid tool in this context. In this course random variables, discrete distributions, continuous distributions, chi-square distribution and sampling distributions would be taught.

List of Practical's

1. Measures of Central tendencies and measures of dispersion.
2. Moments, Skewness and Kurtosis.
3. Fitting of binomial distribution.
4. Fitting of Poisson distribution.
5. Fitting of Normal distribution.
6. Correlation.
7. Regression.
8. Goodness of fit.
9. Attributes, Contingency table.
10. Large sample tests.
11. t — tests.
12. Variance tests.
13. ANOVA.
14. Design of Experiments.

Learning outcomes

By the end of this course, you should:

- Students learned statistical techniques and statistical data
- Understand the concept of various distributions
- A knowledge of test of significance based on parametric and non – parametric test

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Elective II - GRAPH THEORY

Course code	Course Title	L	T	P	C
19112DSC65A	Elective Paper -II Graph Theory	5	0	0	4

Objectives:

Graph Theory is an integral part of Discrete Mathematics. It has applications to many fields, including computer science, physics, chemistry, psychology and sociology. In this course we teach basic topics in graph theory such as Trees, Directed graphs, Connectivity, Euler tours, Hamilton cycles, Matchings, Colourings, Planar graphs

UNIT 1: Definitions of graph — finite and infinite graphs — incidence and degree isolated and pendent vertices — isomorphism — sub graphs — walks, paths and circuits — Connected and disconnected graphs — components — Euler graphs — Operations on graphs — more on Euler graphs — Hamiltonian paths and circuits.

UNIT 2: Trees — Properties of trees — pendent vertices in a tree — distances and centers in a tree — Rooted and binary trees — Spanning trees — fundamental Circuits — Finding all spanning trees of a graph — Spanning trees in a weighted graph.

UNIT 3: Cut-sets — Properties of cut-set- All cut-sets in a graph — Fundamental circuits and cut-sets — connectivity and reparability.

UNIT 4: Planar graphs — Kuratowski's two graphs — Representation of a planar graph — Detection of planarity — Geometrical dual — Combinational dual.

UNIT 5: Matrix representation of graphs — Incidence Matrix — circuit matrix Fundamental circuit and matrix and rank of the circuit matrix — cut-set matrix — Adjacency matrix Chromatic number — Chromatic partitioning — Chromatic polynomial.

Treatment and content as in "Graph Theory with applications to engineering and computer science" by Narsing Deo, Prentice Hall of India, New Delhi.

References:

1. Invitation to graph Theory' by Dr.S. Arunugam and Dr. S. Ramachandran.
2. 'Graph Theory' — F. E-Harary, Narosa Publishing House, New Delhi — Madras - Bombay.
3. Graph Theory — S.A. Choudum, Macmillan India Limited —New Delhi — Madras.

Learning outcomes

By the end of this course, you should be able

- Knowledge in Graph Theory
- Understanding the properties of Graph Theory
- Understanding the concept of Kuratowski's graph
- Understanding Matrix representation of graphs

D. Durgadevi

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DEPARTMENT OF BIOCHEMISTRY

MINUTES OF THE BOARD OF STUDIES MEETING - 2019-2020

The meeting of the Board of studies for UG and PG in Biochemistry was held on 07.03.2019 at 10.00 in the staff room under the chairmanship of Dr. Bakrudeen Ali Ahmed, Head of the Department.

The following members were present

1. Dr. Bakrudeen Ali Ahmed / (Chairman, BOS)
2. Dr. L. Chinnappa / Dean (EX-Offico, BOS)
3. Dr. A. Solma Chandra Packiavathi / Professor (Member, BOS)
4. Dr. S. Ambiga / Associate Professor (Member, BOS)
5. Dr. S. Sathishkumar / Assistant Professor (Member, BOS)
6. Dr. M. Vijay / Assistant Professor (Member, BOS)
7. Dr. S. Ganesan / (External Member, BOS), Associate Professor, Zoology and Biotechnology, A.V.V.M. Sri Pushpam College (Autonomous), Thanjavur - 613503
8. Mr. M. Guanavel / (External Member, BOS), Shasun Pharmaceuticals Limited, Puducherry - 605014.

The Chairman of the Board of Studies for UG and PG in Biochemistry welcomed the Members. Members analyzed the feedbacks from the stakeholders and the follow up actions taken. The committee scrutinized the curriculum in detail.

The members of the board unanimously discussed and carefully reviewed the exciting syllabus for (B.Sc., Biochemistry & M.Sc., Biochemistry) and details made the necessary change in upcoming (B.Sc., Biochemistry & M.Sc., Biochemistry) as mentioned below,

**REVIEW OF CURRICULUM & SYLLABUS IN BSc
REGULATION 2019**

Revision of the existing Curriculum based on NAAC guidelines

It is decided to revise the syllabus of B.Sc. & MSc. Biochemistry program by incorporating the following aspects.

1. Specific mentioning should be made in the curriculum with regards to:

- Program outcomes
- Program specific outcomes
- Course objectives
- Course outcomes (Annexure 1)

2. Develop curricula with relevance to

- Local needs
- Regional needs
- National needs
- Global needs

3. Develop existing course with focus on:

- Employability
- Entrepreneurship
- Skill development (Annexure 2)

4. Develop existing course with focus on:

- Gender
- Environment and sustainability
- Human values and professional ethics (Annexure 3)

5. Introduce field trip, research projects and internships at the end of each academic year

6. Research collaborations with research institutes to facilitate the course and signing of MOU's with them

Members started reviewing the syllabus of each course extensively. The following changes were proposed.

The meeting adopts the following resolutions:

- Define and include Program outcomes/ course objectives and course outcomes in the syllabus
- Divide or restructure the syllabus for an hour or a suitable time frame
- Enrich the syllabus with relevant topics and avoiding repetitions
- BOS has approved the induction of Anurajkumar as the alumni representative

To consider and approve the curriculum and syllabus for UG and PG biochemistry

The chairman informed the house that the department teams have been working on the revision of curricula and in this direction one seminar was conducted on Dec 2019 wherein experts from industry and academia were invited to discuss the proposed curricula.

The members considered the revised curricula and discussed different issues. It was pointed out that number of Credits for each subject should be added in the detailed syllabus of every subject (Annexure 4)

The members approved the curricula for consideration of faculty of Biochemistry. The matter regarding the implementation of a scheme from academic year 2019-2020 was also discussed and it was decided that the new scheme can be implemented from BSc II-VI semester and MSC II-IV semester with effect from the Academic year 2019 by taking into consideration stakeholder feedback on curricula.

The Committee emphasized the need for contemporary topics which can enhance the Biochemical skills of students and insisted that the topics should connect with the students.

The Committee suggested and incorporated the following changes

- "Biomolecules/17115AEC13" has to be retained as it is without any changes, but the new course code "19115AEC13" is implemented
- "Biomolecules Lab-I/17115AEC14L" has to be retained as it is without any changes, but the new course code "19115AEC14L" is implemented.
- The following changes have been recommended by the committee with regard to Biochemistry (BSc I year II semester)
 1. "Analytical Techniques/17115AEC23" syllabus content is modified and the title is changed to "Bioanalytical techniques/19115AEC23".
 2. Separation techniques – Solvent extraction – principles and applications of Soxhlet extraction and supercritical fluid extraction; Distillation – Theory of distillation, method and application of fractional and steam distillation; Techniques of sublimation and its applications have been removed from Unit I.
 3. Colorimetry: Beer Lambert's Law, Light absorption and its transmittance, Absorption Spectroscopy - Principle, instrumentation and applications of colorimetry and UV-Vis spectrophotometer. Emission Spectroscopy – Spectrofluorometer - Principle, instrumentation and applications. Flame photometry - principle and applications, new topics have been introduced in Unit I
- The following changes have been recommended by the committee with regard to Biochemistry (BSc II year III semester)
 1. "Cell Biology and Genetics / 17115AEC33" Syllabus content is modified and new course code "19115AEC33" is implemented.
 2. "The cell – functional organization of cell – eukaryotic and prokaryotic organization – virus – fungal cell – viroid – Prions – cell surface – cell wall – plasma membrane – cell recognition - cell adhesion – cell aggregation – cell differentiation" have been removed from Unit I
 3. "An Overview of cells: Origin and Evolution of cells. Cell theory, Classification of cells – Prokaryotic and Eukaryotic cells. Comparison of prokaryotic and eukaryotic cells. Cell Membrane – Fluid mosaic model of membrane structure and its composition. Cell cycle", have been added.

- The following changes have been recommended by the committee with regard to Biochemistry (BSc II year III semester)
 1. The course name and code "Biochemical Techniques Lab-I/17115AEC34L" have been change into "Cell Biology and Genetics Lab-I/19115AEC34L".
 2. New experiment have been include "Lipid Solubility of Membranes"

- The following changes have been recommended by the committee with regard to Biochemistry (BSc II year III semester)
 1. The course code "Research Methodology /17115RMC37" have been change into "19115RMC37"
 2. "Basic Principles of Laboratory Safety and Waste management -Introduction - Access to Laboratory and Emergency Exits - Personal Protective Clothing and Equipment - Good Working Practices-Maintenance of Laboratory Equipment - Working with Hazardous Substances - Storage of Chemicals - Working with Flammable Solvents - Gas Cylinders- Fire Precautions - Emergency Procedures - First Aid - Accident Follow-Up - Safety Manual - Safety Training - Management of Laboratory Safety and Responsibilities - Waste Management" have been removed from Unit V.
 3. "Basic Principles of Laboratory Life Sciences Laboratory-Introduction - Access to Laboratory and Emergency Exits - Basic Biostatistics, Mean, Median, Mode and its Application - Fundamental of Biosafety, Bioethics, Replication - Advantages and Disadvantages, Standard division, Standard Error, Preparation of Chemicals - Percentage, Molarity and Normality, Ratio Solution, PPM Solution etc. Ethical Issues in Animal Handling, Basic of DMRT, and ANOVA g_{cc} " have been added into Unit V.

- The following changes have been recommended by the committee with regard to Biochemistry (BSc II year IV semester)
 1. The course code "Human Physiology /17115AEC43" have been changed into "19115AEC43"
 2. General organization of nervous system, Neuron, types, conduction of nerve impulses (Non-myelinated and myelinated fibers) Synaptic transmission, neuromuscular junction, Neurotransmitters in synaptic transmission. Structure of human brain, cerebrum, cerebellum, Hypothalamus and spinal cord - composition & functions of CSF have been removed from Unit IV.

3. Central nervous system- General organization. Functional units. Resting and action potential- conduction of nerve impulse. Synaptic transmission. Brain Chemical composition, metabolism, metabolic adaptation, neurotransmitters and cAMP. Biochemical aspects of learning and memory. ~~Enkephalins~~ and endorphins have been added in Unit IV.
- The following changes have been recommended by the committee with regard to Biochemistry (BSc II year IV semester)
 1. "Biochemical Techniques Lab-II /17115AEC44L" has to be retained as it is without any changes, but new course code "19115AEC44L" is implemented
 - The following changes have been recommended by the committee with regard to Biochemistry (BSc III year V semester)
 1. The course code "Enzymes /17115AEC51" have been changed into "19115AEC51"
 2. Non-protein, enzyme-ribozymes and aptozymes have been added into unit I
 - The following changes have been recommended by the committee with regard to Biochemistry (BSc III year V semester)
 1. The title of the course and code "Metabolism/17115AEC52" have been changed into Bioenergetics and Metabolism/19115AEC52.
 2. In Unit II "Carbohydrate metabolism" title has been added, One new topic have been added "Glucuronic acid cycle"
 3. In Unit III "Lipid metabolism" title has been added.
 4. In Unit IV "Protein, nucleic acid and porphyrin metabolism" titles have been added, one new topic has been included "Biosynthesis and degradation porphyrin and Heme".
 5. In Unit III "Biological oxidation" title has been added.
 - The following changes have been recommended by the committee with regard to Biochemistry (BSc III year V semester)
 1. The course code "Immunology /17115AEC53" have been changed into 19115AEC53
 2. In Unit V "Immunity to infection" topic has been added
 - The following changes have been recommended by the committee with regard to Biochemistry (BSc III year V semester)
 1. Food analysis lab and enzyme analysis lab have been merged to "Food and enzyme analysis lab". course code "17115AEC54L" have been change into "19115AEC54L"
 2. Two experiments have been removed "Estimation of Carbohydrate by ~~antrone~~ method and Estimation of protein by Lowry's method"

- The following changes have been recommended by the committee with regard to Biochemistry (BSc III year V semester)

1. Discipline specific elective course "Pharmaceutical chemistry/17115DSC56A" have been changed into "Pharmaceutical Biochemistry/19115DSC56A"
2. "Toxicity assessment- acute, subchronic, chronic exposure, determination of ED₅₀ and LD₅₀ values" was incorporated into unit IV.

As per new syllabus some important subject as per industrial need are omitted from syllabus eg Immunotechnology/17115DSC65B, Urine Analysis Lab/17115SEC64L, Blood Analysis Lab/17115AEC63L, Enzyme technology/17115DSC56B.

List of Course has to be newly added

1. Hematology and Clinical Biochemistry Lab
2. Molecular Biology Lab
3. Immunology Lab
4. Hematology and Clinical Biochemistry Lab
5. Molecular Biology Lab

Discipline specific elective course:

1. Basic Biotechnology
2. Hospital Managements

Of the above list of course syllabus has to be framed. (Annexure 5)

- The list of introduction of open electives offered in other departments are approved (Annexure 5)
- The list of introduction of value added course offered for the students are approved (Annexure 6)

- o Diploma course on Clinical Nutrition & Dietetics (90 hours)

- o Certificate course on Vermiculture (45 hours)

Suggestions to improve the syllabus:

- At least two foreign author books should be included in the reference book sections.
- Latest edition of the books should be taken as text books as well as reference books.
- Outcomes of each course to be presented in standard format.

Review of Department activities

- Resolution: all the BOS members approved the student's activities conducted during 2019-2020.
- Suggestion:
- Committee members appreciated all the departmental activities including an internship program for student and encourage for continuing the same

To consider and approve the format of examination for theory and practical exam to be held in Dec 2019

The members deliberated and approved the format of examination for theory exam of BSC and BSC should be prepared by an internal and external examiner jointly. It was pointed out that without the permission of the Chairman of BOS, the CTE should not modify the name of the internal or external examiner.

The members authorized the Chairman of BOS to submit for the year of examination for practical theory exam to be held in Dec 2019.

To consider and approve the format of examination for theory and practical examination to be held in

The members deliberated and approved the format of examination for practical exam 2019-2020 for theory and practical exam of BSC and BSC courses. It was decided that in the future, the members authorized the Chairman of BOS to change the examination as per need.

To consider the identification of various research groups and developing their corresponding research lab

The members of the committee deliberated and approved the quality of students at graduate and post graduate level research lab, the department needs to form research groups consisting of students and each group will take the necessary steps to set up the research facilities required for the group in the form of Lab. In this regard, a committee consisting of Dr. Babubhai H. Kulkarni (Chairman), Dr. J. Chougale was constituted to identify the research groups.

REVIEW OF CURRICULUM & SYLLABUS in M.Sc. Biochemistry

The following changes have been made in opening years with respect to the existing curriculum.

The Committee approved and incorporated the following changes

SEMESTER I

- "Simultaneous IT/SSPECT" has to be retained as it is without any change, but the new course code "BCSSPECT" is implemented.
- "Biochemical and Instrumental analysis: IT/SSPECT" has to be retained as it is without any change, but the new course code "BCSSPECT" is implemented.
- "Enzymology: IT/SSPECT" has to be retained as it is without any change, but the new course code "BCSSPECT" is implemented.
- "Biochemical Techniques Lab - I IT/SSPECT4" has to be retained as it is without any change, but new course code "BCSSPECT4" is implemented.

- Discipline specific elective paper "Biostatistics /17115DSC15A and Immunology/17215DSC15B" have to be retained as it is without any changes, but the new course code "19215DSC15A/19215DSC15B" is implemented respectively.

SEMESTER II:

- "Cellular Biochemistry /17215SEC21", "Metabolism and Regulation/17215SEC22" "Enzymology Lab- II /17215SEC24L" has to be retained as it is without any changes, but the new course code "19215SEC21, 19215SEC22, 19215SEC24L" is implemented respectively.
- As per the new syllabus, important subjects as per industrial need "Neuro Biochemistry/19215SEC23" has been included.(Annexure 7)
- They suggested the "Bioinformatics/17215SEC22" core course to move into the discipline specific elective course, the code has been changed into "19215DSC25C – Bioinformatics"
- Discipline specific elective paper "Endocrinology /17115DSC25A and Clinical nutrition and dietetics /17215DSC25B" have to be retained as it is without any changes, but the new course code "19215DSC25A/19215DSC25B" has been implemented respectively.

SEMESTER III:

- "Molecular Biology /17215SEC31", "Clinical Biochemistry /17215SEC32" "Clinical Biochemistry Lab /17215SEC33L" has to be retained as it is without any changes, but the new course code "19215SEC31, 19215SEC32, 19215SEC33L" is implemented respectively.
- As per new syllabus, important subject as per industrial need "Plant Biochemistry/19215SEC33" has been included
- Discipline specific elective paper "Genetics and Genetic Engineering /17215DSC34A and Pharmaceutical Biotechnology /17215DSC34B" have to be retained as it is without any changes, but the new course code "19215DSC34A/19215DSC34B" is implemented respectively

SEMESTER IV:

- The list of introduction of open electives "Herbal medicine/19215OEC" offered in other departments are approved. (Annexure 7)

- As per new syllabus, important subjects as per industrial need "Molecular basis of diseases/19215SEC41, Environmental Biochemistry/19215SEC42, Molecular and Environmental biochemistry Lab/19215SEC43L" has been included. (Annexure 7)
- They suggested adding new discipline specific elective course "Medical Biotechnology 19215DSC44A, Applied Microbial Biochemistry/19215DSC44B" (Annexure 7)

REVIEW OF CURRICULUM & SYLLABUS in MPhil Biochemistry

The following changes have been made in upcoming years with respect to the existing curriculum.

The Committee suggested and incorporated the following changes

SEMESTER I:

- "Biomolecules /17215SEC11" has to be retained as it is without any changes, but the new course code "19215SEC11" is implemented
- "Biochemical and Instrumental analysis /17215SEC12" has to be retained as it is without any changes, but the new course code "19215SEC12" is implemented.
- "Enzymology /17215SEC13" has to be retained as it is without any changes, but the new course code "19215SEC13" is implemented
- "Biochemical Techniques Lab - I /17215SEC14L" has to be retained as it is without any changes, but new course code "19215SEC14L" is implemented
- Discipline specific elective paper "Biostatistics /17215DSC15A and Immunology /17215DSC15B" have to be retained as it is without any changes, but the new course code "19215DSC15A/19215DSC15B" is implemented respectively.

SEMESTER II:

- "Cellular Biochemistry /17215SEC21", "Metabolism and Regulation /17215SEC22" "Enzymology Lab- II /17215SEC24L" has to be retained as it is without any changes, but the new course code "19215SEC21, 19215SEC22, 19215SEC24L" is implemented respectively.
- As per the new syllabus, important subjects as per industrial need "Neuro Biochemistry/19215SEC23" has been included. (Annexure 7)
- They suggested the "Bioinformatics/17215SEC22" core course to move into the discipline specific elective course, the code has been changed into "19215DSC23C - Bioinformatics"

- Discipline specific elective paper "Endocrinology /17215DSC25A and Clinical nutrition and dietetics /17215DSC25B" have to be retained as it is without any changes, but the new course code "19215DSC25A/19215DSC25B" has been implemented respectively.

SEMESTER III:

- "Molecular Biology /17215SEC31", "Clinical Biochemistry /17215SEC32" "Clinical Biochemistry Lab /17215SEC33L" has to be retained as it is without any changes, but the new course code "19215SEC31, 19215SEC32, 19215SEC33L" is implemented respectively.
- As per new syllabus, important subject as per industrial need "Plant Biochemistry/19215SEC33" has been included
- Discipline specific elective paper "Genetics and Genetic Engineering /17215DSC34A and Pharmaceutical Biotechnology /17215DSC34B" have to be retained as it is without any changes, but the new course code "19215DSC34A/19215DSC34B" is implemented respectively

SEMESTER IV:

- The list of introduction of open electives "Herbal medicine/19215OEC" offered in other departments are approved (Annexure 7)
- As per new syllabus, important subjects as per industrial need "Molecular basis of diseases/19215SEC41, Environmental Biochemistry/19215SEC42, Molecular and Environmental biochemistry Lab/19215SEC43L" has been included. (Annexure 7)
- They suggested adding new discipline specific elective course "Medical Biotechnology /19215DSC44A, Applied Microbial Biochemistry/19215DSC44B" (Annexure 7)

Members of the Board updated the panel of examiners and submitted the same to the Academic Counsel for its approval.

Annexure 1	-	course outcome	
Annexure 2	-	Employability	
Annexure 3	-	human value	
Annexure 4	-	Revised Curriculum structure Credits	
Annexure 5	-	Revised Curriculum structure and Syllabus of UG.	
Annexure 6	-	Revised curriculum structure and syllabus of Add on course	Annexure 7
	-	Revised Curriculum structure and Syllabus of PG.	
Annexure 8	-	List of Members.	

Signature of the Chairperson and Members

1. Dr. Bakrudeen Ali Ahmed (Chairman, BOS)



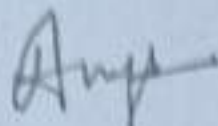
2. Dr. L. Chinappa / Dean (EX-Office, BOS)



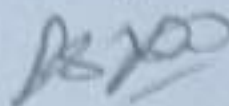
3. Dr. A. Sobha Chandra Packiyathi / Professor (Member, BOS)



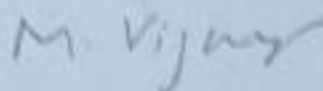
4. Dr. S. Ambiga / Associate Professor (Member, BOS)



5. Dr. S. Sathishkumar / Assistant Professor (Member, BOS)



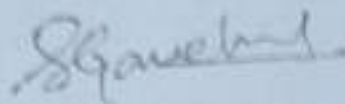
6. Dr. M. Vijay / Assistant Professor (Member, BOS)



External Members

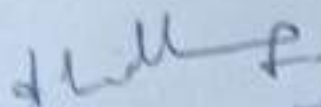
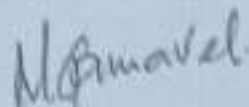
7. Dr. S. Ganesan (External Member, BOS)

Associate Professor,
Zoology and Biotechnology,
A.V.V.M. Sri Pushpam College
(Autonomous),
Thanjavur - 613503

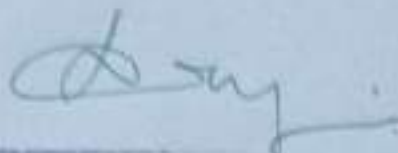


8. Mr. M. Guanavel, (External Member, BOS)

Shasun Pharmaceuticals Limited,
Puducherry - 605014.



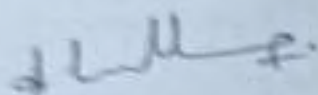
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Department of Biochemistry
School of Arts & Science
PRIST Deemed to be University,
Thanjavur-613 403



Dean of Arts & Science
PRIST Deemed to be University
Thanjavur - 613 403, Thanjavur.

List of Members - 2019-20

1. Dr. A. Bakrudeen Ali Ahmed
2. Dr. A. Sobna Chandra Packiavathy
3. Dr. A. Sobna Chandra Packiavathi
4. Dr. S. Ambiga
5. Dr. S. Sathishkumar
6. Dr. M. Vijay
7. Dr. N. Geetha
8. Mr. Subvadi Easwaran



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**B. Sc., Biochemistry Syllabus
Regulation - 2019
COURSE STRUCTURE**

Course Code	Course Title	L	T	P	C
SEMESTER I					
19110AEC11/ 19111AEC11/ 19132AEC11/ 19135AEC11	Language-I (Tamil-I/ Advanced English-I/ Hindi-I/ French-I)	4	0	0	2
19111AEC12	English-I	4	0	0	2
19115AEC13	Biomolecules	6	1	0	5
19115AEC14L	Biomolecules Lab-I	0	0	3	2
19114AEC15	Chemistry -I	5	1	0	4
19114AEC16L	Volumetric Analysis Lab	0	0	3	2
191 SEC01	Skill Based Elective-I	0	0	2	1
19111SEC01L	Communicative English Lab-I	0	0	1	1
191INDCONS	Indian Constitution	-	-	-	-
	Total	20	1	9	19
SEMESTER II					
19110AEC21/ 19111AEC21/ 19132AEC21/ 19135AEC21	Language-II (Tamil-II/ Advanced English-II / Hindi-II/ French-II)	4	0	0	2
19111AEC22	English-II	4	0	0	2
19115AEC23	Biochemical Techniques	6	1	0	5
19115AEC24L	Biochemical Techniques Lab-I	0	0	3	2
19114AEC25	Chemistry - II	5	1	0	4
19114AEC26L	Organic Analysis Lab	0	0	3	2
19115RLC27	Research LED Seminar	-	-	-	1
191 SEC02	Skill Based Elective -II	0	0	2	1
19111SEC02L	Communicative English Lab-II	0	0	1	1
	Total	19	2	9	23
SEMESTER III					
19110AEC31/ 19111AEC31/ 19132AEC31/ 19135AEC31	Language-III (Tamil-III/ Advanced English-III / Hindi-III/ French-III)	4	0	0	2
19111AEC32	English-III	4	0	0	2
19115AEC33	Cell Biology and Genetics	5	0	0	4
19115AEC34L	Cell Biology and Genetics Lab	0	0	3	2
19120AEC35	Programming in C	5	1	0	5
19120AEC36L	Programming in C Lab	0	0	3	2
19115RMC37	Research Methodology	2	0	0	2

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191 SEC03	Skill based Elective- III	0	0	2	1
19111SEC03L	Communicative English Lab-III	0	0	1	1
	Total	20	1	9	21
	SEMESTER IV				
19110AEC41/ 19111AEC41/ 19132AEC41/ 19135AEC41	Language-IV (Tamil-IV/ Advanced English-IV/ Hindi-IV/ French-IV)	4	0	0	2
19111AEC42	English-IV	4	0	0	2
19115AEC43	Human Physiology	5	0	0	4
19115AEC44L	Biochemical Techniques Lab-II	0	0	3	2
19120AEC45	Fundamentals of Computing	6	0	0	5
19115AEC46L	Web Design Lab	0	0	3	2
191 SEC04	Skill based Elective- IV	0	0	2	1
19111SEC04L	Communicative English Lab-IV	0	0	1	1
191ENVTSTU	Environmental Studies	2	0	0	2
	Total	21	0	9	21
	SEMESTER V				
19115AEC51	Enzymes	5	0	0	4
19115AEC52	Bioenergetics and Metabolism	5	0	0	3
19115AEC53	Immunology	4	1	0	4
19115AEC54L	Food and enzyme Analysis Lab	0	0	3	2
19115AEC55L	Immunology Lab	0	0	3	2
19116DSC56	Discipline Specific Elective -I	5	0	0	3
19115BRC57	Participation in bounded research	-	-	-	1
191 SEC05	Skill based Elective- V	0	0	2	1
19111SEC05L	Communicative English Lab-V	0	0	1	1
	Total	19	1	9	21
	SEMESTER VI				
19115AEC61	Clinical Biochemistry	5	0	0	4
19115AEC62	Molecular Biology	5	0	0	5
19115AEC63L	Hematology and clinical biochemistry Lab	5	0	3	2
19115SEC64L	Molecular Biology Lab	0	0	3	2
19115DSC65	Discipline Specific Elective -II	5	0	0	3
191-OEC	Open Elective Course	4	0	0	2
19115PRW67	Project Work	-	-	-	4
191-SEC06	Skill based Elective - VI	0	0	2	1
19111SEC06L	Communicative English lab - VI	0	0	1	1
19115EXACT	Extension Activities	-	-	-	-
19115PEE	Programme Exit Examination	-	-	-	2
	Total	19	0	9	25
	Total Credits for the Programme				127

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In-charge of the Department
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Discipline Specific Electives

Semester	Discipline Specific Elective Courses-I
V	a) 19115DSC56A - Pharmaceutical Biochemistry b) 19115DSC56B - Basic Biotechnology
	Discipline Specific Elective Courses-I
VI	a) 19115DSC65A- Biochemistry of plants and microbes b) 19115DSC65B - Hospital Managements

Open Electives

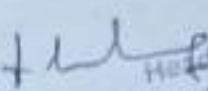
Semester	Open Elective Courses
VI	a) 19110OEC-Tamil Ilakkiya Varalaru b) 19111OEC-Journalism c) 19112OEC-Development of Mathematical Skills d) 19113OEC-Instrumentation e) 19114OEC-Food and Adulteration f) 19120OEC - E-Learning g) 19122OEC - Web Technology h) 19161OEC - Banking service

Skill based Electives

Semester	Skill based Elective Courses
I	a) 19120SEC01AL-Package Lab - I b) 19160SEC01B-Soft skill - I
II	a) 19120SEC02AL-Package Lab - II b) 19160SEC02B-Soft skill - II
III	a) 19120SEC03AL-Package Lab -III b) 19160SEC03B-Soft skill - III
IV	a) 19120SEC04AL-Package Lab -IV b) 19160SEC04B- Soft skill - IV
V	a) 19120SEC05AL-Package Lab -V b) 19160SEC05B-Soft skill - V
VI	a) 19120SEC06AL-Package Lab -VI b) 19160SEC06B-Soft skill - VI

Credit Distribution

Sem	AEC	SEC	DSC	OEC	Research	Others	Total
I	17	2	-	-	-	-	19
II	17	2	-	-	1	-	20
III	17	2	-	-	2	-	21
IV	17	2	-	-	-	2	21
V	15	2	3	-	1	-	21
VI	11	4	3	2	4	1	25
Total	94	14	6	2	8	3	127


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SCHOOL OF ARTS AND SCIENCE
M. Sc BIOCHEMISTRY -SYLLABUS - REGULATION 2019
COURSE STRUCTURE

Course Code	Course Title	L	T	P	C
SEMESTER I					
19215SEC11	Biomolecules	6	1	0	5
19215SEC12	Biochemical and Instrumental analysis	6	1	0	5
19215SEC13	Enzymology	6	1	0	4
19215SEC14L	Biochemical Techniques Lab - I	0	0	4	2
19215DSC15	Discipline specific elective	5	0	0	4
19215RLC16	Research Led Seminar	-	-	-	1
	Total	23	3	4	21
SEMESTER II					
19215SEC21	Cellular Biochemistry	5	1	0	5
19215SEC22	Metabolism and Regulation	5	1	0	5
19215SEC23	Neuro Biochemistry	5	0	0	4
19215SEC24L	Enzymology Lab- II	0	0	4	2
19215DSC25	Discipline Specific Elective -II	5	0	0	4
19215RMC26	Research Methodology	3	0	0	2
19215BRC27	Participation in Bounded Research	-	-	-	2
	Total	23	2	4	24
SEMESTER III					
19215SEC31	Molecular Biology	6	1	0	6
19215SEC32	Clinical Biochemistry	6	1	0	6
19215SEC33	Plant Biochemistry				
19215SEC34L	Clinical Biochemistry Lab	0	0	5	3
19215DSC34	Discipline Specific Elective -III	5	0	0	4
192_OEC-	Open Elective	4	0	0	3
19215SRC35	Design/Socio technical research	-	-	-	2
	Total	21	2	5	24
SEMESTER IV					
19215SEC41	Molecular Basis of diseases	6	1	0	6
19215SEC42	Environmental Biochemistry	6	1	0	6
19215SEC43L	Molecular and Environmental biochemistry lab	0	0	5	3
19215DSC44	Discipline Specific elective -IV	5	0	0	4
19215PRW45	Project Work	-	-	-	6
19215PEE	Programme Exit Examination	-	-	-	2
	Total	17	2	5	27
	Total Credits for the Programme				96

[Signature]
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Discipline specific Electives

Semester	Discipline specific Elective Courses-I
I	a)19215DSC15A - Biostatistics b) 19215DSC15B - Immunology
	Discipline specific Elective Courses-II
II	a)1915DSC25A - Endocrinology b)19215 DSC25B - Clinical nutrition and dietetics c) 19215 DSC25C - Bioinformatics
	Discipline specific Elective Courses-III
III	a)19215DSC34A- Genetics and Genetic Engineering b)19215DSC34B- Pharmaceutical Biotechnology
VI	a) 19215DSC44A - Medical Biotechnology b) 19215DSC44B - Applied Microbial Biochemistry

Open Electives

Semester	Open Elective Courses
III	a) 19211OEC - Writing for the media b) 19212OEC - Applicable Mathematics Techniques c) 19213OEC - Bio-Medical Instrumentation d) 19214OEC - Green Chemistry e) 19220OEC - M-Marketing f) 19261OEC- Insurance Services g) 19280OEC - Counselling Psychology h) 19215OEC - Herbal Medicine i) 19261OEC - Financial Service

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

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NEW COURSES

Immunology Lab

Aim:

The study of the immunological techniques

Course Objective:

Upon successful completion students will -

- To promote critical thinking among students;
- To provide students with a foundation in immunological processes;
- To provide students with knowledge on how the immune system works building on their previous knowledge from biochemistry, genetics, cell biology and microbiology.

Course Outcome

CO1: This course has been designed to provide hands-on experience on the tools and techniques used in immunology.

CO2: The experiments have been designed in such a way that the student will have the opportunity to isolate a specific protein from a natural source, purify it and determine its activity

CO3: Besides, students will get an opportunity to learn diffusion and electrophoresis.

CO4: Basic understanding of Immuno technology

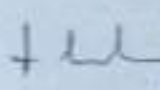
CO5: Study the principle and applications of various immuno techniques ranging from precipitation and agglutination reactions to ELISA, Radio immuno assay

EXPERIMENTS

1. Double Immunodiffusion
2. Single Radial Immuno diffusion
3. Rocket Immunoelectrophoresis
4. Direct ELISA
5. Haemeagglutination tests for identification of human blood groups
6. Detection by viral fever by slide agglutination tests.
7. Dialysis.

REFERENCES:

1. Manuals in Biochemistry – Dr.J.Jayaraman.
2. Practical Biochemistry – Plummer.
3. Manuals in Biochemistry – Dr.S.Ramakrishnan.


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4. Klemir and others: Practical Biological Chemistry.
5. Practical Biochemistry – Koch and Hank Dunn and Drell
6. Practical Biochemistry - Sawhney(2000)
7. Varley's Practical Clinical Biochemistry – Ed. Alan W. Gowenlock (Heinemann Medical Books, London,1988).

HEMATOLOGY AND CLINICAL BIOCHEMISTRY LAB

AIM:

The aim of the paper to study about hematological and clinical biochemical experiments

COURSE OUTCOME

- Explain the origin of blood cells and articulate the process of erythropoiesis and leukopoiesis as it relates to health and disease.
- Discuss the coagulation process and its role in maintaining hemostasis.
- Demonstrate current hematological procedures used to diagnose, monitor and evaluate disorders.
- Demonstrate the basic principles of hematology and clinical biochemistry instrumentation
- Describe and Identify inborn defects in metabolism and correlate them with deficiency of key metabolic markers in the clinical laboratory, their common methods of analysis, and their clinical significance.
- Relate laboratory results to clinical diagnosis and relationship to heart, liver, kidney and pancreas function.

COURSE OBJECTIVE

1. Familiarize students with the specific characteristics of a laboratory of clinical biochemistry.
2. Understanding the serological diseases.
3. Know the analytical methods commonly used in the clinical laboratory.
4. Know how can contribute the clinical laboratory to assess the health status of individuals.

EXPERIMENTS

Hematology Experiment:

- a. To determine total platelet count
- b. To perform PT
- c. To perform APTT
- d. To perform thrombin time
- e. Determination of haemoglobin by various methods.
- f. Determination of Total RBC count.

Clinical Biochemistry experiment:

- Estimation of Glucose by Ortho Toluidine Method
- Estimation of Cholesterol by Zak's Method
- Estimation of Protein by Biuret Method

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- Estimation of Iron by Dipyriddy Method
- Estimation of Urea by DAM Method
- Estimation of Uric Acid by Caraway Method
- Estimation of Calcium by Clark and Collip Method
- Estimation of Bilirubin by Malloy and Evelyn Method

REFERENCES:

- Practical Clinical Biochemistry – Harold Varley,
- Textbook of Clinical Chemistry – Tietz,
- Manuals in Biochemistry – Dr. J. Jayaraman,
- Manuals in Biochemistry – Dr. S. Ramakrishnan,
- Practical Biochemistry – Plummer.

MOLECULAR BIOLOGY LAB

Aim

The aim of the paper to study about molecular experiments

Course Objective: The student

- Can use a broad range of basic and advanced methods in molecular biology
- Can examine, assess, interpret and communicate data acquired from laboratory experiments

Molecular Biology gives in-depth knowledge of biological and/or medicinal processes through the investigation of the underlying molecular mechanisms.

Course Outcome

- Exhibit a knowledge base in genetics, cell and molecular biology.
- Demonstrate the knowledge of common and advanced laboratory practices in cell and molecular biology.
- It can explain the principles of separation of DNA.
- To know the general safety routines for laboratory work in molecular biology.

EXPERIMENTS:

- Estimation of DNA by Diphenylamine method
- Estimation of RNA by Orcinol method
- Isolation of DNA from bacterial, plant and animal cells
- Separation of DNA by Agarose gelelectrophoresis
- Isolation of Plasmid DNA from E.coli
- Estimation of DNA and purity determination by UV absorption method.

REFERENCES:

- Practical Clinical Biochemistry – Harold Varley.

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- Gel Electrophoresis of Nucleic acids, A Practical Approach (1990) by D Rickwood and BD Hames. Oxford Univ. Press. Refer the books already mentioned for other Molecular Biology course.
- Manuals in Biochemistry - Dr.J.Jayaraman.
- Analytical biochemistry and separation techniques lab manual iii edition P.Palanivelu
- Practical Biochemistry - Plummer.

BASIC BIOTECHNOLOGY

AIM:

The aim of the paper to study about basic biotechnology about animal and plant tissue culture, genetic and transformation techniques in animals, plants and its applications in various fields.

Course Objectives:

- It gives introduction to the various transformation techniques employed in animal, plant systems.
- It also describes the application of genetically modified animals, plants in the various fields of science.
- The techniques of animal cell, plant tissue culture and its industrial and medical applications are described.

Course Outcome:

- To understand principles of animal culture, media preparation.
- To explain basic principles of cloning.
- To get insight in applications or recombinant DNA technology in agriculture, production of therapeutic proteins.
- To describe commercial production of fuels, microbial enzymes.
- To explain the microbial degradation of pesticides, Bioremediation & Biofertilizers

Unit I: Fermentation Biotechnology - Biotechnology - scope and importance, Basic principles of microbial growth, Bioreactor- batch and continuous bioreactor, fermentation culture medium, downstream processing. Fermentation production of penicillin and vitamin B12.

Unit II: Food and Industrial Biotechnology - Fermentation production of yoghurt and cheese. Production of single cell protein; spirulina; cultivation and uses. Biofertilizers - blue green algae: cultivation and uses. Production of amylase and protease.

Unit III: Molecular Biotechnology - Basic principles of cloning, Introduction of foreign DNA in to host by particle bombardment gun, electroporation and

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microinjection. Basic Polymerase Chain Reaction (PCR), applications, Micro arrays, the human genome project.

Unit IV: Animal and Plant Biotechnology – Elementary details of Animal cell and tissue culture, medium, transfection, targeted gene transfer, transgenic animals. Plant cell and tissue culture, medium, totipotent, pluripotent cells, protoplast culture, artificial seeds, and transgenic plants.

Unit V: Environmental Biotechnology – Biological fuel generation- ethanol and methane from biomass. Sewage treatment. Bioremediation: oil spill cleanup, bioleaching, IPR, Biosafety and hazards of environmental engineering.

REFERENCE BOOKS;

1. Molecular Biotechnology: Principles and Applications of Recombinant DNA- B.R. Glick & J.J. Pasterak, ASM Press, Washington, D.C., 2010
2. Gene cloning and DNA analysis: an introduction / T.A. Brown.—6th ed. Brown, T.A. (Terence A.) Wiley-Blackwell. 2010.
3. Elements of Biotechnology- P.K.Gupta, Rastogi Publications, 2nd edition 1st reprint, 2015-2016.
4. A text book of Biotechnology- R.C.Dubey, S.Chand Publications, 2014

HOSPITAL MANAGEMENT

Aim:

The aim of this course is to enable the participants to understand the principles and practice of management and its application in hospitals.

Course Objectives:

This course aims to make understand the principles and practice of management. At the end of the course the students would be able to accept professional management practice in healthcare.

Course Outcomes:

- i. Understand the theories of management.
- ii. Understand the management process and integrated approach in management.
- iii. Manage service organizations by accepting the inbuilt challenges.

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- iv. Manage hospitals by understanding the complexity, levels and role of hospital administrator.
- v. Understand the current issues that have an implication in administration practice hospital administration

Unit I: Introduction to Hospital management: Eligibility and personal skills required for Hospital management. Job opportunities in Hospital management. Important hospital management Institutes in India and around the World.

Unit II: Hospital management system: Benefits and Modules of Hospital management systems. Interfacing of analyzer. Pathology lab management. Radiology, Blood Bank, Pharmacology, management softwares.

Unit III: Health Care Services: Health and Hospitals Services, Classification and Characteristics of Service Organizations, , Healthcare Revolution, Dimensions of Health, Indicators of Health- Composition of Health Sector, Types of Care, Pyramidal Structure of Health Services, Hospitals, Types of Hospitals and Role of Hospital in Healthcare.

Unit IV: Health care Facilities: Functioning of modern hospitals & 'changing need of patients Hospitality in Hospital Care, Invasive and non-invasive diagnostic facilities in modern hospital Care offered in Specialty and Super specialty Hospitals.

Unit V: Health and Management: Current Issues in Healthcare Accreditation-Tele medicine-Health Tourism-Health Insurance and Managed Care-Disaster Management-Hospital Wastes Management.

REFERENCE BOOKS:

1. Grant's Method of Anatomy: A Clinical Problem-solving Approach (BI Waverly Pvt. Ltd., New Delhi) John V. Baemajian and Charles E. Stonecker, ISBN 81-7431-033-9, 1989.
2. Anatomy and Physiology for Nurses by, Watson, Roger, ISBN 9780702043581, 2013.
3. Textbook of Preventive and Social Medicine (M/S Banarsidas Bhanot Elaine La Monica, J.E. Park and K. Park, Management in Health Care (Macmillan Press Ltd, London) 2011.
4. Principles of Hospital Administration and Planning (Jaypee Brothers Medical Publishers Pvt. Ltd., New Delhi), B.M. Sakharkar, 2009.
5. Hospital Administration (Jaypee Brothers Medical Publishers Pvt. Ltd., New Delhi), C.M. Francis and et al., 2004. 6. Management Process in Health Care (Voluntary Health Association of India, S. Srinivasan (ed.), New Delhi), 1992.

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தமிழ் இலக்கிய வரலாறு

நோக்கம்:

1. மாணவர்களின் படைப்புத்திறனை வெளிக்கொணர்தலும் மேம்படுத்தலும்.
2. படைப்பின் இன்றியமையாமையை உணர்த்துதல்.
3. படைப்பாளியின் பணிபு, ஆளுமை, திறமை போன்றவற்றை அறியச் செய்தல்.
4. படைப்பாளிகளை அழைத்துப் பயிலரங்கம் நடத்துதல்.

அலகு-1

சங்கம் பற்றிய செய்திகள் - முச்சங்கங்கள் - சங்க இலக்கியங்கள் - பாட்டும் தொகையும்

அலகு-2

சங்கம் மருவிய காலம் - சங்கம் மருவிய கால இலக்கியங்கள் - இரட்டைக் காப்பியங்கள் பதினென்கிழ்கணக்கு நூல்கள் மற்றும் வரலாறு.

அலகு-3

ஐம்பெரும் காப்பியங்கள் - ஐஞ்சிறுகாப்பியங்கள் - கம்பராமாயணம் - பெரியபுராணம் - பிறகாப்பியங்கள் - சிறாப்புராணம் - தேம்பாவணி.

அலகு-4

பக்தி இலக்கியங்கள் - சிற்றிலக்கியங்கள் - பிள்ளைத்தமிழ் - கலம்பகம் - உலா - தூது - பரணி - அந்தாதி - தனிப்பாடல்கள்.

அலகு-5

இக்கால இலக்கியங்கள் - மரபுக்கவிதை - புதுக்கவிதை - உரைநடை - சிறுகதை - புதினம் - நாடகம் - கட்டுரை - இலக்கியம்

பார்வை நூல்கள்

தமிழ்இலக்கியவரலாறு - மு.வரதராசனாஜி சாகித்திய அகாடமி வெளியீடு.

தமிழ்இலக்கியவரலாறு - ச.கபாஷ் சந்திரபோஸ், இயல் பதிப்பகம்.

தமிழ்இலக்கியவரலாறு - முனைவர் பாக்யமேரி, ஷேடர் சென்னை.

தமிழ்இலக்கியவரலாறு - முனைவர் க.ஆனந்தன், ஷேடர் சென்னை

வினைவுகள்

1. தமிழ்நாடு அரசுப்பணிக்குப் பயன்படும்.
2. நூலாராய்ச்சிக்கு உதவும்.
3. தமிழாசிரியர் பணிக்குச் செல்ல முடியும்.
4. வரலாற்று ஆராய்ச்சிக்கு வித்திடும்.
5. பன்முக ஆய்வுக்கு அடித்தளமாக இருப்பதை அறிய முடியும்.
6. உயர்கல்விக்குச் செல்ல வேண்டுமென்ற ஆர்வம் ஏற்படும்.

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BANKING SERVICE

Aim:

To provide the bank is financial institution which is involved in borrowing and lending money.

Course Objective:

- To provide a lending money to firms, customers and home buyers.
- To provide keep money for customers
- To provide offering financial advice and related financial services, such as insurance.

Course Outcome:

- To help to gather knowledge on banking and financial system in India
- To provide knowledge about commercial banks and its products
- To create awareness about modern banking services like e-banking-banking and internet banking, ATM System
- To introduce recent trends in banking system
- To make the student understand the basic concept of banking and financial institutions and expose various types of risk based by banks

UNIT – I

Commercial Banking – An Overview: Banking-Classification- Banking system- Universal Banking- Commercial Banking- functions – Role of Banks in Economic Development

UNIT – II

E-banking –An Overview: Meaning-Service-E-banking and Financial Services –Benefits- Internet Banking –Internet Banking Vs Traditional Banking –Mechanics of Internet Banking- Services

UNIT – III

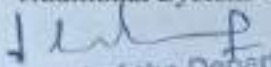
Mobile Banking and Telephone Banking –An Overview: Meaning-Features- Registration- Services –Security Issues –Banking Facilities- Telephone Banking System – Drawbacks- Call Centers

Unit – IV

ATM and Electronic Money: Concept of ATM-Features-Functions-Strategic importance of ATM- Electronic Money – Categories –Merits – E-Money and Monetary Policy-Policy Issues for the RBI

Unit-V

EFT System and INFINET: Meaning- Steps in EFT- RBI Guidelines-EFT Systems Vs Traditional System - ECS-Features-Factors- Benefits –Handicaps -Applications


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References Books

1. Banking theory law and Practice
2. Banking Theory law and practice -Santhanam
3. Banking Awareness - N.K.Gupta
4. Management of Banking and financial Services-Padmalathasuresh, Justin paul

NEURO BIOCHEMISTRY

Aim:

The course aims to provide students with a basic understanding of:

- the principles and major mechanisms of metabolic control and of molecular signaling by hormones;
- the control of cell proliferation

Objective:

By the end of the course, students should be able to:

- demonstrate knowledge and understanding of the molecular machinery of living cells;
- demonstrate knowledge and understanding of the principles that govern the structures of macromolecules and their participation in molecular recognition;
- use basic laboratory skills and apparatus to obtain reproducible data from biochemical experiments.

Course outcomes:

CO1 To understand various neurological system

CO2 Recognize the need for, and engage in life-long learning in neurological system

CO3 To understand various Exocytosis of neurotransmitter

CO4 To able to understand DNA microarrays, Methodology, types and applications

CO5 To acquire knowledge related to LEARNING AND MEMORY

CO6 Gain knowledge of contemporary issues

CO7 to understand BIOCHEMISTRY OF VISION AND MUSCLE CONTRACTION

UNIT I

NERVOUS SYSTEM

Structure and function of the brain. Central Nervous System, Peripheral and Autonomic Nervous system. Cells of Nervous System - Neurons, Astrocytes, Glial cells, Oligodendrocytes and Schwann cells. Chemical composition of brain – utilization and uptake of glucose and amino acids, Blood – Brain barrier.

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UNIT II

NEUROTRANSMISSION

Membrane potentials, Resting potential - Depolarization, repolarization and hyperpolarization, Action potential. Mechanism of axonal neurotransmission. Membrane channels - Types of channels, ion gated, voltage gated, chemically gated, mechanically gated and responsive to intracellular messengers. DISEASES OF NERVOUS SYSTEM Molecular basis of Parkinson's disease, Alzheimer's disease, Schizophrenia, Myasthenia gravis and Multiple sclerosis.

UNIT III

NEUROTRANSMITTERS

Synthesis, storage, release, uptake, degradation and action of neurotransmitters. Acetylcholine, GABA, Serotonin, Dopamine, Glutamate, Aspartate, Nitrous oxide, etc. Neuropeptides. Synaptic transmission - Cholinergic receptors - Nicotinic and Muscarinic receptors, Agonists and Antagonists - their mode of action and effects. Adrenergic receptors, serpentine receptors and intracellular signaling. Fast and slow receptors. Exocytosis of neurotransmitter - Role of synapsins, synaptotagmins, SNAP, SNARE and other proteins in docking, exocytosis and recycling of vesicles.

UNIT IV

LEARNING AND MEMORY

Mechanism of short term memory and Long Term Potentiation. NMDA and AMPA glutamate receptors. Retrograde messengers in synaptic transmission. Role of CAM kinase II, Calcium, protein kinases, cAMP, NO, Calpain and other proteins in memory and learning process. Synaptic plasticity INTERACTION OF DRUGS WITH CNS Mechanism of action of anesthetics, analgesics, hallucinogens, depressants, stimulants and toxins on the nervous system. Addiction and drugs of abuse.

UNIT IV

BIOCHEMISTRY OF VISION AND MUSCLE CONTRACTION:

Rod and cone cells, visual cycle, mechanism and regulation of vision, color vision. Thick and thin filaments, interaction of actin and myosin muscle contraction, role of calcium and regulation of muscle contraction. Smooth muscle contraction and its regulation

REFERENCE

1. Neurochemistry by Ferdinand Hucho, VCH Publication, 1986
2. Molecular cell Biology, by Lodish, Baltimore, et al W.H. Freeman & Co. 1996
3. Basic Neurochemistry by M. P. Spiegel

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MOLECULAR BASIS OF DISEASES

Aim: This paper provides a thorough knowledge about molecular structure and function of cells, molecular mechanism of diseases.

Course objectives:

The syllabi of Molecular compliments and supplements the necessary knowledge students have gained in Physiology. Consequently, it incorporates topics like Drug resistance, inflammation, Vaccines, cellular ageing and other infectious diseases. It also provides the necessary inputs for the other disciplines like Pharmacology, social and preventive medicine, medicinal biochemistry etc.

Course outcomes: After the completion of this course, the student will be able to

- CO1 Attain a thorough knowledge on the molecular mechanisms for Tuberculosis, Typhoid, Cholera
- CO2 Understand the pathological changes during infectious diseases.
- CO3 Provide an insight into the history of pathology covering all the basic definitions and common terms.
- CO4 Detail on the survival mechanism in diseases, an insight into microscopic and cellular pathology.
- CO5 Elaborate the overview of Dengue Hemorrhagic Fever, and Chlamydiae, opportunistic fungal pathogens
- CO6 review the causes and mechanisms of Emerging and re-emerging infectious diseases and pathogens

UNIT I:

Overview of infectious diseases, infectious agents - Bacteria, Viruses, protozoa and fungi, pathogenicity and virulence; Facultative / obligate intracellular pathogens.

UNIT II:

Emerging and re-emerging infectious diseases and pathogens including X-MDR M. tuberculosis, MRSA, SARS virus, Bird flu, prions, AIDS, Dengue Hemorrhagic Fever, and Chlamydiae, opportunistic fungal pathogens.

UNIT III:

Viral diseases, epidemiology, signs and symptoms, causative agent, history, infection and pathogenesis, Detection, Drugs and inhibitors, Vaccines, molecular mechanisms for AIDS, hepatitis, influenza, dengue, polio, herpes.

UNIT IV:

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Bacterial disease, epidemiology, signs and symptoms, causative agent, history, infection and pathogenicity, Diagnostics, Therapeutics and vaccines. Drug resistance, mechanisms, Multidrug efflux pumps, extended spectrum β -lactamases (ESBL) and implications on public health, molecular mechanisms for Tuberculosis, Typhoid, Cholera.

UNIT V:

Parasitic diseases epidemiology, signs and symptoms, causative agents, history, Vectors, life cycle, Host parasite interactions, Diagnostics, Drugs and Inhibitors, Resistance, Vaccine development, molecular mechanisms for Malaria.

References

1. Klein's Microbiology (2008) 7th Ed., Prescott, Harley, Willey, J.M., Sherwood, L.M., Woolverton, C.J. Mc Graw Hill International Edition (New York) ISBN: 978-007-126727.
2. Principles and practices of Infectious diseases, 7th edition, Mandell, Douglas and Bennett. S, Volume, 2. Churchill Livingstone Elsevier. ISBN: 978-0-443-06839-3
3. Sherris Medical Microbiology: An Introduction to Infectious Diseases. (2010). Kenneth J. Ryan, C. George Ray, Publisher: McGraw-Hill. ISBN-13: 978-0071604024 ISBN-10: 0071604022
4. Medical Microbiology. (2012). Patrick R. Murray, Ken S. Rosenthal, Michael A. Pfaller, Elsevier Health Sciences. ISBN: 978-0-323-08692-9.
5. Bacterial Pathogenesis: A molecular approach by Salyers AA and Whitt DD eds. American Society for Microbiology Press, Washington, DC USA. 2002

ENVIRONMENTAL BIOCHEMISTRY

Aim : To understand the fundamental chemical principles that govern complex biological systems.

Course objective: To provide knowledge about biochemistry of environmental processes and ecology.

Course outcomes

CO1 students will be able to explain the fundamentals of earth atmosphere and its interconnectivity between various components.

CO2 students will be able to describe different elements of the environments and their impact on sustaining the environment.

CO3 students will be able to interpret the fundamentals of ecology and its role in biological evolution

CO4 Gain knowledge about pollution control

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CO5 understand the importance of Structure and functions of ecosystem

CO6 exposure with the importance of Value of Biodiversity

UNIT I

Definition, scope and importance. Concept of an ecosystem. Structure and functions of the ecosystem. Producers, consumers and decomposers. Energy flows in an ecosystem. Ecological succession. Food chains, food webs and ecological pyramids Introduction, types, characteristic features, structure and function of the following ecosystem. Forest ecosystem, Grassland ecosystem, Desert ecosystem, Aquatic ecosystems (Pond, streams, lakes, rivers, oceans, estuaries).

UNIT II

Causes, effects and control measure of, Air pollution, Water pollution, Soil pollution, Noise pollution, Thermal Pollution, Bioleaching.

UNIT III

Introduction – Definition, genetic, species and ecosystem diversity. Value of Biodiversity: Consumptive use, Productive uses social, ethical, aesthetic and option values. Biodiversity at global, National and local levels. Hotspots of biodiversity, Threats to biodiversity Endangered and endemic species of India Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.

UNIT IV

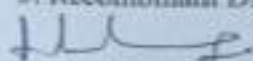
Enzymes: Immobilization of enzymes, enzymes engineering, isolation and culturing of microorganisms, production of enzymes, fermentation, antibiotics, use of microbes to treat sewage water and industrial effluents and mining.

UNIT V

Pollution Control: Cleaner technologies, reducing environment impact of industrial effluents, chemical pesticides, herbicides and fertilizers. Renewable source of energy through waste materials; biogas, energy crops, cellulose current levels of biodiversity and gene banks.

REFERENCES:

1. Elements of biotechnology, P.K.Gupta, Rastogi and Company, Meerut, India.
2. An Introduction to Genetic Engineering, Desmond S.T.Nicoll-Cambridge University.
3. Biotechnology, Kesar, Trehar Wiley, Eastern India.
4. Microbiology, Michael Pelczar, Tata-Mc Graw Hill Publishing Company, New Delhi.
5. Recombinant DNA-a short course, J.D.Watson, Scientific American Bank.



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MOLECULAR AND ENVIRONMENTAL BIOCHEMISTRY LAB

AIM: This paper to study laboratory techniques in both molecular biology and environmental biochemistry, and be able to apply the scientific method to the processes of experimentation and Hypothesis testing.

COURSE OBJECTIVES: The course aims to develop skills of performing basic molecular and environmental biochemical tests important in clinical investigations, to develop familiarity with molecular and biochemical laboratory techniques, and to introduce students to various practical aspects of molecular biology and their correlation in disease conditions.

COURSE OUTCOMES:

CO1 After the completion of this course, the student will be able to Learn how to isolate genomic DNA.

CO2 Track various techniques adopted for separation of DNA.

CO3 Demonstrate separation of protein by Western blotting and Animal Tissue culture.

CO4 Separate chromosomal and plasmid DNA using enzymes.

CO5 Gain the knowledge about COD and BOD

CO6 demonstrate basis of Animal tissue culture

EXPERIMENTS:

1. Isolation & Purification of genomic DNA from bacteria
2. Isolation & Purification of plasmid DNA
3. Agarose gel electrophoresis of chromosomal & plasmid DNA
4. Restriction Digestion of chromosomal & plasmid DNA
5. Isolation of DNA fragment from agarose gel
6. Western blotting (Demonstration only).
7. Animal tissue culture (demonstration only).
8. Determination of BOD and COD form contaminated water
9. Bacterial examination of drinking water by MPN techniques

REFERENCE

1. J Sambrook & D. W. Russell (2001). Molecular cloning: a laboratory manual Vol 1,2 & 3, CSHL Press.
2. Principles and Techniques of Biochemistry and Molecular Biology, K. Wilson and J. Walker (2006), Cambridge University Press
3. Molecular Biomethods Handbook, J.M. Walker (2008), Humana Press.
4. Molecular Cloning: A Laboratory Manual (1989), 2nd ed.. Cold Spring Harbor

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MEDICAL BIOTECHNOLOGY

AIM: this paper provides information about the History and scope of medical biotechnology, current status and future prospects.

Course Objectives: To enlighten the knowledge of the Students on different areas of Medical

Biotechnology. To train the Students in a hospital based setup and familiarize them with the clinical diagnostics of diseases.

Course Outcomes (CLO):

CO1 Explain insights about genetic diseases and also about the molecular aspects related to human disease

CO2 Gain new insights into molecular mechanisms of nucleic acid and gene therapy

CO3 Gain knowledge about therapeutic recombinant proteins and immunotherapy for the treatment of different diseases

CO4 understand then Nucleic acid based Therapy

CO5 exposure with Gene therapy

CO6 able to interpret the molecular basis of diseases

Unit I:

Classification of genetic diseases: Chromosomal disorders – Numerical disorders e.g. trisomies & monosomies, Structural disorders e.g. deletions, duplications, translocations & inversions, Chromosomal instability syndromes. Gene controlled diseases – Autosomal and X-linked disorders, Mitochondrial disorders.

Unit II:

Molecular basis of human diseases: - Pathogenic mutations Gain of function mutations: Oncogenes, Huntingtons Disease, Pittsburg variant of alpha 1 antitrypsin. Loss of function - Tumor Suppressor. Genomic. Dynamic Mutations - Fragile- X syndrome, Myotonic dystrophy. Mitochondrial diseases

Unit III:

Gene therapy: Ex-vivo, In vivo, In situ gene therapy, Strategies of gene therapy: gene augmentation Vectors used in gene therapy Biological vectors – retrovirus, adenoviruses, Herpes Synthetic vectors-- liposomes, receptor mediated gene transfer. Gene therapy trials – Familial Hypercholesterolemia, ADA, AIDS, Cystic Fibrosis, Solid tumors.

Unit IV:

Nucleic acid based Therapy: Gene silencing technology, siRNA, Aptamers, antisense oligodeoxynucleotides (AS-ODN), Ribozymes, Peptide Nucleic Acids, Clinical management

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and Metabolic syndrome: – PKU, Familial Hypercholesterolemia, Rickets, ADA, Congenital hypothyroidism.

UNIT V:

Recombinant & Immunotherapy; Clinical applications of recombinant technology; Erythropoietin; Insulin analogs and its role in diabetes; Recombinant human growth hormone; Streptokinase and urokinase in thrombosis; Recombinant coagulation factors; Monoclonal antibodies and their role in cancer; Role of recombinant interferons; Immunostimulants; Immunosuppressors in organ transplants; Role of cytokine therapy in cancers;

REFERENCE

1. Diagnostic and Therapeutic Antibodies (Methods in Molecular Medicine by Andrew J.T. George (Editor), Catherine E. Urich (Editor) Publisher: Humana Press; edition (2000)
2. Molecular Diagnosis of Infectious Diseases (Methods in Molecular Medicine) by Jochen Decker, U. Reischl Amazon
3. Human Molecular Genetics by T. Strachan, Andrew Read Amazon Sales Rank
4. Culture of Animal Cells- A manual of basic techniques by R.I. Freshney
5. Barry R Bloom, Paul-Henri Lambert 2002. The Vaccine Book. Academic Press
6. Lodish et al., Molecular cell Biology, 4th Edition, W.H. Freeman & Company, 2000.
7. Smith & Wood, Cell Biology, 2nd Edition, Chapman & Hall, London, 1996.
8. Watson et al., Molecular Biology of the gene, 5th Edition, Pearson Prentice Hall, USA, 2003

APPLIED MICROBIAL BIOCHEMISTRY

AIM:

Students will gain knowledge about different energy sources such as inorganic compounds, organic compounds and visible radiation for organisms.

COURSE OBJECTIVES:

- To provide knowledge about microbial culture techniques.
- To learn the concepts of different energy sources.
- To provide knowledge about industrial application of microbes.

COURSE OUTCOME:

CO1 Will be acquainted with methods of measuring microbial growth, calculating growth kinetic parameters with understanding of steady state and continuous growth.

CO2 Will have gained an in-depth knowledge of primary, secondary and group translocation transport systems existing in bacteria, simultaneously learning membrane transport proteins and kinetics of solute transport.

CO3 Will have learnt central metabolic pathways for carbon metabolism in bacteria enlisting differences with eukaryotic systems and their regulation in diverse physiological conditions. This allows students to apply the acquired knowledge in engineering metabolic pathways for developing industrially useful strains.

CO4 Will have gathered understanding of inorganic and organic nitrogen assimilation and its regulation. Also knows the role of glutathione in cellular redox regulation and biochemistry of glutamate overproducing strains.

CO5 will have learnt Microbial products in pharmaceutical and agriculture industry

CO6 exposure with Medical microbiology and microbial metabolism

Unit-I: Microbiological techniques

Culture techniques: Isolation of microbes from various sources, serial dilution techniques, pure culture techniques, anaerobic culture methods – chemical and physical methods. Culture preservation techniques. Nutritional requirements: - different kinds of media, composition of media-carbon sources, nitrogen sources, vitamin and growth factors, minerals, inducers, precursors and inhibitors. Sterilization methods.

Unit-II: Sources of energy

Energy from inorganic compounds - ET in chemolithotrophs, production of reducing power in chemolithotrophs; Energy from visible radiation – photosynthesis in eukaryotes, blue-green algae, bacteria. Bioenergy: Renewable and non-renewable energy sources – Green technology - Biofuels, biogas, bioethanol.

Unit III- Microbial metabolism overview.

Photosynthesis in microbes. Role of chlorophylls, carotenoids and phycobilins, Calvin cycle. Chemolithotrophy; Hydrogen- iron- nitrite oxidizing bacteria; nitrate and sulfate reduction; methanogenesis and acetogenesis, fermentations- diversity, syntrophy-role of anoxic decompositions. Nitrogen metabolism, nitrogen fixation, hydrocarbon transformation.

Unit-IV: Medical microbiology

Infectious Diseases process – Diagnosis – Process of sample collection, transport and examinations of the specimens. Antibioqram. Bacteriology: Morphology, cultural characteristics, pathogenicity and laboratory diagnosis of Gram positive organisms - *Staphylococcus aureus*, *Mycoplasma*; Gram negative organisms: *E. coli*. Infections,

antimicrobial agents for textiles, international standards for the assessment of antimicrobial activity of textiles.

Unit-V: Microbial products in pharmaceutical and agriculture industry: Production, harvest, recovery and uses- Enzymes, Antibiotics (Penicillins, Tetracycline), vitamins (B2, B12), Aminoacids (lysine, glutamic acid).

Reference Books:

1. Pelczar, M.J., Chan, E.C. and Krieg, N.R. (2006) *Microbiology*, 6th Edition, Tata McGraw Hill Publishing Company Ltd, New Delhi.
2. Prescott (2008), *Microbiology*, 7th edition, McGraw Hill International Edition, New York.
3. Tortora, G.J., Funke, B.R. and Case, C.L. (2009) *Microbiology*, 2nd edition, Pearson Education, Inc.
4. Talaro, K.P. and Talaro, A. (2008) *Foundations in Microbiology*, Tata McGraw Hill Publishers, New York.
5. Yuan Gao and Robin Cranston. Recent Advances in Antimicrobial Treatments of Textiles, *Textile Research Journal*, 2008 78: 60. SAGE publications.
6. *Microbiology 4th ed-* Davis, Lippincott Williams and Wilkins, 1989.



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VALUE ADDED COURSES

CLINICAL NUTRITION AND DIETETICS

Aim:

- To introduce students to Clinical nutrition and dietetics

COURSE OBJECTIVE

- To generate trained Nutritionist and Dietician who will work in hospitals, clinics, nursing homes or any other health facilities and also in organizations where nutrition and dietetics related works including counseling is offered to the clients. They may practice as Dieticians after proper entitlement.

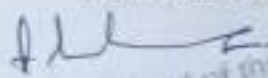
COURSE OUTCOME

- Students will gain the knowledge regarding nutritional classification of food, method and media of cooking, nutritive value and processing, storage of plant based foods
- Understand the functions and sources of nutrients, role of nutrients in maintenance of good health.
- Able to understand the physiological processes and functions as applicable to human nutrition
- Gain knowledge regarding nutritive value, classification, processing, preservation and storage of animal foods. Also students understand the medicinal value of Indian spices and condiments
- Students are able to understand principles of diet therapy, modification of normal diet for therapeutic purposes and the role of dietitian.

UNIT – I: Role of Dietitian - Diet Therapy - Routine hospital diet, Regular diet, Light diet, Soft Diet, Full liquid diet - Diet in fevers and infections – Typhoid, Malaria and Tuberculosis - Diet in gastrointestinal disorders: Diarrhea, Constipation, Peptic ulcer. Diet in Diabetes mellitus - Classification, predisposing factors, Diagnosis, Dietary management - Diet in Cardiovascular diseases - Dietary management in Atherosclerosis and hypertension - Diet in diseases of liver and gallbladder

UNIT – II: Concept of Community Nutrition - Nutritional problems confronting our country - Causes of malnutrition in India - Methods of assessment of nutritional status - Malnutrition & Infection. National and International agencies in community nutrition ICDS, SNP, AMP, WHO, UNICEF, NIN, CFTRI - Nutrition Education - Importance of nutrition education - Nutrition education methods - Immunization Programme

Unit - III: Principles of Nutrition and Nutritional Biochemistry Nutrients- Carbohydrates, proteins, lipids and functions, Energy, Macro and micro elements and functions, fat and water soluble vitamins and functions, Fiber, Water. Medical Nutrition Therapy/Clinical Nutrition/Dietetics/Nutrition in Health and Disease: Non-communicable diseases such as


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cardiovascular disorders, diabetes mellitus, hypertension and renal diseases, pulmonary disorders, Nutrition in critical care, cancer and allergies and food intolerances.

Unit IV: Food Science and Food Microbiology Food groups, Food preparation methods, Food preservation techniques, Food analysis – proximate composition, Sensory analysis and Food processing techniques, Food safety, Food security, and Food hygiene. Nutritional Epidemiology Nutrition research methods- observational, case-control, cohort, randomized control trials, Nutrition surveys and surveillance in India.

Unit V: Public Health Nutrition Nutrition security, Nutritional status, World Health Assembly targets, Trends in breast feeding practices in India. Nutrition through Life Cycle Balanced diet, Meal planning, Nutrition during pregnancy, lactation, infancy, toddlerhood, preschool stage, school going children, and adolescence.

Reference:

1. Handler, P.; Smith E.I.; Stelten, D. W.: Principles of Biochemistry, Mc. Graw Hill Book Co.
2. Lehninger, A.L.; Nelson, D. L. and Cox, M. M. Principles of Biochemistry. CBS Publishers and Distributors.
3. Devlin, T. M.: TextBook of Biochemistry with Clinical Correlations. John Wiley and Sons.
4. Assani, J. Kaur. TextBook of Biochemistry. C.B.S. Publication.
5. Rao, K.R (1986) Textbook of Biochemistry, III edition, Prentice Hall of India Pvt. Ltd, New Delhi-110001.
6. J.M Orton and O.W Neuhans(1982), Human Biochemistry. The C.V Mosby Company, Toronto, London, 10th edition.
7. D. Das Biochemistry, 12th ed, Academic Publishers 1978. 10. J.M. Berg, J.L. Tymoczko, L. Stryer Biochemistry, 5th ed, W.H. Freeman, 2002, New York.
8. Fundamentals of Biochemistry- A. C. Deb

VERMICOMPOST

Aim:

- To introduce students to vermin-composting for Agricultural uses.

Objectives:

- To inculcate concepts of vermicomposting.
- To understand techniques in Vermicomposting.
- To increase employability of the students.
- To improve the soil quality by promoting the biofertilizers.
- To educate about role of Earthworm
- To learn the importance of Earthworms and help to maintain a good soil structure.
- To educate about Recycling of wastes through vermicomposting.

Course Outcomes:

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At the end of this unit, you will be able to:

- Identify correct species of earthworms
- Describe Process of Vermicomposting and Inoculation of earthworms
- Describe maintaining favorable condition in to vermi bed
- Describe preparation of feed and manage Vermicomposting unit
- Describe control of predators , pest and disease attack 6. Describe harvest of Vermiwash

Unit I

Classification – different species of earthworms. Morphology, anatomy and Physiology of earthworms.

Unit II

Types of Vermicomposting – Role of earthworms in soil fertility – vermiculture – vermi-cast – vermi-technology and applications – Physical, chemical and biological properties of vermi-compost.

Unit III

Raw materials for composting – requirements of vermicomposting. Maintenance of composting – Collection of vermicompost – Efficiency of vermicomposting – General problems in production of vermi-composting.

Unit IV

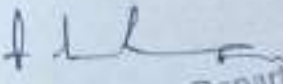
Advantage of vermicomposting – Applications of vermicomposting – Vermicomposting of Agricultural and Urban Solid Wastes – Recycling of wastes through vermicomposting.

Unit V

Small Scale or Indoor vermicomposting – Large scale or outdoor vermicomposting. Effects of vermicompost on soil properties. Vermicompost – Quality & Economics. Prospects of vermi-culture as a self employment venture.

Reference Books

1. R.K. Bhatnagar & R.K. Palta, "Earthworm Vermiculture and Vermicomposting", Kalyani Publishers, No. 1, Mahalakshmi Street, T. Nagar, Chennai -600 017.
2. P.K. Gupta, "Vermi Composting for Sustainable Agriculture", AGROBIOS (India), Agro House, Behind Nasrani Cinema, Chopasani Road, Jodhpur – 342 002.


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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	2019-20
Date and Time	10.05.2019 & 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 10.05.2019. 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 14.05.2018 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 the revision of core and elective courses of UG curriculum

Discussion : The members discussed elaborately about the revision of existing curriculum of UG courses.

It was unanimously planned to revise the syllabi of UG and PG curricula of Physics based on the following aspects:

1. Specific mentioning should be made in the curriculum with respect to
 - Program outcomes
 - Program specific outcomes
 - Course objectives
 - Course outcomes
2. Develop curricula with relevance to
 - Domestic requirements
 - Regional requirements
 - National requirements
 - International requirements
3. Improving existing course with focus on
 - Employability
 - Entrepreneurship
 - Skill development
4. Enlightening existing course with focus on
 - Gender
 - Environment and sustainability
 - Human values and professional ethics

BoS members reviewed the syllabus of each and every course systematically. The followings are the proposed resolutions:

- ⊙ Adding course objectives and outcomes in the syllabus
- ⊙ Improving the content of syllabus with emerging fields

It was obvious that content of core courses was retained without any modification. We have modified the first two digits of course code from '17' to '19'. In addition, new elective course, Numerical Methods and C Programming was introduced in the semester-VI instead of Communication Physics (17113DSC64B). BOS members also suggested to include 3 new value added courses while retaining 4 courses.

Followings are the list of new open elective courses:

- a) 19110OEC-Tamil Ilakkiya Varalaru
- b) 19116OEC-Wildlife Conservation
- c) 19120OEC-E-Learning
- d) 19161OEC-Banking Service

Inclusion of Research Integrated Curriculum

The relationship between teacher and learner is completely different in higher education from what it is in school. At the higher level, the teacher is not there for the sake of the student, both have their justification in the service of scholarship. For the students who are the professionals of the future, developing the ability to investigate problems, make judgments on the basis of sound evidences, take decisions on a rational basis and understand what they are doing and why is vital. Research and inquiry is not just for those who choose to pursue an academic career. It is central to professional life in the twenty-first century.

It is observed that the modern world is characterized by heightened levels of complexity and uncertainty. Fluidity, fuzziness, instability, fragility, unpredictability, indeterminacy, turbulence, changeability, contestability: these are some of the terms that mark out the world of the twenty-first century. Teaching and research is correlated when they are co-related. Growing out of the research on teaching- research relations, the following framework has been developed and widely adopted to help individual staff, course teams and whole institutions analyse their curricula and consider ways of strengthening students understanding of and through research. Curricula can be:

Research – Led: Learning about current research in the discipline

Here the curriculum focus is to ensure that what students learn clearly reflects current and ongoing research in their discipline. This may include research done by staff teaching them.

Research – Oriented: Developing research skills and techniques

Here the focus is on developing student's knowledge of and ability to carry out the research methodologies and methods appropriate to their discipline(s)

Research – Based: Undertaking research and inquiry

Here the curriculum focus is on ensuring that as much as possible the student learns in research and or inquiry mode (i.e. the students become producers of knowledge not just consumers). The strongest curricula form of this is in those special undergraduate programmes for selected students, but such research and inquiry may also be mainstreamed for all or many students.

Research- Tutored: engaging in research discussions

Here the focus is on students and staff critically discussing ongoing research in the discipline.

All four ways of engaging students with research and inquiry are valid and valuable and curricula can and should contain elements of them.

Moreover, the student participation in research may be classified as,

Level 1: Prescribed Research

Level 2: Bounded Research

Level 3: Scaffolded Research

Level 4: Self actuated Research

Level 5: Open Research

Taking into consideration the above mentioned facts in respect of integrating research into the B.Sc (Physics)curriculum, the following Research Skill Based Courses are introduced in the B.Sc (Physics)curriculum.

Semester	RSB Courses	Credits
II	Research Led Seminar	1
III	Research Methodology	3
V	Participation in Bounded Research	2

VI	Project Work	4
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Blueprint for assessment of student's performance in Research Led Seminar Course

• Internal Assessment:	40 Marks
• Seminar Report (UG)/Concept Note(PG) : 5 X 4= 20 Marks	
• Seminar Review Presentation : 10 Marks	
• Literature Survey : 10 Marks	
• Semester Examination : Marks	60
(Essay type Questions set by the concerned resource persons)	

Blueprint for assessment of student's performance in Research Methodology Courses

Continuous Internal Assessment:	20 Marks
• Research Tools(Lab) :	10 Marks
• Tutorial:	10 Marks
Model Paper Writing:	40 Marks
• Abstract:	5 Marks
• Introduction:	10 Marks
• Discussion:	10 Marks
• Review of Literature:	5 Marks
• Presentation:	10 Marks
Semester Examination:	40 Marks
Total:	100 Marks

Resolution: The board members recommended the above mentioned suggestions in UG curriculum

Agendum 3: Discussion about the revision of core and elective courses of PG curriculum

Discussion : The members discussed elaborately about the existing curriculum of PG courses. It was decided that content of core courses was retained without any modification. We have modified the first two digits of course code from '19' to '20'.

It was planned that content of core courses was retained without any modification. Nevertheless, 3 new elective courses were introduced in the semesters (II and III). BOS members also recommended to include some new value added courses.

New elective course, Materials Science (19213DSC25B) was included instead of Radiation Physics (17213DSC25B) in the semester – II.

New elective course, Photonics Devices and Applications (19213DSC34A) was included instead of Non-Conventional Energy Physics (17213DSC34A) in the semester – III.

Incorporation of Research Integrated Curriculum

The relationship between teacher and learner is completely different in higher education from what it is in school. At the higher level, the teacher is not there for the sake of the student, both have their justification in the service of scholarship. For the students who are the professionals of the future, developing the ability to investigate problems, make judgments on the basis of sound evidences, take decisions on a rational basis and understand what they are doing and why is vital. Research and inquiry is not just for those who choose to pursue an academic career. It is central to professional life in the twenty-first century.

It is observed that the modern world is characterized by heightened levels of complexity and uncertainty. Fluidity, fuzziness, instability, fragility, unpredictability, indeterminacy, turbulence, changeability, contestability: these are some of the terms that mark out the world of the twenty-first century. Teaching and research is correlated when they are co-related. Growing out of the research on teaching- research relations, the following framework has been developed and widely adopted to help individual staff, course teams and whole institutions analyse their curricula and consider ways of strengthening students understanding of and through research. Curricula can be:

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Research – Oriented: Developing research skills and techniques

Here the focus is on developing student's knowledge of and ability to carry out the research methodologies and methods appropriate to their discipline(s)

Research – Based: Undertaking research and inquiry

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Research- Tutored: engaging in research discussions

Here the focus is on students and staff critically discussing ongoing research in the discipline.

All four ways of engaging students with research and inquiry are valid and valuable and curricula can and should contain elements of them.

Moreover, the student participation in research may be classified as,

Level 1: Prescribed Research

Level 2: Bounded Research

Semester	RSB Courses	Credits
I	Research Led Seminar	1
II	Research Methodology	3
II	Participation in Bounded Research	2
III	Design Project/ Socio Technical Project (Scaffolding Research)	4

IV	Project Work	12
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Level 3: Scaffolded Research

Level 4: Self actuated Research

Level 5: Open Research

Taking into consideration the above mentioned facts in respect of integrating research into the M.Sc (Physics) curriculum, the following Research Skill Based Courses are introduced in the curriculum.

Blueprint for assessment of student's performance in Research Led Seminar Course

- **Internal Assessment:** 40 Marks
 - Seminar Report (UG)/Concept Note(PG) : 5 X 4= 20 Marks
 - Seminar Review Presentation : 10 Marks
 - Literature Survey : 10 Marks
- **Semester Examination :** 60 Marks

(Essay type Questions set by the concerned resource persons)

Blueprint for assessment of student's performance in Socio Technical Project

- **Continuous Internal Assessment through Reviews:** 40 Marks
 - Review I : 10 Marks
 - Review II : 10 Marks
 - Review III : 20 Marks
- **Evaluation of Socio Technical Practicum Final Report:** 40 Marks
- **Viva- Voce Examination:** 20 Marks
- **Total:** 100 Marks

Blueprint for assessment of student's performance in Research Methodology Courses

- **Continuous Internal Assessment:** 20 Marks


• Research Tools(Lab) :	10 Marks
• Tutorial:	10 Marks
Model Paper Writing:	40 Marks
• Abstract:	5 Marks
• Introduction:	10 Marks
• Discussion:	10 Marks
• Review of Literature:	5 Marks
• Presentation:	10 Marks
Semester Examination:	40 Marks
Total:	100 Marks
Resolution: The board members approved the above suggestions in PG curriculum	

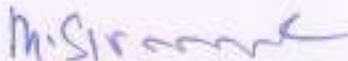
Agendum 4: Organizing industrial visit for students
Discussion: External expert suggested that final year B.Sc., and M.Sc., students have to be allowed to go for industrial visit so that the students can get industrial exposure. External expert can also impart internship training to the students.
Resolution: 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: 10.05.2019


 Dean of Arts & Science
 PRIST Deemed to be University
 Thanjavur - 613 003, Tamilnadu.



Signature
 (Dr. M. Sivanantham)

BOS Chairman/HOD Seal

The Head, Department of Physics
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 Vailam, Thanjavur-613403
 Tamilnadu, India.

ATTENDANCE OF THE BOARD OF STUDIES MEETING

Board: Physics

Date: 10.05.2019

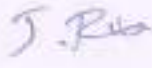
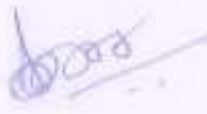
Time: 10:00 am

Venue: Department of Physics

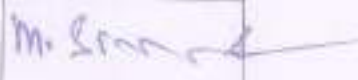


The following members were present for the Board of Studies meeting

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. K. Ravichandran, M.Sc., M. Phil., M.Ed., Ph.D., Associate Professor & HOD	Post Graduate & Research Department of Physics, AVVM Sri Pushpam College (Autonomous), Poondi-613503	
2	Wg Cdr M. Jeyakumar, M.A., PGDPRM, MBA, CEO, nRoot Consultancy	nRoot Consultancy, RS No.139/B1, nRootHead quarters, MappillaiNayakampatti, Near Air force Station, Thanjavur - 613 403	

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	Sutapa
5	Dr. V. Vidhya M.Sc., M.Phil., Ph.D, Assistant Professor	Physics	V. Vidhya
6	Mr. K. Swaminathan, M.Sc., M.Phil., Assistant Professor	Physics	K. Swaminathan
7	Dr. K. Thirunavukarasu M.Sc., M.Phil., Ph.D, Assistant Professor	Physics	K. Thirunavukarasu

Date: 10.05.2019



Dept of Arts & Science
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Thanjavur - 613 003, Tamilnadu.



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. Numerical Methods and C Programming
2. Tamil Ilakkiya Varalaru
3. Wildlife Conservation
4. E-Learning
5. Banking Service
6. Materials Science
7. Photonics Devices and Applications

List of new value-added courses

1. Certificate course on Physics for Everyday Life
2. Certificate course on Photovoltaics for Energy Conversion
3. Certificate course on Communication Physics

B.Sc., PHYSICS - COURSE STRUCTURE

Course Code	Course Title	L	T	P	C
SEMESTER I					
19110AEC11	Tamil-I	4	0	0	2
19111AEC11	Advanced English-I				
19132AEC11	Hindi-I				
19135AEC11	French-I				
19111AEC12	English-I	4	0	0	2
19113AEC13	Properties of Matter	6	1	0	4
19113SEC14L	Properties of Matter Lab	0	0	3	2
19112AEC15A	Calculus and Fourier series	5	0	0	4
19112AEC16A	Algebra and Trigonometry	4	0	0	3
191 SEC01	Skill Based Elective-I	0	0	2	1
19111SEC01L	Communicative English Lab-I	0	0	1	1
191INDCONS	Indian Constitution	-	-	-	-
	Total	23	1	6	19
SEMESTER II					
19110AEC21	Tamil-II	4	0	0	2
19111AEC21	Advanced English-II				
19132AEC21	Hindi-II				
19135AEC21	French-II				
19111AEC22	English-II	4	0	0	2
19113AEC23	Mechanics And special theory of Relativity	6	1	0	4
19113SEC24L	Mechanics Lab	0	0	3	2
19112AEC25A	ODE,PDE and Laplace Transform	5	0	0	4
19112AEC26A	Analytical Geometry in Vector Calculus	4	0	0	3
19113RLC27	Research Led Seminar	-	-	-	1
191 SEC02	Skill Based Elective -II	0	0	2	1
19111SEC02L	Communicative English Lab-II	0	0	1	1
	Total	23	1	6	20
SEMESTER III					
19110AEC31	Tamil-III	4	0	0	2
19111AEC31	Advanced English-III				
19132AEC31	Hindi-III				
19135AEC31	French-III				
19111AEC32	English-III	4	0	0	2
19113AEC33	Heat and Thermodynamics	5	0	0	4
19113SEC34L	Heat and Thermodynamics lab	0	0	3	2
19114AEC35	Chemistry-I	6	0	0	5
19114SEC36L	Volumetric Analysis lab- I	0	0	3	2
19113RMC37	Research Methodology	2	0	0	2
191 SEC03	Skill based Elective- III	0	0	2	1

19111SEC03L	Communicative English Lab-III	0	0	1	1
	Total	21	0	9	21
	SEMESTER IV				
19110AEC41	Tamil-IV	4	0	0	2
19111AEC41	Advanced English-IV				
19132AEC41	Hindi-IV				
19135AEC41	French-IV				
19111AEC42	English-IV	4	0	0	2
19113AEC43	Optics	5	0	0	4
19113SEC44L	Optics Lab	0	0	3	2
19114AEC45	Chemistry-II	6	0	0	5
19114SEC46L	Volumetric Analysis Lab -II	0	0	3	2
19__SEC04__	Skill based Elective- IV	0	0	2	1
19111SEC04L	Communicative English Lab-IV	0	0	1	1
191ENVTSTU	Environmental Studies	2	0	0	2
	Total	21	0	9	21
	SEMESTER V				
19113AEC51	Electricity and Magnetism	5	0	0	4
19113AEC52	Atomic Physics	4	1	0	3
19113AEC53	Basic Electronics	4	1	0	4
19113SEC54L	Electricity and Magnetism Lab	0	0	3	2
19113SEC55L	Basic Electronics Lab	0	0	3	2
19113DSC56	Discipline Specific Elective – I	5	0	0	3
19113BRC57	Participation in Bounded research	-	-	-	1
191__SEC05__	Skill based Elective- V	0	0	2	1
19111SEC05L	Communicative English Lab-V	0	0	1	1
	Total	18	2	9	21
	SEMESTER VI				
19113AEC61	Digital Electronics & Microprocessor	4	1	0	4
19113AEC62	Elements of Theoretical Physics	5	0	0	5
19113SEC63L	Digital Electronics Lab	0	0	3	2
19113SEC64L	Microprocessor Lab	0	0	3	2
19113DSC65	Discipline Specific Elective –II	5	0	0	3
191__OEC	Open Elective Course	4	0	0	2
19113PRW66	Project Work	-	-	-	4
191__SEC06__	Skill based Elective- VI	0	0	2	1
19111SEC06L	Communicative English Lab-VI	0	0	1	1
19113EXACT	Extension Activities	-	-	-	-
19113PEE	Programme Exit Examination	-	-	-	1
	Total	18	1	9	25
	Total Credits for the Programme				127

Discipline Specific Electives

Semester	Discipline Specific Elective Courses -I
V	a) 19113DSC55A- Digital Photography b) 19113DSC55B- Laser Physics

Semester	Discipline Specific Elective Courses - II
VI	a) 19113DSC64A-Material Physics b) 19113DSC64B- Numerical Methods and C Programming

General Electives

Semester	General Elective Courses
VI	e) 19110OEC-Tamil Ilakkiya Varalaru f) 19111OEC-Journalism g) 19112OEC-Development of Mathematical Skills h) 19114OEC-Food and Adulteration i) 19116OEC-Wildlife Conservation j) 19120OEC-E-Learning k) 19122OEC-Web Technology l) 19161OEC-Banking Service

Skill based Electives

Semester	Skill based Elective Courses
I	a) 19120SEC01AL-Package Lab - I b) 19160SEC01B-Soft skill - I
II	a) 19120SEC02AL-Package Lab - II b) 19160SEC02B-Soft skill - II
III	a) 19120SEC03AL-Package Lab - III b) 19160SEC03B-Soft skill - III
IV	a) 19120SEC04AL-Package Lab -IV b) 19160SEC04B- Soft skill - IV
V	a) 19120SEC05AL-Package Lab -V b) 19160SEC05B-Soft skill - V
VI	a) 19120SEC06AL-Package Lab -VI b) 19160SEC06B-Soft skill - VI

Credit Distribution

Sem	AEC	SEC	DSC	OEC	Research	NON CGP	Total
I	15	4	-	-	-	-	19
II	15	4	-	-	1	-	20
III	13	6	-	-	2	-	21
IV	13	6	-	-	-	2	21
V	11	6	3	-	1	-	21
VI	9	6	3	2	4	1	25
Total	76	32	6	2	8	3	127

M.Sc., PHYSICS
COURSE STRUCTURE

Course Code	Course Title	L	T	P	C
SEMESTER I					
19213AEC11	Advanced Mathematical Physics	6	1	0	5
19213AEC12	Classical and Statistical Mechanics	6	1	0	5
19213AEC13	Electronics and Communication	6	1	0	4
19213SEC14L	Spectroscopy and General Electronics Lab	0	0	4	2
19213DSC15_	Discipline Specific Elective – I	5	0	0	4
19213RLC16	Research Led seminar	-	-	-	1
	Total	23	3	4	21
SEMESTER II					
19213AEC21	Microprocessor and Microcontroller	5	1	0	5
19213AEC22	Quantum Mechanics	5	1	0	5
19213AEC23	Condensed Matter Physics	5	0	0	4
19213SEC24L	Advanced General Experiments Lab	0	0	4	2
19213DSC25_	Discipline Specific Elective – II	5	0	0	4
19213RMC26	Research Methodology	3	0	0	2
19213BRC27	Participation in Bounded Research	-	-	-	2
	Total	23	2	4	24
SEMESTER III					
19213AEC31	Electro Magnetic Theory	6	1	0	6
19213AEC32	Nuclear and Particle Physics	6	1	0	6
19213SEC33L	Advanced Electronics Lab	0	0	5	3
19213DSC34	Discipline Specific Elective – III	5	0	0	4
192_GEC35	General Elective	4	0	0	3
19213SRC36	Participation in Scaffold Research (Societal Project)	-	-	-	2
	Total	21	2	5	24
SEMESTER IV					
19213AEC41	Laser Physics And Non Linear Optics	6	1	0	6
19213AEC42	Numerical Methods and Computational Physics	6	1	0	6
19213SEC43L	Numerical Methods Lab with C++ Programming	0	0	5	3
19213DSC44_	Discipline Specific Elective – IV	5	0	0	4
19213PRW45	Project Work	0	0	0	6
19213PEE	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)19213DSC15A- Digital Communication b)19213DSC15B- Crystal Growth Processes
Semester	Discipline specific Elective Courses -II
II	a)19213 DSC25A- Atomic and Molecular Physics b)19213DSC25B- Materials Science
Semester	Discipline specific Elective Courses -III
III	a)19213 DSC34A- Photonics Devices and Applications b)19213 DSC34B- Analysis of Crystal Structures
Semester	Discipline specific Elective Courses -IV
IV	a)19213 DSC43A- Nano Science and Technology b)19213 DSC43B- Advanced Spectroscopy

General Electives

Semester	General Elective Courses
III	a) 19211GEC-Writing for the Media b) 19212GEC-Applicable Mathematics Techniques c) 19214GEC- Green Chemistry d) 19215GEC-Bio-analytical Techniques e) 19220GEC-Internet and Web Design f) 19261GEC- Insurance Services g) 19280GEC-Counselling Psychology

Credit Distribution:

S.No	Sem	AEC	SEC	DSC	OEC	Research	Others	Total
1.	I	14	2	4	-	1	-	21
2.	II	14	2	4	-	4	-	24
3.	III	12	3	4	3	2	-	24
4.	IV	12	3	4	-	6	2	27
Total		52	10	16	3	13	2	96

Course Code	
19113DSC65B	Numerical Methods and C Programming

NUMERICAL METHODS AND C PROGRAMMING	
Learning Objective: To understand the methods in numerical differentiation and integration and to develop the problem solving skills of the student. To introduce and explain the basic structure, rules of compiling and execution of C programming.	
UNITS	COURSE DETAILS
UNIT-I	NUMERICAL SOLUTIONS: determination of zeros of polynomials – roots of linear and nonlinear algebraic and transcendental equations – bisection and Newton-Raphson methods – convergence and divergence of solutions
UNIT-II	NUMERICAL DIFFERENTIATION, INTEGRATION AND CURVE FITTING: Newton's forward and backward interpolation – Lagrange's interpolation – Newton-Raphson method to find square root and cube roots – principle of least squares – fitting a straight line and exponential curve – trapezoidal rule – Simpson's 1/3 and 1/8 rule
UNIT-III	ALGORITHM, FLOW CHART AND PROGRAM: development of algorithm – flow chart for solving simple problems – average of set of numbers – greatest, smallest – conversion of Fahrenheit to Celsius and Celsius to Kelvin, miles to kilometer – sorting set of numbers in ascending and descending order – square matrix, addition, subtraction and multiplication of order (2x3) using arrays.
UNIT-IV	INTRODUCTION TO C: importance of C – basic structure of C programming – constants, variables and data types – character set, key words and identifiers – declaration of variables and data types – operators – expressions: arithmetic, relational, logical, assignment – increment and decrement – conditional – comma operators
UNIT-V	CONTROL STRUCTURE: decision making with if, if-else, nested if – switch – go to – break – continue – while, do while, for statements – arrays, one dimensional and two dimensional – declaring arrays – storing arrays in memory – initializing arrays – simple programs
TEXT BOOKS	<ol style="list-style-type: none"> 1. Numerical methods, Singaravelu, Meenakshipublication, 4th Edn., 1999. 2. Numerical methods P. Kandasamy, K. Thilagavathy, K. Gunavathi, S. Chand, 2016 3. Programming in C, Balagurusamy, TMG, ND, 2012 4. Numerical Analysis, M.K. Venkatraman, NPH, 2013

	5. Numerical Analysis, B.D.Gupta, Konark Publishers, New Delhi, 2013
REFERENCE BOOKS	1. Schaum's outline series, Theory and Problems of programming in C, C.Byron& S. Gottfried, Tata McGraw Hill 2003 2. Numerical methods and C Programming, Veerarajan, 2015.

Subject Code	Subject Name
19213DSC25B	MATERIALS SCIENCE

Pre-Requisites	
➤ Basic knowledge on different types of materials	
Learning Objectives	
➤ To gain knowledge on optoelectronic materials	
➤ To learn about ceramic processing and advanced ceramics	
➤ To understand the processing and applications of polymeric materials	
➤ To gain knowledge on the fabrication of composite materials	
➤ To learn about shape memory alloys, metallic glasses and nanomaterials	

UNITS	Course details
UNIT I: OPTOELECTRONIC MATERIALS	Importance of optical materials – properties: Band gap and lattice matching – optical absorption and emission – charge injection, quasi-Fermi levels and recombination – optical absorption, loss and gain. Optical processes in quantum structures: Inter-band and intra-band transitions Organic semiconductors. Light propagation in materials – Electro-optic effect and modulation, electro-absorption modulation – exciton quenching.
UNIT II CERAMIC MATERIALS	Ceramic processing: powder processing, milling and sintering – structural ceramics: zirconia, alumina, silicon carbide, tungsten carbide – electronic ceramics – refractories – glass and glass ceramics
UNIT III POLYMERIC MATERIALS	Polymers and copolymers – molecular weight measurement – synthesis: chain growth polymerization – polymerization techniques – glass transition temperature and its measurement – viscoelasticity – polymer processing techniques – applications: conducting polymers, biopolymers and high temperature polymers.
UNIT IV COMPOSITE MATERIALS	Particle reinforced composites – fiber reinforced composites – mechanical behavior – fabrication methods of polymer matrix composites and metal matrix composites – carbon/carbon composites: fabrication and applications.
UNIT V: NEW MATERIALS	Shape memory alloys: mechanisms of one-way and two-way shape memory effect, reverse transformation, thermo-elasticity and pseudo-elasticity, examples and applications -bulk metallic glass: criteria for glass formation and stability, examples and mechanical behavior - nanomaterials: classification, size effect on structural and functional properties, processing and properties of Nano crystalline materials.

single walled and multi walled carbon nanotubes

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. Jasprit Singh, Electronic and optoelectronic properties of semiconductor structures, Cambridge University Press, 2007 2. P. K. Mallick, Fiber-Reinforced Composites, CRC Press, 2008. 3. V. Raghavan, 2003, Materials Science and Engineering, 4th Edition, Prentice- Hall India, New Delhi(For units 2,3,4 and 5) 4. G.K. Narula, K.S. Narula and V.K. Gupta, 1988, Materials Science, Tata McGraw-Hill 5. M. Arumugam, 2002, Materials Science, 3rd revised Edition, Anuratha Agencies
REFERENCE BOOKS	<ol style="list-style-type: none"> 1. B. S. Murty, P. Shankar, B. Raj, B. B. Ruth and J. Murday, Textbook of Nanoscience and Nanotechnology, Springer- Verlag, 2012. 2. K. Yamachi, I. Ohkata, K. Tsuchiya and S. Miyazaki (Eds). Shape Memory and Super Elastic Alloys: Technologies and Applications. Wood head Publishing Limited, 2011. 3. Lawrence H. Van Vlack, 1998. Elements of Materials Science and Engineering, 6th Edition, Second ISE reprint, Addison-Wesley. 4. H. Ibach and H. Luth, 2002, Solid State Physics – An Introduction to Principles of Materials Science, 2nd Edition, Springer. 5. D. Hull & T. W. Clyne, An introduction to composite materials, Cambridge University Press, 2008.
WEB SOURCES	<ol style="list-style-type: none"> 1. https://onlinecourses.nptel.ac.in/noc20_mm02/preview 2. https://nptel.ac.in/courses/112104229 3. https://archive.nptel.ac.in/courses/113/105/113105081 4. https://nptel.ac.in/courses/113/105/113105025/ https://eng.libretexts.org/Bookshelves/Materials_Science/Supplemental_Modules_(Materials_Science)/Electronic_Properties/Lattice_Vibrations

Course Code	PHOTONICS DEVICES AND APPLICATIONS
19213DSC34A	

Aim:

- To learn the basic principles and working of lasers, basic processes and features of nonlinear optical materials and fiber optics.

UNIT – I: SOLID STATE LASERS

Solid state crystalline and glass Lasers – Advantages – Construction of the Ruby Laser – Mechanism of Excitation of the Ruby Laser – Neodymium Lasers – Nd-YAG Laser Nd-glass Laser – Alexandrite Laser – Fiber Glass Laser – Solid state Tunable Laser – Titanium Sapphire Laser – Colour center Lasers – DPSSL.

UNIT – II: LIQUID (DYE) AND LASERS

Geometry of Dye lasers – Pulsed Dye lasers pumped by Flash lamps – Tunable pulsed lasers pumped by other lasers – Tunable continuous Wave Dye lasers – Mode-locked Ring Dye lasers – Mechanism of Excitation of Mode – locked Ring Dye laser – Helium-neon Laser – Argon Ion Laser – Krypton Ion laser – Metal Vapour lasers – Carbon Dioxide Laser – Gas Dynamic Laser – Nitrogen Laser.

UNIT – III: CHEMICAL, X-RAY AND FREE ELECTRON LASERS

Hydrogen chloride laser – Hydrogen fluoride laser – X-ray lasers – Free Electron Lasers (FEL) – Characteristics of semiconductor lasers – Semiconductor diode lasers – Heterojunction semiconductor materials – Double Heterostructure Laser – Quantum – well Lasers – Higher power Semiconductor Diode Lasers – Single Mode Lasers – Multimode Lasers – Surface – Emitting Lasers (SELS).

UNIT – IV: Industrial Applications of Lasers (Material Processing)

High Power Gas Lasers – Material Processing with Lasers – Metals and Lasers Interactions – Materials Processing mechanism – Hole Drilling with Lasers – Cutting Process with Lasers – Laser Welding – The Welding Process – Micro Laser Welding – Deep Penetration Welding (High Power Laser Welding) – Laser Hardening – Marking with Lasers – Wire Striping With laser – Lasers in Nuclear Science – Isotope Separation – Lasers in Spectroscopy – Lasers in Chemistry – Light Detecting and Ranging (LIDAR).

UNIT – V: Laser Communication / Holography and Its Applications / Medical Science

Optical Sources for fiber optical communication – Photo (or photon) Detectors – Operation of Optical Receivers – Essential Characteristics of Laser in Fiber Optic Communication – Types of Holograms – Intensity Distribution in a Hologram – Fourier Hologram – Thick Hologram – Colour Holograms – Computer Holograms – Holographic Microscopy & Applications – Laser Diagnostics – Photo medicine – Lasers in Ophthalmology – Lasers for General Surgery – Lasers In Dermatology – Cardiology – Lasers In Dermatology – Cardiology – Lasers In Density – Lasers Used in Medicine.

Books for Study:

1. Koehner, W. Solid State laser engineering (Springer – Verlag, New York, 1992).
2. Svelto, O. Principles of Lasers (Plenum Press, New York, 1976).
3. Schafer F.P. Dye Lasers (Springer – Verlag, Berlin, 1973).
4. Rampal, V.V. Lasers and Applications (South Asian Publishers, New Delhi, 1993).
5. Silfvast, W.T. Laser Fundamentals (Cambridge University Press, 1993)
6. Elton, R.C. X-ray lasers (Academic press 1990).
7. Marshall T.C Free – Electron Lasers (Macmillan Publishing Company, New York, 1985).
8. Thomson, G.I.B. Physics of Semiconductor Devices (John Wiley & Sons, New York, 1980).
9. Sze, S.W. Semiconductor Devices, Physics and technology (John Wiley & Sons, New York, 1977).
10. Corzine, S.W., Yan R.H., Coldren and Zory, P. (Editors), Quantum well Lasers (Academic Press, Orlando, 1993).
11. Koebner, H. (Editors), Industrial Applications of lasers (John Wiley & Sons, New York, 1984).
12. Harry, J.E. Industrial Laser and their applications (McGraw Hill, London, 1974).
13. Keiser, G. optical fiber communication (McGraw Hill, 1991).
14. Demisyak and Yu, N. Fundamentals of Holography (Mir Publishers, Moscow, 1984)
15. Hochstrasser, R.M. and Johnson, C.K. "Lasers in Biology" (laser focus/electro-optics, 21, 1985).
16. Wolbarsst, M.L. "Laser application in Medicine and biology" Vol.1 (Plenum Press, New York, 1971).



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Department of Physics

Course Code	Course Title
19513PEL	Physics for Everyday Life

Total : 45 hours

Syllabus

PHYSICS FOR EVERYDAY LIFE	
Learning Objective: To know where all physics principles have been put to use in daily life and appreciate the concepts with a better understanding also to know about Indian scientists who have made significant contributions to Physics	
UNITS	COURSE DETAILS
UNIT-I	MECHANICAL OBJECTS: spring scales – bouncing balls –roller coasters – bicycles –rockets and space travel.
UNIT-II	OPTICAL INSTRUMENTS AND LASER: vision corrective lenses – polaroid glasses – UV protective glass – polaroid camera – colour photography – holography and laser.
UNIT-III	PHYSICS OF HOME APPLIANCES: bulb – fan – hair drier – television – air conditioners – microwave ovens – vacuum cleaners.
UNIT-IV	SOLAR ENERGY: Solar constant – General applications of solar energy – Solar water heaters – Solar Photo – voltaic cells – General applications of solar cells.
UNIT-V	INDIAN PHYSICISTS AND THEIR CONTRIBUTIONS: C.V.Raman, Homi Jehangir Bhabha, Vikram Sarabhai, Subrahmanyan Chandrasekhar, Venkatraman Ramakrishnan, Dr. APJ Abdul Kalam and their contribution to science and technology.
TEXT BOOKS	1. The Physics in our Daily Lives, Umme Ammara, Gugucool Publishing, Hyderabad, 2019. 2. For the love of physics, Walter Lawin, Free Press, New York, 2011.

Course outcomes:

At the end of the course, students will be able to:

1. apply physical principles of linear motion of different mechanical objects.
2. Understand the basic physics behind working of optical instruments and laser
3. Know about physics of home appliances
4. Gather knowledge regarding solar energy
5. Know about Indian physicists and their contributions



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Department of Physics

Subject Code	Subject Name
19513PV	Certificate course on Photovoltaics For Energy Conversion

Total : 45 hours

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 Yürücü, 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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Department of Physics

Course Code	Course Title
19513CP	Communication Physics

Total : 45 hours

Syllabus

Learning Objective:

To get a thorough knowledge on transmission and reception of radio waves, the different types of communication like fibre optic, radar, satellite, cellular

UNITS	COURSE DETAILS
UNIT-I	RADIO TRANSMISSION AND RECEPTION: transmitter – modulation types of modulation – amplitude modulation – limitations of amplitude modulation – frequency modulation – comparison of FM and AM – demodulation- essentials in demodulation – receivers: AM radio receivers – types of AM radio receivers – stages of superheterodyne radio receiver, advantages – FM receiver – difference between FM and AM receivers.
UNIT-II	FIBER OPTIC COMMUNICATION: introduction – basic principle of fiber optics – advantages – construction of optical fiber – classification based on the refractive index profile – classification based on the number of modes of propagation – losses in optical fibres – attenuation-advantages of fiberoptic communication
UNIT-III	RADAR COMMUNICATION: introduction - basic radar system – radar range – antenna scanning – pulsed radar system – search radar – tracking radar – moving target indicator Doppler effect-MTI principle – CW Doppler radar
UNIT-IV	SATELLITE COMMUNICATION: introduction history of satellites – satellite communication system – satellite orbits – basic components of satellite communication system – commonly used frequency in satellite – communication – multiple access communication – satellite communication in India
UNIT-V	MOBILE COMMUNICATION: introduction – concept of cell – basic cellular mobile radio system – cellphone – facsimile – important features of fax machine – application of facsimile – VSAT (very small aperture terminals) modem IPTV (internet protocol television) -Wi-Fi-4G (basic ideas)
TEXT BOOKS	1. V.K.Metha, Principles of Electronics, S. Chand and CoLtd., 2013

	2. Anokh Singh and Chopra A.K., Principles of communication Engineering, S.Chand and Co, 2013
REFERE NCE BOOKS	1. J.S. Chitode, Digital Communications, 2020, Unicorn publications 2. Senior John. M, Optical Fiber Communications: Principles and Practice, 2009, Pearson Education.

Course outcomes:

At the end of the course, students will be able to:

1. Get insights about transmission and reception of radio waves
2. Gather knowledge regarding the different types of communication like fibre optic, radar, satellite, cellular



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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 10.03.2019 at 10 a.m. in, PRIST Deemed to be University, Thanjavur under the Chairmanship of Dr. Bakrudeen Ali Ahamed (Chairperson, BOS)

The following members were present:

1. Dr. Bakrudeen Ali Ahamed, 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. Amushia, Associate Professor (Member, BOS)
6. Dr. A. Shajahan, Assistant Professor (Member, BOS)
7. Dr. G. Venatkumar, Assistant Professor (Member, BOS)
8. Dr. R. V. Shalini, Assistant Professor (Member, BOS)
9. Dr. P. Anantharaman, Professor, CAS in Marine Biology, Annamalai University (External Member, BOS)
10. Mr. Umar Ali Khan, Managing Director, Krind biotech Industry Trichy (External Member, BOS)
11. Ms. G. Karthika, Special Invitee Alumna, QC, NEEVA Food processing Centre, Chennai
12. Mr. R. Amulraj, B. Sc Biotechnology, PRIST Deemed to be University, Thanjavur

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
PRIST Deemed to be University
Thanjavur - 613 403, Tamilnadu.





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Department of Biotechnology




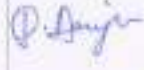
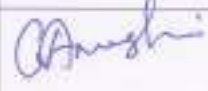

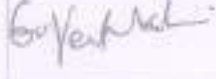


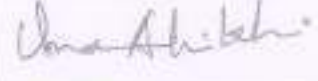


Composition of Board of Studies 2019-2020

S.No	Designation	Name	Qualification	Designation & Affiliation	Mail id
1	Chairperson/HoD	Dr. A. Bakrudeen Ali Abomed	M.Sc., Ph.D	Professor, Department of Biochemistry, PRIST Deemed to be University, Vallam, Thanjavur.	bakru24@gmail.com
2	External Expert-Academic	Dr. P. Anantharaman	M.Sc., Ph.D	Professor, CAS in Marine Biology, Annamalai University, Tamil Nadu, India	panantharaman@gmail.com
3	External Expert- Industry	Mr. Umar Ali Khan	M.Sc.	Managing Director, Krish Biotech Industry, Trichy	bd@krishbiotech.com
4	Professor	Dr. P. Manomani	M.Sc., Ph.D	Professor, Department of Biotechnology, PRIST Deemed to be University, Vallam, Thanjavur.	manomani@prist.ac.in
5	Associate Professor	Dr. C. Anusha	M.Sc., Ph.D	Associate Professor, Department of Biotechnology, PRIST Deemed to be University, Vallam, Thanjavur.	anusha@prist.ac.in
6	Associate Professor	Dr. Arjunpandian	M.Sc., Ph.D	Associate Professor, Department of Biotechnology, PRIST Deemed to be University, Vallam, Thanjavur.	arjunpandian@prist.ac.in
7	Assistant Professor	Dr. A. Shajahan	M.Sc., Ph.D	Assistant Professor, Department of Biotechnology, PRIST Deemed to be University, Vallam, Thanjavur.	shajahan@prist.ac.in
8	Assistant Professor	Dr. G. Venkatesh Kumar	M.Sc., Ph.D	Assistant Professor, PRIST Deemed to be University, Vallam, Thanjavur.	venkateshkumar@prist.ac.in
9	Assistant Professor	Dr. R. V. Shalini	M.Sc., Ph.D	Assistant Professor, PRIST Deemed to be University, Vallam, Thanjavur.	shalini@prist.ac.in
10	Special Invited-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 Invited- Alumnus/Alumna	Ms. G. Karthika	M.Sc	QC, NEEVA Food Processing Centre, Chennai	gkathika@gmail.com
12	Special Invited- Current student - UG or PG	Mr. R. Anuraj	B.Sc	Student	anuraj@prist.ac.in


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


Head of Arts & Science
PRIST Deemed to be University
Thanjavur - 613 003, Tamil Nadu

Signature of the Chairman & Members

1. Dr. Bakrudeen Ali Ahamed	
2. Dr. L. Chinnappa / Dean	 <small>Dean of Arts & Science PRISY Deemed to be University Bangalore - 561 013, Tumkur</small>
3. Dr. P. Manonmani	
4. Dr. Arjun Pandian	
5. Dr. C. Anushia	
6. Dr. A. Shajahan	
7. Dr. G. Venkatkumar	
8. Dr. R. V. Shafiq	
9. Dr. P. Anantharaman	
10. Mr. Umar Ali Khan	
11. Ms. G. Karthika	
12. Mr. R. Amulraj	

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 B.Sc Biotechnology & M.Sc Biotechnology in detail and revised the course credit system for both UG and PG Biotechnology and also made the necessary changes in upcoming B.Sc Biotechnology & M.Sc Biotechnology as mentioned below.

REVIEW OF CURRICULUM & SYLLABUS IN B.Sc Biotechnology

REGULATION 2019

B.Sc Biotechnology

The following changes have been made in upcoming with respect to existing curriculum.

Curriculum credits: 127

Change of course content for the following Courses in B.Sc Biotechnology

Course content for the following subjects can be modified / upgraded

1. Cell biology and genetics (19117AEC23)
2. Immunology Lab (19117AEC36L)
3. Research Methodology (19117RMC37)
4. Animal Physiology Lab(19117AEC44L)
5. Plant and animal Biotechnology (19117AEC61)
6. rDNA Technology (19117DSC56A)

Introduction of employability, entrepreneur and skill development (Assured Course)

1. Immunology Lab- Entrepreneur
2. Plant and animal Biotechnology- Entrepreneur
3. rDNA Technology- employability

Introduction of value added courses

1. Certificate course on Biomedical Instrumentation
2. Certificate Course on Cell Culture Techniques
3. Certificate Course on Tools in Biostatistics

REVIEW OF CURRICULUM & SYLLABUS IN M.Sc Biotechnology

The following changes have been made in upcoming with respect to existing curriculum.

Agenda: Revision of the existing Curriculum based on NAAC guidelines

It is decided to revise the syllabus of B.Sc. & M.Sc. Biotechnology program by incorporating the following aspects.

1. Specific mentioning should be made in the curriculum with regards to:

- Program outcomes
- Program specific outcomes
- Course objectives
- Course outcomes (Annexure 1)

2. Develop curriculum with relevance to

- Local needs
- Regional needs
- National needs
- Global needs

3. Develop existing course with focus on:

- Employability
- Entrepreneurship
- Skill development (Annexure 2)

4. Develop existing course with focus on:

- Gender
- Environment and sustainability
- Human values and professional ethics (Annexure 3)

5. Introduce field trip, research projects and internships at the end of each academic year

6. Research collaborations with research institutes to facilitate the course and signing of MOU's with them

Members started reviewing the syllabus of each course extensively. The following changes were proposed.

The meeting adopts the following resolutions:

- Define and include Program outcome/ course objectives and course outcomes in the syllabus
 - Divide or restructure the syllabus for an hour or a suitable time frame
 - Enrich the syllabus with relevant topics and avoiding repetitions
- BOS has approved the induction of G. KARTHIKA as the alumni representative

To consider and approve the curriculum and syllabus for UG and PG biotechnology

The chairman informed the house that the department teams have been working on the revision of curricula and in this direction one seminar was conducted on 9.01.2019 wherein experts from Industry and academia were invited to discuss the proposed curriculum.

The members considered the revised curriculum and discussed different issues. It was pointed out that the number of Credits for each subject should be added in the detailed syllabus of every subject. (Annexure IV)

The members approved the curricula for consideration of faculty of Biotechnology. The matter regarding the implementation of a scheme from academic year 2019-2020 was also discussed and it was decided that the new scheme can be implemented from BSc II-VI semester and MSC II-IV semester with effect from the Academic year 2019 by taking into consideration stakeholder feedback on curricula.

The Committee emphasized the need for contemporary topics which can enhance the Biotechnological skills of students and insisted that the topics should connect with the students.

The Committee suggested and incorporated the following changes

The following changes have been recommended by the committee with regard to Biotechnology (B.Sc I year II semester)

- The course code Cell biology and genetics /17117AEC23 have been changed into Cell biology and genetics /19117AEC23 (The entire syllabus content has been changed)
1. Genetics- History, genetics in society and biology, fundamental concept of genetics- Mendelian genetics: Monohybrid cross, dihybridcross, testcross, backcross, Sex – linked chromosomes, genetic Vs environmental effect-multiple alleles. Deviations from Mendelian genetic principles new topics have been introduced in Unit I.
 2. Prokaryotic and eukaryotic chromosomes-organization and structure-transposable elements, cellular reproduction in prokaryotic and eukaryotic cells-significance-cell cycle-linkage, mechanism of crossing over- genetic variability new topics have been introduced in UNIT II.
 3. Gene concept: modern concept of gene- DNA as a genetic material- Watson and Crick model of DNA- DNA replication- repair- telomeres – linkage-recombination-gene mapping-DNA senescence new topics have been introduced in Unit III.
 4. Prokaryotic and eukaryotic transcription and translation-RNA and its types-genetic code. Control of Gene expression: operon concept- lac and trp operon new topics have been introduced in Unit IV.
 5. Gene mutation and chromosome variations-genetic disorders- in borne errors of metabolism, banding techniques, chromosomal aberrations. Cell junctions and the

extracellular matrix-cell-cell junctions-the extracellular matrix cancer and oncogenes new topics have been introduced in Unit V. (Annexure V)

The following changes have been recommended by the committee with regard to Biotechnology (BSc II year III semester)

"Immunology lab/ 17117AEC36L" Syllabus content is modified and new course code "19115AEC33" is implemented. All Exercise was changed

1. To determine total platelet count
2. To perform PT
3. To perform APTT
4. To perform thrombin time
5. Determination of hemoglobin by various methods.
6. Determination of Total RBC count. (Annexure V)

The following changes have been recommended by the committee with regard to Biotechnology (BSc II year III semester)

"Research methodology/ 171PHSRM37" Syllabus content is modified and new course code "19117RMC37" is implemented and Unit V content was changed. (Annexure V)

The following changes have been recommended by the committee with regard to Biotechnology (B.Sc III year V semester)

rDNA Technology/ 17117DSC56A Syllabus content is modified and new course code "19117DSC56A" is implemented.

1. Gene cloning: principle and strategies- vectors- general characters-types- replication- plasmids- phage vectors- cosmids- plant and animal vectors- Restriction endonucleases and ligases new topics have been introduced in Unit I.
2. Gene Transfer methods-transformation-artificial methods of gene transfer- physical, chemical and biological methods- electroporation, biolistic, microinjection – liposome mediated gene transfer new topics have been introduced in Unit II.
3. Genetic transformation of prokaryotes- introduction of DNA into living cell- identification of recombination- introduction of phage DNA into bacterial cells
4. Cloning vectors for higher plants and animals- cloning DNA sequence that encode eukaryotic proteins new topics have been introduced in Unit III.
5. Construction of genomic DNA libraries and cDNA library-probes-types and construction- screening a library-labeling of probes-applications of probe. Cloning in E.coli and yeast. Concept of PCR-applications-PCR variants- analysis of amplified product-cDNAs, gene synthesis by PCR new topics have been introduced in Unit IV.

6. Applications of rDNA technology in medicine, agriculture and industry. Safety aspects of rDNA technology. production of protein from cloned genes, production of recombinant protein by eukaryotic cells- animal and plant cell new topics have been introduced in Unit V. (Annexure V)

The following changes have been recommended by the committee with regard to Biotechnology (B.Sc III year VI semester)

"Plant and Animal Biotechnology" / 17117AEC61" Syllabus content was modified and new course code "19117AEC61" is implemented.

1. Plant genome organization - Nucleus, Chloroplast genome and mitochondrial genome, cytoplasmic male sterility. Regulation of gene expression in plant development. plant-microbes-associated insect vectors and disease new topics have been introduced in Unit I
2. Agrobacterium and crown gall tumor, Ti and Ri plasmids, T-DNA, binary vectors, 35S and other promoters, use of reporter genes and marker genes, gene transfer methods in plants. Direct and indirect DNA transfer. Manipulation of genes regulatory sequences in plants new topics have been introduced in Unit II.
3. Genetic engineering in plants. Pest transformation technique, pest and disease resistant plants. Benefits and transgenic technology, application of plant biotechnology for improved crop quality and productivity. Genetically engineered microorganisms- genetically modified crops new topics have been introduced in Unit III.
4. Genetic engineering in animals: transformation of animal cells- vectors for animal cells-gene therapy-DNA fingerprinting in forensic science. In vitro fertilization and embryo transfer- transgenic animal production- xenograft new topics have been introduced in Unit IV.
5. Applications of biotechnology techniques- animal models, upstream and downstream process technology, molecular biotechnology for diagnostics techniques in identification and characterization-current scenario of molecular diagnosis in various disease. Animal health and welfare new topics have been introduced in Unit V. (Annexure V)

The following changes have been recommended by the committee with regard to Biotechnology (M.Sc II year III semester)

- In III Semester "Recombinant DNA Technology / 17217SEC31" has to be syllabus changed the new course "Genomics/ 19217AEC31" is implemented.

- In III Semester "Plant Biotechnology/ 17217SEC32" has to be syllabus changed the new course "Proteomics/ 19217AEC32" is implemented. **(Annexure VII)**

The following changes have been recommended by the committee with regard to Biotechnology (M.Sc II year IV semester)

- Food Technology/ 19217AEC41 new syllabus have been introduced.
- Bio instrumentation/ 19217AEC42 new syllabus have been introduced.
- Food technology and Bio instrumentation lab/ 19217SEC43L new syllabus have been introduced. **(Annexure VII)**

The Committee suggested and incorporated the following changes

Curriculum credits: 96

Inclusion of new Courses

- Genomics (19217AEC31)
- Proteomics (19217AEC32)
- Genomics & Proteomics - Lab (19217SEC33L)
- Food Technology-(19217AEC41)
- Bio instrumentation-(19217AEC42)
- Food technology and Bio instrumentation lab-(19217SEC43L)

Introduction of employability, entrepreneur and skill development (Assured Course)

1. Genomics (19217AEC31) – Entrepreneur
2. Proteomics (19217AEC32) – Skill development
3. Food Technology (19217AEC41)– Entrepreneur
4. Bio instrumentation (19217AEC42) - Employability
5. Food technology and Bio instrumentation lab (19217SEC43L)– Employability

Introduction of new additional Elective Courses

1. Gene therapy utilization pharmacology (19217 DSC44A)
2. Plant conservation & disaster management (19217 DSC44B)

Members of the Board updated the panel of examiners and submitted the same to the Academic Counsel for its approval.

- Annexure I - Programme outcome
- Annexure II - Employability
- Annexure III - human value
- Annexure IV - Revised Curriculum structure Credits
- Annexure V - Revised Curriculum structure and Syllabus of UG.
- Annexure VI - Revised curriculum structure and syllabus of Add on course
- Annexure VII - Revised Curriculum structure and Syllabus of PG.
- Annexure VIII- List of Members.



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SCHOOL OF ARTS AND SCIENCE

B. Sc., BIOTECHNOLOGY REGULATION- 2019

COURSE STRUCTURE

Course Code	Course Title	L	T	P	C
SEMESTER I					
19110AEC11/ 19111AEC11/ 19132AEC11/ 19135AEC11	Language-I (Tamil-I/ Advanced English-I/ Hindi-I/ French-I)	4	0	0	2
19111AEC12	English-I	4	0	0	2
19117AEC13	Fundamentals of Biological System	6	0	0	4
19117AEC14L	Fundamentals of Biological System Lab	0	0	3	2
19115AEC15A	Biological Chemistry	6	1	0	5
19115AEC16AL	Biological Chemistry Lab	0	0	3	2
191 SEC01	Skill Based Elective-I	0	0	2	1
19111SEC01L	Communicative English Lab-I	0	0	1	1
191INDCONS	Indian Constitution	-	-	-	-
	Total	20	1	9	19
SEMESTER II					
19110AEC21/ 19111AEC21/ 19132AEC21/ 19135AEC21	Language-II (Tamil-II/ Advanced English-II / Hindi-II/ French-II)	4	0	0	2
19111AEC22	English-II	4	0	0	2
19117AEC23	Cell Biology and Genetics	6	1	0	4
19117AEC24L	Cell Biology and Genetics Lab	0	0	3	2
19116AEC25	Microbiology	6	0	0	5
19116AEC26L	Microbiology Lab	0	0	3	2
19117RLC27	Research LED Seminar	-	-	-	1
191 SEC02	Skill Based Elective -II	0	0	2	1
19111SEC02L	Communicative English Lab-II	0	0	1	1
	Total	20	1	09	20
SEMESTER III					

19110AEC31/ 19111AEC31/ 19132AEC31/ 19135AEC31	Language-III (Tamil-III/ Advanced English-III / Hindi-III/ French-III)	4	0	0	2
19111AEC32	English-III				
19117AEC33	Plant Physiology	4	0	0	2
19117AEC34L	Plant Physiology Lab	5	0	0	4
19117AEC35	Immunology	0	0	3	2
19117AEC36L	Immunology Lab	5	1	0	5
19117RMC37	Research Methodology	0	0	3	2
191 SEC03	Skill based Elective- III	2	0	0	2
19111SEC03L	Communicative English Lab-III	0	0	2	1
	Total	0	0	1	1
	Total	20	1	09	21
	SEMESTER IV				
19110AEC41/ 19111AEC41/ 19132AEC41/ 19135AEC41	Language-IV (Tamil-IV/ Advanced English-IV/ Hindi-IV/ French-IV)	4	0	0	2
19111AEC42	English-IV				
19117AEC43	Animal Physiology	4	0	0	2
19117AEC44L	Animal Physiology Lab	5	0	0	4
19117AEC45	Bioinformatics and Biostatistics	0	0	3	2
19117AEC46L	Bioinformatics and Biostatistics Lab	6	0	0	5
191 SEC04	Skill based Elective- IV	0	0	3	2
19111SEC04L	Communicative English Lab-IV	0	0	2	1
191ENVSTU	Environmental Studies	0	0	1	1
	Total	2	0	0	2
	Total	21	0	9	21
	SEMESTER V				
19117AEC51	Development Biology	5	0	0	4
19117SEC52	Cell and Tissue Culture	5	0	0	3
19117AEC53	Enzyme and Enzyme Technology	4	1	0	4
19117AEC54L	Development Biology, Tissue Culture Lab	0	0	3	2
19117AEC55L	Enzyme and Enzyme Technology Lab	0	0	3	2
19117DSC56	Discipline Specific Elective -I	5	0	0	3
19117BRC57	Participation in Bounded Research	-	-	-	1
191 SEC05	Skill Based Elective -V	0	0	2	1
19111SEC05L	Communicative English Lab - V	0	0	1	1

	Total	19	1	9	21
	SEMESTER VI				
19117AEC61	Plant and animal Biotechnology	5	0	0	4
19117SEC62	Applied Biotechnology	5	0	0	5
19117SEC63L	Plant, Animal and Applied Biotechnology Lab	0	0	3	2
19117AEC64L	Environmental Biotechnology Lab	0	0	3	2
19117DSC65_	Discipline Specific Elective - II	5	0	0	3
191__OEC_	Open Elective	4	0	0	2
19117PRW67	Project Work	-	-	-	4
191__SEC06_	Skill Based Elective -VI	0	0	2	1
19111SEC06L	Communicative English Lab-VI	0	0	1	1
19117EXACT	Extension Activities	-	-	-	-
19117PEE	Programme Exit Examination	-	-	-	1
	Total	19	0	9	25
	Total Credits for the Programme				127

Discipline Specific Electives

Semester	Discipline Specific Elective Courses-I
V	a) 19117DSC56A - Biotechnology b) 19117DSC56B - Molecular Biology
	Discipline Specific Elective Courses-II
VI	a) 19117DSC65A - Environmental Biotechnology b) 19117DSC65B - Environmental Management

Open Electives

Semester	Open Elective Courses
VI	a) 19110OEC-Tamil Ilakiya varalaru b) 19111OEC-Journalism c) 19112OEC-Development of Mathematical Skills d) 19113OEC-Instrumentation e) 19114OEC-Food and Adulteration f) 19120OEC-E-Learning g) 19122OEC-Web Technology h) 19161OEC-Banking services

Skill based Electives

Semester	Skill based Elective Courses
I	a) 19120SEC01AL-Package Lab – I b) 19160SEC01B-Soft skill – I
II	a) 19120SEC02AL-Package Lab – II b) 19160SEC02B-Soft skill – II
III	a) 19120SEC03AL-Package Lab – III b) 19160SEC03B-Soft skill – III
IV	a) 19120SEC04AL-Package Lab – IV b) 19160SEC04B- Soft skill – IV
V	a) 19120SEC05AL-Package Lab – V b) 19160SEC05B-Soft skill - V
VI	a) 19120SEC06AL-Package Lab – VI b) 19160SEC06B-Soft skill – VI

Credit Distribution

Sem	AEC	SEC	DSC	GEC	Research	Others	Total
I	17	2	-	-	-	-	19
II	17	2	-	-	1	-	20
III	17	2	-	-	2	-	21
IV	17	2	-	-	-	2	21
V	12	5	3	-	1	-	21
VI	06	9	3	2	4	1	25
Total	86	22	6	2	08	3	127


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SCHOOL ARSDTS AND SCIENCE

DEPARTMENT OF BIOTECHNOLOGY

M.Se., BIOTECHNOLOGY- REGULATION 2019

COURSE STRUCTURE

Course Code	Course Title	L	T	P	C
SEMESTER I					
19217AEC11	General Microbiology	6	1	0	5
19217AEC12	Molecular Genetics	6	1	0	5
19217AEC13	Biochemistry	6	1	0	4
19217SEC14L	Microbiology & Molecular Genetics - Lab	0	0	4	2
19217DSC15	Discipline Specific Elective I	5	0	0	4
19217RLC16	Research Led Seminar	-	-	-	1
	Total	23	3	4	21
SEMESTER II					
19217AEC21	Cell & Molecular Biology	5	1	0	5
19217AEC22	Biophysics & Bioinformatics	5	1	0	5
19217AEC23	Industrial Biotechnology	5	0	0	4
19217SEC24L	Molecular Biology & Industrial Biotechnology - Lab	0	0	4	2
19217DSC25	Discipline Specific Elective II	5	0	0	4
19217RMC26	Research Methodology	3	0	0	2
19217RRC27	Participation in Bounded Research	-	-	-	2
	Total	23	2	4	24
SEMESTER III					
19217AEC31	Genetics	6	1	0	6
19217AEC32	Proteomics	6	1	0	6
19217SEC33L	Genomic and Proteomics - Lab	0	0	5	3
19217DSC34	Discipline Specific Elective III	5	0	0	4
192 OEC	Open Elective	4	0	0	3
19217SRC35	Design Socio technical research	-	-	-	2
	Total	21	2	5	24
SEMESTER IV					
19217AEC41	Food technology	6	1	0	6
19217AEC42	Bio instrumentation	6	1	0	6
19217SEC43L	Food Technology and Bio instrumentation lab	0	0	5	3
19217DSC44	Discipline Specific Elective IV	5	0	0	4

19217PRW45	Project work	-	-	-	6
19217PEE	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)19217DSC15A- Immunology b)19217DSC15B- Biosafety and biodiversity
	Discipline specific Elective Courses-II
II	a)19217 DSC25A- Endocrinology b)19217 DSC25B- Bioethics and IPR
	Discipline specific Elective Courses-III
III	a)19217 DSC34A- Nanobiotechnology b)19217 DSC34B- Environmental biotechnology
	Discipline specific Elective Courses-IV
IV	a)19217 DSC44A- Gene therapy utilization pharmacology b)19217 DSC44B- Plant conservation & disaster management

Open Electives

Semester	Open Elective Courses
III	a) 19211OEC- Writing for the media b) 19212OEC-Applicable Mathematics Techniques c) 19213OEC-Bio-medical Instrumentation d) 19214OEC-Green Chemistry e) 19220OEC-M-Marketing f) 19261OEC- Insurance services g) 19280OEC-Counselling Psychology

Credit Distribution:

S.No	Sem	AEC	SEC	DSC	OEC	RSB	Others	Total
1.	I	14	2	4	-	1	-	21
2.	II	14	2	4	-	4	-	24
3.	III	12	3	4	3	2	-	24
4.	IV	12	3	4	-	6	2	27
Total		52	10	16	3	13	2	96


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Programme outcomes (POs), Programme Specific Outcomes (PSOs) and Course Outcomes(COs) of the Programmes offered by the University (19UGBTGE)

Program Outcomes and Course outcomes of

Department of Biotechnology

REGULATION – 2019



DEPARTMENT OF BIOTECHNOLOGY

B. Sc - BIOTECHNOLOGY
19UGBTGEC

REGULATION 2019

Programme offered:

S. No	Programme Name	PO and CO
1.	B. Sc Biotechnology	Yes
2.	M. Sc Biotechnology	Yes
3.	M. Phil Biotechnology	Yes

PROGRAMME OUTCOMES	
PO1	Understand the basic concepts, fundamental principles, and the scientific theories related to various scientific phenomena and their relevancies in the day-to-day life
PO2	Understanding and better knowledge of the causes, types and control methods for environmental pollution by the students
PO3	The student will be able to discuss the mechanisms associated with gene expression system in prokaryotes and eukaryotes
PO4	Developed various communication skills such as reading, listening, speaking, etc.,
PO5	Acquired the skills in handling scientific instruments, planning and performing in laboratory experiments
PO6	Ethics: Convey and practice social, environmental and biological ethics
PO7	To get knowledge about research tools and learn to do review literature. Ability to carry out independent literature survey corresponding to the specific publications type and assess basic research tool
PROGRAM SPECIFIC OUTCOME	
PSO1	Graduates will exhibit contemporary knowledge in Biotechnology and students will be eligible for doing jobs in pharmaceutical and biotechnological industry.
PSO2	An expert in biotechnology and allied fields (medical, microbial, Agricultural, environmental, plant and animal) for utilizing the practical skill to address biotechnological challenges.
PSO3	Graduates will be able to work individually as well as in team to survive in multidisciplinary environment.
PSO4	If students will engage themselves in the process of effective learning, it will give opportunities to utilize acquired knowledge for the catering the needs of science and technology as well as for the betterment of human mankind.
PSO5	Graduates will be able to understand the potentials, and impact of biotechnological innovations on environment and their implementation for finding sustainable solution to issues pertaining to environment, health sector, agriculture, etc.
PROGRAM EDUCATIONAL OBJECTIVES	
PEO1	To obtain detailed information about the fundamentals of Biotechnology, allied subjects and life skills
PEO2	To provide information about the molecular methods which involved in cellular processes of living systems such as microbes to higher order organisms for applied aspects. To address the emerging need for skilled scientific manpower with research ethics involving organisms
PEO3	To impart the basics and current molecular tools in the areas of Molecular Diagnostics, Fermentation Technology, Plant, Animal & Environmental Biotechnology are included to

	train the students for man power development and also sensitize them to scope for research. The practical subjects will provide information about the careers in the industry and applied research where biological system is employed
PEO4	To make the graduates of Biotechnology to learn and to adopt in a competitive world of technology update and contribute to all forms of life
PEO5	To enable them to execute a research objective through experimentation

POs/PEO	PO1	PO2	PO3	PO4	PO5
PEO1	*	*		*	
PEO2			*	*	*
PEO3		*		*	
PEO4	*	*			*
PEO5			*		

Semester	Course Code	Title of the Course	Coa
I	19110AEC11	Language-I (Tamil-I)	CO1 - Learn the changes that have occurred in literature since the classical period. CO2 - Make use of vocabulary systematically. CO3 - Understand how to lead one's life realizing the modernity and its environment/atmosphere.
I	19111AEC11	Advanced English-I	CO1 - Develop vocabulary CO2 - Learn to edit and do proof reading CO3 - Read and comprehend literature
I	19111AEC12	English-I	CO1 - Read and comprehend literature CO2 - Appreciate poetry and prose CO3 - Familiarize students with fiction.
I	19117AEC13	Fundamentals of Biological system	CO1 - Understand the physical, chemical, and mathematical basis of biology CO2 - Appreciate the different scales of biological systems CO3 - To understand the Basics in life sciences, evolution and organization of life, living and non-living things CO4 - To understand the basics of biomolecules, carbohydrates, proteins, lipids and Nucleic acids
I	19117AEC15L	Fundamentals of Biological system Lab	CO1 - The learners will acquire knowledge on the structure and functions relationship of biological system and as well their roll in various biological process CO2 - To know the cellular organization of life, cell theory- cell organization- cell organelles- plant and animal cell

			CO3 - To understanding the basic fundamentals of Biological System
I	19115AEC15A	Biological Chemistry	CO1 - The learners will acquire knowledge on the structure and functions relationship of proteins nucleic acid carbohydrates and as well their roll in various biological process
			CO2 - They study the influence and role of structure in reactivity of biomolecules
			CO3 - Through this course the students are exposed to importance of biological macromolecules
I	19115AEC16AL	Biological Chemistry Lab	CO1 - Students will use current biochemical and molecular techniques to plan and carry out experiments,
			CO2 - Biochemistry Majors will gain proficiency in basic laboratory techniques in both chemistry and biology, and be able to apply the scientific method to the processes of experimentation and hypothesis testing
			CO3 - At the end of the course, the students have a thorough understanding on the role of biomolecules and their functions
I	19120SEC01A	Skill Based Elective-I	CO1 - Recognize when to use each of the Microsoft Office programs to create professional and academic documents.
			CO2 - Use Microsoft Office programs to create personal, academic and business documents following current professional and/or industry standards.
			CO3 - Apply skills and concepts for basic use of computer hardware, software, networks, and the Internet in the workplace and in future coursework as identified by the institutionally accepted Internet and Computing Core (IC3) standards.
I	19111SEC01L	Communicative English Lab-I	CO1 - Learn grammar.
			CO2 - Enrich vocabulary
			CO3 - Understand the process of communication
			CO4 - Develop listening skill
I	191INDCONS	Indian Constitution	CO1 - Democratic values and citizenship Training and gained
			CO2 - Awareness on fundamental Rights are established
			CO3 - The functions of union Government and State Government are learnt
			CO4 - The Power and functions of the Judiciary learnt thoroughly
			CO5 - Appreciation of Democratic Parliamentary Rule is learnt
II	19110AEC21	Language-II (Tamil-II)	CO1 - Know what devotion really is.
			CO2 - Know the fruitfulness obtained through devotion
			CO3 - Perceive the progress achieved in the society through devotion.
II	19111AEC21	Advanced English-II	CO1- Develop technological skills.
			CO2 - Able to write in a variety of formats
			CO3 - Read biographies and develop personality

II	19111AEC22	English-II	CO1 - Appreciate different forms of literature
			CO2 - Acquire language skills through literature
			CO3 - Broadens the horizon of knowledge
II	19117AEC23	Cell Biology and Genetics	CO1 - This paper will enable the students to learn the basics and lay strong foundation in understanding the composition of cells, how cells works is fundamental to living systems.
			CO2 - The course outcome is to train the students in understanding genetics and relate modern DNA technology for disease diagnostics and therapy
			CO3 - Students will be taught Mendelian genetics, their principles and gene interaction.
			CO4 - This gives them a strong foundation on the basic unit of life.
II	19117AEC24L	Cell Biology and Genetics lab	CO1 - Able to isolate the DNA, identify and distinguish different blood cells, to solve simple genetic problems and analyze Human karyotype
			CO2 - The course teaches the students about genes at molecular level
			CO3 - They learn about DNA, RNA and their replication, mutations, DNA repair mechanism
II	19116AEC25	Microbiology	CO1 - This fundamental paper discusses the importance of microorganisms
			CO2 - The course throws light on types of microorganisms in and around humans
			CO3 - At the end of the course, the student has understanding on the metabolism and mechanism of microbial life
			CO4 - Gain knowledge about metabolism.
II	19116AEC26L	Microbiology lab	CO1 - Develop basic skill in aseptic techniques
			CO2 - Understand various accessories for microbiology practicals
			CO3 - Perform various staining techniques
			CO4 - Cultivate bacteria with different cultivation technique
II	19117RLC27	Research LED Seminar	CO1 - Exposure to various research domains
			CO2 - Acquaintance with languages of research
			CO3 - Development of research aptitude
II	19120SEC02A	Skill Based Elective -II	CO1 - Identify the names and functions of the PowerPoint interface.
			CO2 - Create, edit, save, and print presentations.
			CO3 - Format presentations.

			CO4 - Add a graphic to a presentation.
			CO5 - Create and manipulate a simple slideshow with outlines and notes.
			CO6 - Create slide presentations that include text, graphics, animation, and transitions.
II	19111SEC02L	Communicative English Lab-II	CO1 - Learn grammar.
			CO2 - Use a variety of reading strategies
			CO3 - Enhance the skill of making grammatically correct sentences.
III	19110AEC31	Language-III (Tamil-III)	CO1 - Achieve one's goal by following the ancestral path
			CO2 - Learn to lead life of perfection by realizing the uncertainty in the life
			CO3 - Attain happiness through honesty
III	19111AEC31	Advanced English-III	CO1 - Understand phonetics.
			CO2 - Develop writing skill
			CO3 - Able to develop creative writing
III	19111AEC32	English-III	CO1 - Enable to appreciate different types of prose
			CO2 - Develop the conversational skills through one-act plays
			CO3 - Enhance the skill of making grammatically correct sentences.
III	19117AEC33	Plant Physiology	CO1 - Impart an insight into the various plant water relations
			CO2 - Learning about the mineral nutrition in plants
			CO3 - Understand the mechanism of various metabolic processes in plants
			CO4 - Understand the respiration in higher plants with particular emphasis on aerobic and anaerobic respiration.
III	19117AEC34L	Plant physiology Lab	CO1 - Equip students with skills and techniques related to plant physiology so that they can design their own experiments
			CO2 - Learn about the movement of sap and absorption of water in plant body.
			CO3 - Understand the plant movements
III	19117AEC35	Immunology	CO1 - The students may understanding the immune system, its components and various techniques used in bio manipulation.
			CO2 - This course gives an overview on the immune system including organs, cells and receptors
			CO3 - The students learns about molecular basis of antigen recognition, hypersensitivity reaction, antigen-antibody reactions
			CO4 - The course develops in the student an appreciation for principles of immunology and its applications in treating human diseases

III	19117AEC36L	Immunology Lab	CO1 - Identify the structure, function, and characteristics of immunoglobulins.
			CO2 - Explain the principles of and perform serological tests.
			CO3 - It's a paper which accomplishes the learning of techniques involved in understanding the immunological aspects of physiology and biological samples
III	19117RMC37	Research Methodology	CO1 - Understanding research questions and tools
			CO2 - Experience in scientific writings
			CO3 - Practice in various aspects of scientific publications
			CO4 - Inculcation of research ethics
III	19120SEC03A	Skill based Elective- III	CO1 - Indicate the names and functions of the Excel interface components.
			CO2 - Enter and edit data.
			CO3 - Format data and cells.
			Construct formulas, including the use of built-in functions, and relative and absolute references.
			CO2 - Create and modify charts.
III	19111SEC03L	Communicative English Lab-III	CO1 - Learn grammar.
			CO2 - Enhance their fluency in English
			CO3 - Develop speaking and writing skills
			CO4 - Develop individual perspectives that demonstrate critical thinking skills
IV	19110AEC41	Language-IV (Tamil-IV)	CO1 - Realize how the ancient people changed their lifestyle according to the ages
			CO2 - Learn how to change one's lifestyle according to the needs of the future
			CO3 - Accept the modern trends and its uses
IV	19111AEC41	Advanced English-IV	CO1 - Develop writing skill.
			CO2 - Comprehend and describe poems
			CO3 - Learn interviewing skills
IV	19111AEC42	English-IV	CO1 - Improve their ability to read and understand them
			CO2 - Know the genius of Shakespeare
			CO3 - Express in writing their views.

IV	19117AEC43	Animal physiology	<p>CO1 - To provide advanced undergraduate and introductory graduate students with a comprehensive overview of animal physiology from molecular, cellular and whole animal systems approaches.</p> <p>CO2 - To critically evaluate clinical and research case problems relating to endocrinology and cell biology.</p>
IV	19117AEC44L	Animal Physiology Lab	<p>CO1 - Have an enhanced knowledge and appreciation of mammalian physiology</p> <p>CO2 - Understand the functions of important physiological systems including the cardiorespiratory, renal, reproductive and metabolic systems</p> <p>CO3 - It trains the students with essentiality of molecules, cells, tissues and organs involved in the defense mechanism</p>
IV	19117AEC45	Bioinformatics and biostatistics	<p>CO1 - Know the applications and limitations of different bioinformatics and statistical methods.</p> <p>CO2 - Be able to perform and interpret bioinformatics and statistical analyses with real molecular biology data.</p> <p>CO3 - Be able to describe statistical methods and probability distributions relevant for molecular biology data.</p>
IV	19117AEC46L	Bioinformatics and Biostatistics Lab	<p>CO1 - This laboratory course will prepare the students for various applications of bioinformatics in life science research.</p> <p>CO2 - The student will be able to apply basic principles of biology, computer science and mathematics to address complex biological problems.</p> <p>CO3 - This course imparts the knowledge of basic statistical methods to solve problems.</p>
IV	19120SEC04A	Skill based Elective- IV	<p>CO1 - Examine database concepts and explore the Microsoft Office Access environment.</p> <p>CO2 - Design a simple database.</p> <p>CO3 - Build a new database with related tables.</p> <p>CO4 - Manage the data in a table.</p> <p>CO5 - Query a database using different methods.</p> <p>CO6 - Design a form.</p> <p>CO7 - Generate a report.</p> <p>CO8 - Import and export data.</p>
IV	19111SEC04L	Communicative English Lab-IV	<p>CO1 - Learn grammar.</p> <p>CO2 - Enable to express their views in conversation</p> <p>CO3 - Develop soft skills</p> <p>CO4 - Enhance presentation skills</p>
IV	191ENVSTU	Environmental Studies	<p>CO1 - Understand ecosystem</p>

			CO2 - Know social issues and the environment
			CO3 - Learn keep the environment eco-friendly
V	19117AEC51	Developmental Biology	CO1 - Be able to list the types of characteristics that make an organism ideal for the study of developmental biology
			CO2 - Be familiar with the events that lead up to and comprise the process of fertilization.
			CO3 - Be able to compare and contrast the process of gastrulation in the various model organisms discussed
V	19117SEC52	Cell and Tissue culture	CO1 - Fundamentals of plant tissue culture. Plant regeneration and organogenesis. Embryogenesis. Organ, anther and pollen culture. Ovary, ovule and embryo culture. Callus suspension culture.
			CO2 - Protoplast, isolation, culture and fusion.
			CO3 - Production of hybrids and cybrids.
V	19117AEC53	Enzyme and enzyme technology	CO1 - The course will provide an overview of the key enzymes currently used in large scale industrial processes
			CO2 - This course includes the isolation, purification and characterization of enzymes and their applications
			CO3 - Discover the current and future trends of applying enzyme technology for the commercialization purpose of biotechnological products.
V	19117AEC54L	Developmental biology, tissue culture lab	CO1 - Demonstrate a basic understanding of developmental terms and mechanisms.
			CO2 - Utilize laboratory techniques to design and carry-out experimental studies.
			CO3 - Conservation of endangered plant species
			CO4 - Molecular, pharmacological and biochemical investigations of different aspects of plant growth and development such as in vitro flowering.
V	19117AEC55L	Enzyme and Enzyme Technology Lab	CO1 - Distinguish the fundamentals of enzyme properties, nomenclatures, characteristics and mechanisms
			CO2 - Apply biochemical calculation for enzyme kinetics
			CO3 - Compare methods for production, purification, characterization and immobilization of enzymes
			CO4 - Discuss various application of enzymes that can benefit human life
V	19117DSC56A	Discipline Specific Elective -rDNA Technology	CO1 - Utilize the knowledge on creation of a genomic library
			CO2 - Explain the significance of model organisms in recombinant DNA technology
			CO3 - This course teaches rDNA technology techniques and their application in the field of genetic engineering. They learn about plasmids, vectors and gain knowledge on the construction of cDNA libraries

V	19117DSC56B	Molecular Biology	CO1 - Understand and apply the principles and techniques of molecular biology which prepares students for further education and/or employment in teaching, basic research, or the health professions
			CO2 - Explain the concept of recombination, linkage mapping and elucidate the gene transfer mechanisms in prokaryotes and eukaryotes
			CO3 - Know the terms and terminologies related to molecular biology and microbial
V	19117BRC57	Participation in Bounded Research	CO1 - Hands on exposure to problem solving tools in contemporary research
			CO2 - Evolution of research intuitiveness and orientation
			CO3 - Familiarity with cutting edge research trends
V	19120SEC05A	Skill based Elective- V	CO1 - Work with the Photoshop workspace
			CO2 - Navigate images
			CO3 - Resize and crop images
			CO4 - Make and work with selections
			CO5 - Create new layers and perform other basic layer functions
			CO46- Transform images
V	19111SEC05L	Communicative English Lab-V	CO1 - Develop corporate skills.
			CO2 - Handle their day to day affairs well with their knowledge of language skills.
			CO3 - Get a Job.
VI	19117AEC61	Plant and Animal Biotechnology	CO1 - This course teaches organization and expression of plant and animal genome and plant and animal tissue culture
			CO2 - Students learn about transgenic animal, their application in pharmaceutical industry, cloning and its importance.
			CO3 - This course prepares the students in appreciating the its benefits and applications in biotechnological, pharmaceutical, medical and agricultural field
VI	19117SEC62	Applied Biotechnology	CO1 - Evaluate and describe systems of product research, development, and production
			CO2 - Analyze the potential for commercialization for innovations within the biotechnology industry
			CO3 - The students will gain the basic knowledge of aquaculture and Students will solve a variety of problems using creative thinking skills and analytical skills in the lab.
VI	19117SEC63L	Plant, Animal and Applied Biotechnology Lab	CO1 - The students should have knowledge on biotechnological analysis and the utilization of these knowledge about procedures and utilization of such knowledge to combine biotechnological methods to obtain analytical results

			CO2 - The students will develop fundamental knowledge in Plant Molecular Biotechnology and its application in laboratory and industry settings.
			CO3 - Describe mechanisms of plant pollination and differentiate between haploid and diploid cells and their role in sexual reproduction
VI	19117AEC64L	Environmental Biotechnology Lab	CO1 - To present an overview of important environmental biotechnologies involved in treatment of pollutants and resource recovery
			CO2 - The students will be able to demonstrate the use of environmental science principle in solving various environmental problems
			CO3 - Describe the most commonly applied disinfection methods, and the steps typically involved in drinking water treatment process
VI	19117DSC65A	Discipline Specific Elective - II Environmental Biotechnology	CO1 - Biofuels: Advantages, Energy from biomass, Biogas, Biohydrogen, Biosafety, Toxicity Bio magnification, Threshold Dose, Factor Affecting Toxicity.
			CO2 - Students will gain about environmental pollutions, preventive measures.
			CO3 - Explain the microbial processes and growth requirements underlying the activated sludge process, nitrification, denitrification, enhanced phosphorus removal, and anaerobic digestion
VI	19117DSC65B	Environmental Management	CO1 - The students in the course are exposed to the diversity, function, ecological adaptation of microorganisms within the environment
			CO2 - This course gives the importance of microbial life to key ecosystem process and teaches the role of biotechnology to address environmental issues
VI	19117PRW67	Project Work	CO1 - Understand basic concepts of research and its methodologies
			CO2 - Identify appropriate research problem and parameters
			CO3 - Prepare a research report
VI	19120SEC06A	Skill Based Elective - VI	CO1 - Learn to create animated graphics, add sound and interactivity.
			CO2 - Can develop Website
			CO3 - CD based presentations
VI	19111SEC06L	Communicative English Lab-VI	CO1 - Apply study skills
			CO2 - Widen creative thinking
			CO3 - Be a good team worker
			CO4 - Make them proficient in English


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 Head of the Department
 Department of Biotechnology
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DEPARTMENT OF BIOTECHNOLOGY

M. Sc - BIOTECHNOLOGY
19PGBTGEC

PROGRAMME OUTCOMES	
PO1	Vital Thinking: Acquire knowledgeable actions after identifying the hypothesis that frame our idea and dealings, read-through out the degree to which these hypothesis are precise and suitable, and give the impression of being at our thoughts and assessments (academic, organizational and individual) from diverse perception.
PO2	Precious communication: Study about speak, read, write and listen noticeably in person and throughout electronic media in English and in one Indian language and build meaning of the globe by connecting people, thoughts books, media and technology.
PO3	Effectual citizenship: Reveal empathetic social concern and fairnesscentred national progress and the capability to act with andtake part in civic life through volunteering
PO4	Ethics: Be aware of diverse value systems including the individual, under the ethical dimensions of personal choice, and believe responsibility for them.
PO5	Environment and Sustainability: Analyze the importance of microbes for environmental clean-up and sustainable development.
PO6	Self-directed and life-long learning: To gain the talent to employ in self-determining and life-long learning in the broadest circumstance socio technological transforms.
PROGRAM SPECIFIC OUTCOME	
PSO1	Upon master graduation, Microbiology majors will master a set of advanced skills, which would be useful to function effectively as professionals and to their continued development and learning within the field of Microbiology.
PSO2	Able to explain why microorganisms are ubiquitous in nature, inhabiting a multitude of habitats and occupying a wide range of ecological habitats.
PSO3	Able to cite examples of the vital role of microorganisms in biotechnology, fermentation, medicine and other industries important to human well-being.
PSO4	Able to demonstrate that microorganisms have an indispensable role in the environment, including elemental cycles, biodegradation etc
PSO5	Able to systematically collect record and analyze data, identify sources of error, interpret the result and reach logical conclusion.
PROGRAM EDUCATIONAL OBJECTIVES	
PEO1	To provide detailed knowledge of Microbiology and their application fields. To understand the beneficial and harmful role of microorganisms in the environment and in the industries.
PEO2	To understand the fundamentals of physiological reactions including metabolic

	pathways and biochemical reactions in microorganisms. To understand the fundamental concepts of immunology, biochemistry, biotechnology and genetics etc.
PEO3	To develop human resource and entrepreneurs in microbiology with the ability to independently start their own ventures or small biotech units in the field of biotechnology.
PEO4	Understand modern microbiology - practices and approaches with an emphasis in technology application in pharmaceutical, medical, industrial, environmental and agricultural areas.
PEO5	Gain experience with standard molecular tools and approaches utilized: manipulate genes, gene products and organisms. Become familiar with handling of Laboratory animals for the research purpose. Interpret differences in data distributions via visual displays.

MAPPING OF PEO AND PO
M.Sc., CURRICULUM MAPPING
PROGRAMME EDUCATIONAL OBJECTIVES VS PROGRAMME OURCOME

POs/PEO	PO1	PO2	PO3	PO4	PO5
PEO1	*	*	*	*	
PEO2	*			*	*
PEO3		*		*	
PEO4	*	*			*
PEO5	*		*		

Semester	Course Code	Title of the Course	COs
I	19217AEC11	General Microbiology	CO1 - Students can gain the idea of how to identify the microorganisms based on the modern polyphasic approach.
	19217AEC12	Molecular genetics	CO1 - After successful completion of the paper the students will get an overall view about genetic makeup of organisms and can take up a career in research.
	19217AEC13	Biochemistry	CO1 - This paper in biochemistry has been designed to provide the student with a firm foundation in the biochemical aspects of cellular functions which forms a base for their future research.
	19217SEC14L	Microbiology & Molecular Genetics Lab	CO1 - After successful completion of the paper the students will get an overall view about genetic makeup of organisms and can take up a career in research.

	19217DSC15A	Immunology	CO1 - This course will provide the student insights into the various aspects of Immunology such as classical immunology, clinical immunology, Immunotherapy and diagnostic immunology.
	19217DSC15B	Biosafety and Biodiversity	CO1 - To study the diversity of plants and animal life in a particular habitat, ethical issues and potential of biotechnology for the benefit of man kind
	19217RLS16	Research Led Seminar	CO1 - Exposure to various research domains .
CO2 - Acquaintance with languages of research			
CO3 - Development of research aptitude			
II	19217AEC21	Cell & Molecular Biology	CO1 - Students after completion of this paper will be exceptionally well prepared to pursue careers in cellular and sub cellular biological research, biomedical research, or medicine or allied health fields.
	19217AEC22	Biophysics & Bioinformatics	CO2 - This paper has been designed to give the students comprehensive training in the emerging and exciting upcoming field of Systems Biology, which will help students to get career in both industry/R&D.
	19217AEC23	Industrial Biotechnology	CO1 - This course is important in the era of industrialization leading to environmental hazards and hence will help students to take up a career in tackling industrial pollution and also to take up the research in areas like development of biological systems for remediation of contaminated environments (land, air, water), and for environment-friendly processes such as green manufacturing technologies and sustainable development.
	19217SEC24L	Molecular Biology & Industrial Biotechnology Lab	CO1 - Students after completion of this paper will be exceptionally well prepared to pursue careers in cellular and sub cellular biological research, biomedical research, or medicine or allied health fields
	19217DSC25A	Endocrinology	CO1 -To know the pathophysiological significance of the system with special reference to humans.
	19217DSC25B	Intellectual Property Rights	CO1 - To get registration in our country and foreign countries of their invention, designs and thesis or theory written by the students during their project work and for this they must have knowledge of patents, copy right, trademarks, designs and information Technology Act. Further teacher will have to demonstrate with products and ask the student to identify the different types of IPR'
	19217RMC26	Research Methodology	CO1 - Understanding research questions and tools
			CO2 - Experience in scientific writings
CO3 - Practice in various aspects of scientific publications			

			CO4 - Inculcation of research ethics
	19217BRC27	Participation in Bounded Research	CO1 - Hands on exposure to problem solving tools in contemporary research
			CO2 - Evolution of research intuitiveness and orientation
			CO3 - Familiarity with cutting edge research trends
III	19217AEC31	Genomics	CO1 - Acquire the aspects of Gene Contig and Shotgun method.
			CO2 - Know the features of the Genome Mapping databases.
	19217AEC32	Proteomics	CO1 - Gain knowledge on phylogenetic profiles
			CO2 - Describe the features of Yeast two-hybrid system.
	19217SEC33L	Genomics & Proteomics - Lab	CO1 - This paper will help students interested in careers as laboratory, research or animal care technicians in the fields of veterinary and human health or biotechnology.
	19217DSC34A	Discipline specific elective III Nanobiotechnology	CO1 - This course will act as a bridge between students from non-biology course at all levels
	19217DSC34B	Discipline specific elective III Environmental biotechnology	CO1 - This course is important in the era of industrialization leading to environmental hazards and hence will help students to take up a career in tackling industrial pollution and also who is willing to take up the research in areas like development of biological systems for remediation of contaminated environments (land, air, water), and for environment- friendly processes such as green manufacturing technologies and sustainable development
IV	19217AEC41	Food Technology	CO1 - To understand the basic food safety issues in the food market
			CO2 - To develop and evaluate quality of new food products using objective and subjective methodologies.
			CO3 - To understand the basic concepts in food chemistry and food analysis
	19217AEC42	Bio instrumentation	CO1 - Check for analytical functions and find the analytical function and study
			CO2 - Learn the measurement systems, errors of measurement
			CO3 - Demonstrate basic knowledge of Biotechniques
	19217SEC43L	Food technology and Bio instrumentation lab	CO1 - Ability to apply principles of food engineering in industry.
			CO2 - Understand, identify and analyze a problem related to food industry and ability to find an appropriate solution for the same.

19217DSC44A	Gene therapy utilization pharmacology	CO1 - Understand some of the types of disease that might be treatable by gene therapy
		CO2 - Understand the basic principles of genetic manipulation
		CO3 - Understand how genetics may be used in the design of drugs
19217DSC44B	Plant conservation & disaster management	CO1 - To make sustainable utilization of species and ecosystems
		CO2 - Familiarity with disaster management theory (cycle, phases) Knowledge about existing global frameworks and existing agreements (e.g. Sendai)
		CO3 - Regulatory practices, biosensors and applications in Pharmaceuticals
		CO4 - Quality Assurance and Validation
19217PRW45	Project work	CO1 - Experience from a master's project and international literature.
		CO2 - Develop ability to independently carry out a complete scientific process.
		CO3 - Learn about how to write dissertations and proposals for the scientific community.



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DEPARTMENT OF BIOTECHNOLOGY

B.Sc. BIOTECHNOLOGY
CURRICULUM

REGULATION 2019



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SCHOOL OF ARTS AND SCIENCE

DEPARTMENT OF BIOTECHNOLOGY

B.Sc., CURRICULUM - REGULATION-2019

B.Sc., Graduate Attributes

- Research, inquiry and analytical thinking abilities.
- Capability and motivation for intellectual development.
- Ethical, social and professional understanding.
- Communication in intra and inter disciplinary
- Teamwork, collaborative and management skills in scientific research
- Information literacy in respective discipline

B.Sc., Program Educational Objectives: PEO

- PEO 1: To obtain detailed information about the fundamentals of Biotechnology, allied subjects and life-skills.
- PEO 2: To provide information about the molecular methods which involved in cellular processes of living systems such as microbes to higher order organisms for applied aspects. To address the emerging need for skilled scientific manpower with research ethics involving organisms.
- PEO 3: To impart the basics and current molecular tools in the areas of Molecular Diagnostics, Fermentation Technology, Plant, Animal & Environmental Biotechnology are included to train the students for man power development and also sensitize them to scope for research. The practical subjects will provide information about the careers in the industry and applied research where biological system is employed.
- PEO 4 : To make the graduates of Biotechnology to learn and to adopt in a competitive world of technology update and contribute to all forms of life
- PEO5- To enable them to execute a research objective through experimentation

B.Sc., Programme Specific Outcome (PSO)

- PSO1-Graduates will exhibit contemporary knowledge in Biotechnology and students will be eligible for doing jobs in pharmaceutical and biotechnological Industry.
- PSO2-An expert in biotechnology and allied fields (medical, microbial,

agricultural, environmental, plant and animal) for utilizing the practical skill to address biotechnological challenges.

- **PSO3-** Graduates will be able to work individually as well as in team to survive in multidisciplinary environment.
- **PSO4-** If students will engage themselves in the process of effective learning, it will give opportunities to utilize acquired knowledge for the catering the needs of science and technology as well as for the betterment of human mankind.
- **PSO5-** Graduates will be able to understand the potentials, and impact of biotechnological innovations on environment and their implementation for finding sustainable solution to issues pertaining to environment, health sector, agriculture, etc.

B.sc., Program Outcome PO

- **PO1-** Understand the basic concepts, fundamental principles, and the scientific theories related to various scientific phenomena and their relevancies in the day-to-day life
- **PO2-** Understanding and better knowledge of the causes, types and control methods for environmental pollution by the students.
- **PO3-** The student will be able to discuss the mechanisms associated with gene expression system in prokaryotes and eukaryotes.
- **PO4-** Developed various communication skills such as reading, listening, speaking etc.,
- **PO5-** Acquired the skills in handling scientific instruments, planning and performing in laboratory experiments
- **PO6-** Ethics: Convey and practice social, environmental and biological ethics.
- **PO7-** To get knowledge about research tools and learn to do review literature. Ability to carry out independent literature survey corresponding to the specific publications type and assess basic research tool

B.Sc., Biotechnology (C)

- C1- Fundamentals of Biological System
- C2- Fundamentals of Biological System Lab
- C3- Biological Chemistry
- C4- Biological Chemistry Lab
- C5- Cell Biology and Genetics
- C6- Cell Biology and Genetics Lab
- C7- Microbiology
- C8- Microbiology Lab
- C9- Research LED Seminar
- C10- Plant Physiology
- C11- Plant Physiology Lab
- C12- Immunology
- C13- Immunology Lab

- C14- Research Methodology
- C15- Animal Physiology
- C16- Animal Physiology Lab
- C17- Bioinformatics and Biostatistics
- C18- Bioinformatics and Biostatistics Lab
- C19- Development Biology
- C20- Cell and Tissue Culture
- C21- Enzyme and Enzyme Technology
- C22- Development Biology, Tissue Culture Lab
- C23- Enzyme and Enzyme Technology Lab
- C24- Discipline Specific Elective
- C25- Plant and animal Biotechnology
- C26- Applied Biotechnology
- C27- Plant, Animal and Applied Biotechnology Lab
- C28- Environmental Biotechnology Lab
- C29- Discipline Specific Elective
- C30- Package lab- I-VI
- C31- Communicative English Lab I-VI

B.Sc., Curriculum Mapping

Programme Educational objectives Vs Programme Outcome

Programme Outcome PO Programme specific outcome PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
PSO1	*	*		*	*	*	*
PSO2			*		*	*	*
PSO3	*	*	*		*		
PSO4	*	*	*			*	*
PSO5	*		*	*	*		*

B.Sc. Biotechnology Curriculum Mapping

Programme Outcome Vs Course Outcome

Programme Outcome- PO Courses Outcome-CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	*	*	*	*	*	*	*
CO2	*	*	*	*	*	*	*
CO3	*	*	*	*	*	*	*
CO4	*	*	*	*	*	*	*
CO5	*	*	*	*	*	*	*
CO6	*	*	*	*	*	*	*
CO7				*	*	*	*
CO8	*	*	*	*	*	*	*
CO9				*	*	*	*
CO10	*	*	*	*	*	*	*
CO11			*	*	*	*	*
CO12	*	*	*	*	*	*	*
CO13	*	*	*	*	*	*	*
CO14	*	*	*	*	*	*	*
CO15	*	*	*	*	*	*	*
CO16	*	*	*	*	*	*	*
CO17	*	*	*	*	*	*	*
CO18	*	*	*	*	*	*	*
CO19	*	*	*	*	*	*	*

CO20				*	*	*	*
CO21	*	*	*	*	*	*	*
CO22				*	*	*	*
CO23	*	*	*	*	*	*	*
CO24			*	*	*	*	*
CO25	*	*	*	*	*	*	*
CO26	*	*	*	*	*	*	*
CO27	*	*	*	*	*	*	*
CO28	*	*	*	*	*	*	*
CO29	*	*	*	*	*	*	*
CO30	*	*	*	*	*	*	*
CO31	*	*	*	*	*	*	*

EMPLOYABILITY

SKILL DEVELOPMENT

ENTREPRENEURSHIP

EMPLOYABILITY/ SKILL DEVELOPMENT/ ENTREPRENEURSHIP



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B. Se., BIOTECHNOLOGY REGULATION- 2019

COURSE STRUCTURE

Course Code	Course Title	L	T	P	C
SEMESTER I					
19110AEC11/ 19111AEC11/ 19132AEC11/ 19135AEC11	Language-I (Tamil-I/ Advanced English-I/ Hindi-I/ French-I)	4	0	0	2
19111AEC12	English-I	4	0	0	2
19117AEC13	Fundamentals of Biological System	6	0	0	4
19117AEC14L	Fundamentals of Biological System Lab	0	0	3	2
19115AEC15A	Biological Chemistry	6	1	0	3
19115AEC16AL	Biological Chemistry Lab	0	0	3	2
191 SEC01	Skill Based Elective-I	0	0	2	1
19111SEC01L	Communicative English Lab-I	0	0	1	1
191INDCONS	Indian Constitution	-	-	-	-
	Total	20	1	9	19
SEMESTER II					
19110AEC21/ 19111AEC21/ 19132AEC21/ 19135AEC21	Language-II (Tamil-II/ Advanced English-II/ Hindi-II/ French-II)	4	0	0	2
19111AEC22	English-II	4	0	0	2
19117AEC23	Cell Biology and Genetics	6	1	0	4
19117AEC24L	Cell Biology and Genetics Lab	0	0	3	2
19116AEC25	Microbiology	6	0	0	3
19116AEC26L	Microbiology Lab	0	0	3	2
19117RLC27	Research LED Seminar	-	-	-	1
191 SEC02	Skill Based Elective -II	0	0	2	1
19111SEC02L	Communicative English Lab-II	0	0	1	1
	Total	20	1	09	20
SEMESTER III					

19110AEC31/ 19111AEC31/ 19132AEC31/ 19135AEC31	Language-III (Tamil-III/ Advanced English-III / Hindi-III/ French-III)	4	0	0	2
19111AEC32	English-III	4	0	0	2
19117AEC33	Plant Physiology	5	0	0	4
19117AEC34L	Plant Physiology Lab	0	0	3	2
19117AEC35	Immunology	5	1	0	5
19117AEC36L	Immunology Lab	0	0	3	2
19117RMC37	Research Methodology	2	0	0	2
191 SEC03	Skill based Elective- III	0	0	2	1
19111SEC03L	Communicative English Lab-III	0	0	1	1
	Total	20	1	09	21
	SEMESTER IV				
19110AEC41/ 19111AEC41/ 19132AEC41/ 19135AEC41	Language-IV (Tamil-IV/ Advanced English-IV/ Hindi-IV/ French-IV)	4	0	0	2
19111AEC42	English-IV	4	0	0	2
19117AEC43	Animal Physiology	5	0	0	4
19117AEC44L	Animal Physiology Lab	0	0	3	2
19117AEC45	Bioinformatics and Biostatistics	6	0	0	5
19117AEC46L	Bioinformatics and Biostatistics Lab	0	0	3	2
191 SEC04	Skill based Elective- IV	0	0	2	1
19111SEC04L	Communicative English Lab-IV	0	0	1	1
191ENV1STU	Environmental Studies	2	0	0	2
	Total	21	0	9	21
	SEMESTER V				
19117AEC51	Development Biology	5	0	0	4
19117SEC52	Cell and Tissue Culture	5	0	0	4
19117AEC53	Enzyme and Enzyme Technology	4	1	0	4
19117AEC54L	Development Biology, Tissue Culture Lab	0	0	3	2
19117AEC55L	Enzyme and Enzyme Technology Lab	0	0	3	2
19117DSC56	Discipline Specific Elective -I	5	0	0	3
19117BRC57	Participation in Bounded Research	1	1	1	1
191 SEC05	Skill Based Elective -V	0	0	2	1
19111SEC05L	Communicative English Lab - V	0	0	1	1
	Total	19	1	9	21
	SEMESTER VI				
19117AEC61	Plant and animal Biotechnology	5	0	0	4

19117SEC62	Applied Biotechnology	5	0	0	5
19117SEC63L	Plant, Animal and Applied Biotechnology Lab	0	0	3	2
19117AEC64L	Environmental Biotechnology Lab	0	0	3	2
19117DSC65	Discipline Specific Elective - II	5	0	0	3
19117PRW6	Project Work	1	1	1	1
191 SEC06	Skill Based Elective –VI	0	0	2	1
19111SEC06L	Communicative English Lab-VI	0	0	1	1
19117EXACT	Extension Activities	-	-	-	-
19117PEE	Programme Exit Examination	-	-	-	1
	Total	19	0	9	25
	Total Credits for the Programme				127

Discipline Specific Electives

Semester	Discipline Specific Elective Courses-I
V	a) 19117DSC56A - rDNA Technology b) 19117DSC56B - Molecular Biology
	Discipline Specific Elective Courses-II
VI	a) 19117DSC65A- Environmental Biotechnology b) 19117DSC65B- Environmental Management

Open Electives

Semester	Open Elective Courses
VI	a) 19110OEC-Tamil Ilakiya varalaru b) 19111OEC-Journalism c) 19112OEC-Development of Mathematical Skills d) 19113OEC-Instrumentation e) 19114OEC-Food and Adulteration f) 19120OEC-E-Learning g) 19122OEC-Web Technology h) 19161OEC-Banking services

Skill based Electives

Semester	Skill based Elective Courses
I	a) 19120SEC01AL-Package Lab – I b) 19160SEC01B-Soft skill – I
II	a) 19120SEC02AL-Package Lab – II b) 19160SEC02B-Soft skill – II
III	a) 19120SEC03AL-Package Lab – III b) 19160SEC03B-Soft skill – III
IV	a) 19120SEC04AL-Package Lab – IV b) 19160SEC04B- Soft skill – IV
V	a) 19120SEC05AL-Package Lab – V b) 19160SEC05B-Soft skill - V
VI	a) 19120SEC06AL-Package Lab – VI b) 19160SEC06B-Soft skill – VI

Credit Distribution

Sem	AEC	SEC	DSC	GEC	Research	Others	Total
I	17	2	-	-	-	-	19
II	17	2	-	-	1	-	20
III	17	2	-	-	2	-	21
IV	17	2	-	-	-	2	21
V	12	5	3	-	1	-	21
VI	06	9	3	2	4	1	25
Total	86	22	6	2	08	3	127

SEMESTER - 1

Semester	Subject Code	Title of the Course
1	19110AECT1	ഭൂമിശാസ്ത്രം ഭൂമിശാസ്ത്രം, ഭൂമിശാസ്ത്രം, ഭൂമിശാസ്ത്രം, ഭൂമിശാസ്ത്രം ഭൂമിശാസ്ത്രം, ഭൂമിശാസ്ത്രം, ഭൂമിശാസ്ത്രം, ഭൂമിശാസ്ത്രം

ഗ്രന്ഥ ലയനം - ഭാഗം - 1

അംഗ - I

ഗ്രന്ഥകൃത്ത് നേതൃത്വം ലഭിക്കും

- ഭൂമിശാസ്ത്രം
- ഭൂമിശാസ്ത്രം
- ഭൂമിശാസ്ത്രം
- ഭൂമിശാസ്ത്രം

ഗ്രന്ഥകൃത്ത്

- ഭൂമിശാസ്ത്രം

അംഗ - II

ഭൂമിശാസ്ത്രം - ഭൂമിശാസ്ത്രം

ഭൂമിശാസ്ത്രം - ഭൂമിശാസ്ത്രം

ഭൂമിശാസ്ത്രം, ഭൂമിശാസ്ത്രം - ഭൂമിശാസ്ത്രം, ഭൂമിശാസ്ത്രം - ഭൂമിശാസ്ത്രം

ഭൂമിശാസ്ത്രം - ഭൂമിശാസ്ത്രം

ഭൂമിശാസ്ത്രം - ഭൂമിശാസ്ത്രം

അംഗ - III

ഭൂമിശാസ്ത്രം - ഭൂമിശാസ്ത്രം, ഭൂമിശാസ്ത്രം, ഭൂമിശാസ്ത്രം

അംഗ - IV

ഭൂമിശാസ്ത്രം

ഭൂമിശാസ്ത്രം

ഭൂമിശാസ്ത്രം

അംഗ - V

ഭൂമിശാസ്ത്രം

ഭൂമിശാസ്ത്രം, ഭൂമിശാസ്ത്രം, ഭൂമിശാസ്ത്രം, ഭൂമിശാസ്ത്രം

Course Code	Course Title	L	T	P	C
19111AEC11	Advanced English-I	4	0	0	2

Aim:

- To improve the knowledge of English

Objective:

- To familiarize with the glossary terms, figures of speech
- To improve vocabulary
- To learn how to edit and proof read
- To know the comparison and contrast and cause and effect forms
- To understand the impact of the speeches of famous people

Outcome:

- Develop vocabulary
- Read and comprehend literature

UNIT -I

Glossary of grammar terms

Figures of speech

UNIT - II

Foreign words and phrases

British and American Vocabulary

UNIT - III

Speeches of famous people;

Mahatma Gandhi-Abraham Lincoln-Swami Vivekananda-John F. Kennedy

UNIT - IV

Editing

Proof reading

UNIT - V

Comparison and contrast

Cause and effect

SKILL DEVELOPMENT

References:

English Grammar	-Wren and Martin
English Grammar and Composition	-Radhakrishna Pillai
Essentials of Business Communication	-Rajendra Pal & J.S Korlahalli Sultan Chand & Sons
English for writers and translators	-Robin Macpherson
Technical Communication	-Meenakshi Sharma & Sangeetha Sharma
The World's Great Speeches	-Sudhir Kumar Sharma Galaxy Publishers
English Work Book-I&II	-Jewelry Jawahar

Course Code	Course Title	L	T	P	C
19111AEC12	English-I	4	0	0	2

Aim:

- To acquaint students with learning English through literature

Objective:

- To improve English delightfully through simple poems, essays
- To throw light on fiction
- To read and comprehend literature

Outcome:

- Read and comprehend literature

UNIT -I

The Art of Reading - Lin Yutang

An Eco-Feminist Vision - Aruna Gnanadason

UNIT - II

The Merchant of Death - Nanda Kishore Mishra & John Kennel

She Spoke for all Nature - Young world 'The Hindu'

UNIT -III

Because I could not Stop for Death - Emily Dickinson

Stopping by Woods on a Snowy Evening - Robert Frost

UNIT -IV

Enterprise - Nissim Ezekiel

Love poem for a wife - A. K. Ramanujam

UNIT -V

Oliver Twist - Charles Dickens

SKILL DEVELOPMENT

References: -

The Art of Reading/ Experiencing Poetry. -S.Murugesan and Dr.K.Chellappan
Emerald Publishers

Course Code	Course Title	L	T	P	C
19117AEC13	Fundamentals of Biological system	6	1	0	5

Aim:

- To study the diversity of life, the interactions of the environment, to study problems, and to propose solutions to those problems.

Objectives:

- (Science: psychology) Perceptible to the external senses.
- (Science: ophthalmology) The lens or system of lenses in a microscope (or telescope) that is nearest to the object under examination

Outcomes:

- Understand the physical, chemical, and mathematical basis of biology
- Appreciate the different scales of biological systems
- To understand the Basics in life sciences, evolution and organization of life, living non-living things
- To understand the basics of biomolecules, carbohydrates, proteins, lipids and Nucleic acids

UNIT – I

Basics in life science; definition of Biology- evolution and organization of life- living and non-living things- prokaryotes and eukaryotes- basis of classification of microbes, plants and animals up to order with 2 examples and salient features- nomenclature.

SKILL DEVELOPMENT

UNIT II

Inorganic perspective of life: atoms molecules, chemical reactions and concept of equilibrium, colligative properties of solution, laws of thermodynamics, bonding, water and its significance, pH maintenance- acids and bases.

UNIT III

Introduction to biomolecules: carbohydrates, proteins, lipids and Nucleic acids- classification- general properties- functions

UNIT IV

Cellular organization of life: cell theory- cell organization-cell organelles- plant and animal cell- tissue organization- cell size and its constraints- movement in and out of the cell

UNIT V

Biology of environment: biotic and abiotic factors- influence of environmental factors on life- major biogeo cycles-carbon, nitrogen, oxygen cycles- ecosystems- food web- food chain and pyramids.

REFERENCE

1. Biology 2nd edition, George H. Fried and George J. Hademenos, Tata MacGraw Hill Publishers.

Course Code	Course Title	L	T	P	C
19117AEC14L	Fundamentals of Biological system Lab	0	0	3	3

Aim:

- To understanding the biological natural theory, characters and futures of some biological techniques

Objectives:

- The foundation of biology as it exists today is based on five basic principles. They are the cell theory, gene theory, evolution, homeostasis, and laws of thermodynamics. Cell Theory

Outcomes:

- The learners will acquire knowledge on the structure and functions relationship of Biological system and as well their roll in various biological process
- To know the cellular organization of life, cell theory- cell organization-cell organelles- plant and animal cell
- To understanding the basic fundamentals of Biological System

EX:

- Microscopic techniques- types
- Observation of prokaryotic and eukaryotic cells
- Living cell / temporary/ permanent preparations histochemical techniques
- Staining procedure *in vivo* and *in vitro*, living and non-living
- Different types of cells and tissues
- Taxonomical identification of any 2 plants
- Species diversity studies- any 2 methods
- Study of representative animals for each group
- Plankton analysis

SKILL DEVELOPMENT

REFERENCE:

1. Experimental procedures in Life Sciences, S.Rajan and R. Selvi Christy, 2010, Anjanaa book house.

Course Code	Course Title	L	T	P	C
19115AEC15	Biological Chemistry	5	0	0	5

Aim:

- To understanding on the underlying principles of Biomolecules

Objectives:

- This course is designed to provide clear understanding on the underlying principles of structures and functions of biomolecules to the students of the subjects.

Outcomes:

- The learners will acquire knowledge on the structure and functions relationship of proteins nucleic acid carbohydrates and as well their roll in various biological process
- They study the influence and role of structure in reactivity of biomolecules
- Through this course the students are exposed to importance of biological macromolecules

UNIT I

Carbohydrates: definition- classification- monosaccharide – structure, function and biological significance- disaccharides- polysaccharides- types and biological importance- carbohydrate metabolism- glycolysis- TCA cycle- HMP shunt- glycogenesis- glycogenolysis- oxidative phosphorylation.

UNIT II

Amino acids and proteins: amino acid classification- essential and non-essential amino acids- structure and properties- proteins- definition- classification- functions- protein metabolism- deamination – decarboxylation- transamination of amino acids- urea cycle.

UNIT III

Lipids: classification- physical and chemical properties- saturated and unsaturated fatty acids- structure of cell membrane- fluid mosaic model- lipid metabolism- beta oxidation- biosynthesis of saturated fatty acids.

SKILL DEVELOPMENT

UNIT IV

Nucleic acids: Nucleoside, Nucleotide, DNA- Base composition, double helical structure, RNA - Types.

UNIT V

Vitamins, minerals and hormones: classification – occurrence- deficiency symptoms- biochemical functions.

REFERENCES

- Biochemistry by Jain, 2005, Chand Publications,
- Biochemistry by Voet and Voet.
- Biochemistry by L.Stryer

Course Code	Course Title	L	T	P	C
19115AEC16L	Biological Chemistry Lab	0	0	3	3

Aim:

- To understanding the molecular orbital theory, preparation and properties of inorganic compounds.

Objectives:

- Theory of covalent bond, polar effects and stereochemistry of organic compounds.
- About important industrial chemicals like silicones, fuel gases and fertilizers and their impact on environment.

Outcomes:

- Students will use current biochemical and molecular techniques to plan and carry out experiments.
- Biochemistry Majors will gain proficiency in basic laboratory techniques in both chemistry and biology, and be able to apply the scientific method to the processes of experimentation and hypothesis testing
- At the end of the course, the students have a thorough understanding on the role of biomolecules and their functions

EX:

- Preparation of buffers
- Preparation of solutions of various dilutions.
- Estimation of carbohydrates.
- Estimation of proteins.
- Estimation of lipids.
- Qualitative analysis of carbohydrates
- Qualitative analysis of amino acids.
- Separation of amino acids by TLC method.
- Estimation of pH

SKILL DEVELOPMENT

REFERENCES:

- Biochemical methods II Edition Sadasivam, A. and Manickam, A. New age international P ltd. Publishers.

**Skill Based Elective-I
MS-WORD**

Course Code	Course Title	L	T	P	C
19120SEC01AL	Package Lab-I	0	0	2	1

OUTCOME:

- Recognize when to use each of the Microsoft Office programs to create professional and academic documents
- Use Microsoft Office programs to create personal, academic and business documents following current professional and/or industry standards.
- Apply skills and concepts for basic use of computer hardware, software, networks, and the Internet in the workplace and in future coursework as identified by the internationally accepted Internet and Computing Core (IC3) standards.

EX:

1. Prepare a bio-data with photo using text styles.
2. Prepare a college course details with headings, bullets and numbering.
3. Prepare a document in a newspaper format with header and footer.
4. Create a calendar by using auto format.
5. Prepare a contemporary letter using templates.
6. picture insertion and alignment
 - a. prepare a greeting card
 - b. prepare a handout
7. Create a mark sheet using tables. And find out the total marks.
8. Prepare a business letter for more than one company using mail merge

Course Code	Course Title	L	T	P	C
19160SEC01B	Soft Skill I	0	0	2	1

Outcome:

- Make effective communication

Part- I Effective Communication

UNIT I Effective communication I

Oral Communication: Listening skills -Speaking skills (what to say and how to say it) – Gender neutral Language-Conflict, criticism, anger- Telephone skills.

UNIT II Effective communication II

Written Communication: Mechanics of writing, letters, notes; and reports- Resume preparation Faxes- Web sites- Email and Memos
Nonverbal Communication: Behavior, Body language and Attitude.

Course Code	Course Title	L	T	P	C
19111SEC01L	Communicative English lab -I	0	0	1	1

Aim:

- To acquaint with the basic grammar

Objective:

- To know English grammar and all the concomitant linguistic items
- To be aware of basic concepts related to the study of communication
- To understand the types of sentences and its patterns

Outcome:

- Understand grammar
- Enrich vocabulary
- Understand the process of communication
- Develop listening skill

UNIT -I

Noun

Pronoun

Adjective

UNIT - II

Verb

Adverb

UNIT -III

Conjunction

Preposition

Interjection

UNIT - IV

Kinds of Sentences

UNIT -V

Patterns of sentences

References: -

A Practical English Grammar

English Grammar

-A.J Thomson and A.V.Martinet

-Wren and Martin

Course Code	Course Title	L	T	P	C
19IINDCONS	Indian Constitution	1	0	0	1

Objectives:

1. To make the students understand about the democratic rule and parliamentary administration
2. To appreciate the salient features of the Indian constitution
3. To know the fundamental rights and constitutional remedies
4. To make familiar with powers and positions of the union executive, union parliament and the Supreme Court

To exercise the adult franchise of voting and appreciate the electoral system of Indian democracy.

Outcome:

- Democratic values and citizenship Training are gained
- Awareness on Fundamental Rights are established
- Learn the functions of union and State Governments
- Learn the power and functions of the Judiciary
- Appreciate of Democratic Parliamentary Rule

Unit I: The making of Indian constitution

The constitution assembly organization –character –work salient features of the constitution- written and detailed constitution –socialism –secularism–democracy and republic.

Unit II: Fundamental rights and fundamental duties of the citizens

Right of equality –right of freedom- right against exploitation –right to freedom of religion- cultural and educational rights –right to constitutional remedies –fundamental duties.

Unit III: Directive principles of state policy

Socialistic principles–Gandhi a principles-liberal and general principles –differences between fundamental rights and directive principles

Unit IV: The union executive, union parliament and Supreme Court

Powers and positions of the president –qualification _method of election of president and vice president –prime minister –Rajya Sabah –Lok Sabah. the supreme court –high court –functions and position of supreme court and high court

Unit V: State council –election system and parliamentary democracy in India

State council of ministers –chief minister –election system in India–main features election commission–features of Indian democracy.

References:

- 1) Palekar.s.a. Indian constitution government and politics, ABD publications, India
- 2) Aiyer, alladi krishnaswami, Constitution and fundamental rights 1955.
- 3) Markandan, k.c.directive Principles in the Indian constitution 1966.
- 4) Kashyap. Subash c, ourparliament, National book trust, New Delhi 1989

SEMESTER - II

Semester	Subject Code	Title of the Course
II	19110AEC21	கொடும் - பத்தி இலக்கியம், சிறுநகைச்சுவல், இலக்கணம், இலக்கிய அபிவிருத்தி (பத்தி)

அலகு-I

நிருபுலகவியல் நோயல் - இடிகுலம் தல்குலம் - பதிகம்
 நிருபுலகவியல் நோயல் - அகலம் பாலிகுலம் திலகல - பதிகம்
 திருவாசல - கொல்த திருவாசலம்
 திருபத்திரம் - 25, 85, 139, 238, 293, 292, 239, 724, 2104, 2716
 திருவாசல - கொலகலம் பாலகல 1,1,9

அலகு-II

தலகல - 1 பாலகல - திருவாசலகல - கலகலகலகலகல கலகலகலகலகல
 கொலகலகல - 1 பாலகல - திருவாசலகல - தலகலகல
 தலகலகல திருவாசல - 10 பாலகலகல - அலகல திருவாசல

அலகு-III

சிறுநகைச்சுவல் -
 குலகல, தலகல - கலகல, கொலகல
 கலகல, கலகல, கலகல கலகலகலகலகல - தலகலகலகலகலகலகலகல

அலகு-IV

இலக்கணம் - கொல
 கலகலகலகலகல

அலகு-V

இலக்கிய அபிவிருத்தி
 கலகல, கலகலகல இலக்கியகலகல
 சிறுநகைச்சுவல்பாலகல
 கலகலகலகலகல
 கலகல

Course Code	Course Title	L	T	P	C
19111AEC21	Advanced English-II	4	0	0	2

Aim:

- To improve the knowledge of English

Objective:

- To understand the format of e-mail, fax and memos
- To write itinerary, checklist, invitation, circular, instruction, recommendations
- To understand the impact of the biographies of famous people

Outcome:

- Develop Technological skill.
- Able to write in a variety of formats
- Read biographies and develop personality

UNIT -I

E-mail

Fax

Memos

UNIT - II

Itinerary

Checklist

UNIT - III

Invitation

Circular

UNIT - IV

Instruction

Recommendations

UNIT - V

Biographies of famous people;

Mother Teresa-Madam Curie-Charles Chaplin-Vikram Sarabhai

References:

English Grammar

-Wren and Martin

English Grammar and Composition

-Radhakrishna Pillai

Technical Communication

-Meenakshi Sharma & Sangeetha Sharma

Inspiring Lives

-Maruthi Publishers

English Work Book-I&II

-Jewelcy Jawahar

Course Code	Course Title	L	T	P	C
19111AEC22	English-II	4	0	0	2

Aim:

- To acquaint learners with different trends of writing

Objective:

- To empower students to acquire language skills through literature
- To enable the students to appreciate literature
- To develop the conversational skills through one act plays

Outcome:

- Appreciate different forms of literature
- Acquire language skills through literature
- Broadens the horizon of knowledge

UNIT – I

Ecology

-A.K. Ramanujan

Gift

-Alice Walker

The First Meeting

-Sujata Bhatt

UNIT – II

Fueled

-Marcie Hans

Asleep

-Ernst Jandl

Buying and selling

-Khalil Gibran

UNIT – III

The End of living and The Beginning of Survival

- Chief Seattle

My Wood

- E.M.Forster

The Meeting of Races

- Rabindranath Tagore

UNIT – IV

The Refugee

-K. A. Abbas

I Have a Dream

-Martin Luther king

Those People Next Door

-A.G. Gardiner

UNIT – V

Marriage is a private Affair

-Chinua Achebe

The Fortune Teller

-Karel Capek

Proposal

-Anton Chekov

References:-

Gathered Wisdom

-Gowri Sivaraman Emerald Publishers

Course Code	Course Title	L	T	P	C
19117AEC23	Cell biology and genetics	6	1	0	6

Aim:

- Students will understand the cellular components underlying mitotic cell division.

Objectives:

- Students will understand the structures and purposes of basic components of prokaryotic and eukaryotic cells, especially macromolecules, membranes, and organelles
- Students will understand how these cellular components are used to generate and utilize energy in cells

Outcomes:

- This paper will enable the students to learn the basics and lay strong foundation in understanding the composition of cells, how cells work is fundamental to living systems.
- The course outcome is to train the students in understanding genetics and relate modern DNA technology for disease diagnostics and therapy
- Students will be taught Mendelian genetics, their principles and gene interaction.
- This gives them a strong foundation on the basic unit of life.

UNIT I

Genetics- History, genetics in society and biology, fundamental concept of genetics-

Mendelian genetics: Monohybrid cross, dihybrid cross, testercross, backercross

Sex – linked chromosomes, genetic Vs environmental effect-multiple alleles, Deviations from Mendelian genetic principles.

UNIT II

Prokaryotic and eukaryotic chromosomes-organization and structure-transposable elements, cellular reproduction in prokaryotic and eukaryotic cells-significance-cell cycle-linkage, mechanism of crossing over- genetic variability

UNIT III

Gene concept: modern concept of gene- DNA as a genetic material- Watson and Crick model of DNA- DNA replication- repair- telomeres – linkage-recombination-gene mapping-DNA senescence

SKILL DEVELOPMENT

UNIT IV

Prokaryotic and eukaryotic transcription and translation-RNA and its types-genetic code.
Control of Gene expression: operon concept- lac and trp operon.

UNIT V

Gene mutation and chromosome variations-genetic disorders- in borne errors of metabolism, banding techniques, chromosomal aberrations.

Cell junctions and the extracellular matrix-cell-cell junctions-the extracellular matrix cancer and oncogenes

REFERENCES

Genetics- A conceptual Approach by Benjamin A.Pierce, 4th Edn, 2012 W.H. Freeman and company

Molecular biology of the cell by bruce alberts, Alexander johnson, julian lewis, David morgan, martin raff, keith Roberts, peter walter, 6th edn, 2015, garland science.

Genetics: A molecular approach by peter j. Russell. 3rd edn, 2010, person education, inc.,

Genetics by verma and Agarwal.chand publications.

Genetics by gardner, simmons and snustad. 2004. John wiley & sons

Course Code	Course Title	L	T	P	C
19117AEC24L	Cell biology and genetics Lab	0	0	3	2

Aim:

- To enable students to learn the basics of prokaryotic and eukaryotic cells

Objectives:

- To develop practical biological skills such as staining, sterilization, dialysis etc.
- To prepare students for subsequent biological courses that require an understanding of the physiology of organisms such as cell division, enzyme activity etc.

Outcomes:

- Able to isolate the DNA, identify and distinguish different blood cells, to solve simple genetic problems and analyze Human karyotype
- The course teaches the students about genes at molecular level
- They learn about DNA, RNA and their replication, mutations, DNA repair mechanism

EX:

- Mitosis in onion root
- Meiosis in flower bud
- Normal human karyotyping
- preparation of polytene chromosome
- Isolation of chloroplast from spinach leaves
- Isolation of protoplast
- Life cycle of *Drosophila*
- Culturing techniques and handling of flies

ENTREPRENEURSHIP

REFERENCE:

1. Experimental procedures in Life Sciences, S.Rajan and R. Selvi Christy, 2010, Anjanaa book house.

Course Code	Course Title	L	T	P	C
19116AEC25	Microbiology	5	0	0	5

Aim:

- Students will understand the cellular components underlying microbial cell division.

Objectives:

- To impart knowledge on classification of microbes, function and biochemical reaction going on inside the microbial cell.

Outcomes:

- This fundamental paper discusses the importance of microorganisms
- The course throws light on types of microorganisms in and around humans
- At the end of the course, the student has understanding on the metabolism and mechanism of microbial life

Unit I

(12 Hrs)

Overview of history of Microbiology - Biogenesis and abiogenesis Contributions of Redi, Spallanzani, Needham, Pasteur, Tyndal, Joseph Lister, Koch [Germ Theory], Edward Jenner and Fleming [Penicillin], Scope of Microbiology, Classification of Microbes - Nutritional types [Definition and examples]. Classification on the basis of oxygen requirement.

Unit II

(12 Hrs)

Ultrastructure and characteristics of bacteria, fungi, algae, and protozoans. Microbes in Extreme Environment – thermophilic, methanogenic and halophilic. Archaea - live in extreme conditions like cold, and space. Beneficial aspects of microorganisms.

Unit III

(12 Hrs)

Pathogenic Microorganisms – List of common bacterial, fungal and viral diseases of human beings [Name of the disease, causative pathogen, parts affected], Concept of Sterilization - Definition of sterilization, dry and moist heat, pasteurization, tyndalization; radiation, ultrasonication, filtration. Physical and Chemical methods of sterilization; disinfection sanitization, antiseptics sterilants and fumigation.

Unit IV**(12 Hrs)**

Stains and staining techniques - Definition of auxochrome, chromophores, dyes, Classification of stains, Theories of staining, Mechanism of gram staining, acid fast staining, negative staining, capsule staining, flagella staining, endospore staining, Fungal staining.

SKILL DEVELOPMENT**Unit V****(12 Hrs)**

Basic concepts of Virology - General characteristics of viruses, differences between bacteria and viruses. Classification of viruses. Ultrastructure of TMV and Bacteriophage.

REFERENCE:

- Microbiology M.J.Pelczar E.C.S.Chan and N.R.Crick. 2007.Me Graw Hill

**Skill Based Elective-II
MS-EXCEL**

Course Code	Course Title	L	T	P	C
19120SEC02AL	Package Lab-II	0	0	2	1

Outcome:

- Indicate the names and functions of the Excel interface components.
- Enter and edit data
- Format data and cells.
- Construct formulas, including the use of built-in functions, and relative and absolute references.
- Create and modify charts
- Preview and print worksheets.

Ex

1. Prepare the addressing methods in excel
2. Describe the type of function
3. Draw a graph by using your own data
4. Prepare an Individual Pay Bill preparation for a employee in an organization.
5. Prepare a Mark list preparation for a student.
6. Prepare a Worksheet preparation for a company.
7. Prepare a Inventory Preparation
8. Prepare a Electricity Bill Preparation

SKILL DEVELOPMENT

Course Code	Course Title	L	T	P	C
19160SEC02B	SOFT SKILL II	0	0	2	1

Part-II Self Development

Outcome:

Build self-development

UNIT I: Self-Assessment

Self-Assessment, Self-Awareness, Self-Esteem, Personal success factors, handling failure, Depression and Habit, Self-appraisal, SWOT analysis Perceptions and Attitudes, Positive Attitude, Values and Belief Systems, Personal Goal setting, Career Planning, Building of Self Confidence, prioritization.

UNIT II: Self-Management

Managing Time, Managing Stress, Conflict Management

Course Code	Course Title	L	T	P	C
19111SEC02L	Communicative English lab -II	0	0	2	1

Aim:

- To acquaint with the basic grammar

Objective:

- To learn about the auxiliary and the modals
- To understand the different tenses and use it in sentences
- To know where to use and where not to use the articles
- To familiarize with the participle

Outcome:

- Learn grammar
- Use a variety of reading strategies
- Enhance the skill of making grammatically correct sentences.
- Achieve one's goal by following the ancestral path

UNIT -I

Auxiliaries

UNIT -II

Modals

UNIT -III

Tenses-Simple, Perfect

UNIT -IV

Tenses-Continuous, Perfect continuous

UNIT -V

Articles

Participle

Reference

A Practical English Grammar
English Grammar

-A.J Thomson and A.V.Martinet
-Wren and Martin

SEMESTER - III

Semester	Subject Code	Title of the Course
III	1910AEC31	ശൈത്യ - ജന്മകാലം, പ്രാർത്ഥന, പ്രാർത്ഥന പ്രാർത്ഥന, പ്രാർത്ഥന

പാഠ്യ-1

ശൈത്യ-
ജന്മകാലം -
പ്രാർത്ഥന

പ്രാർത്ഥന
പ്രാർത്ഥന, പ്രാർത്ഥന
പ്രാർത്ഥന 10 ന.കാലം

പാഠ്യ-2

ശൈത്യ-
ജന്മകാലം

ശൈത്യ-
ജന്മകാലം, പ്രാർത്ഥന
പ്രാർത്ഥന

പാഠ്യ-3

ശൈത്യ-
ജന്മകാലം

പ്രാർത്ഥന, പ്രാർത്ഥന
പ്രാർത്ഥന

പാഠ്യ-4

ശൈത്യ-
ജന്മകാലം

പ്രാർത്ഥന

പാഠ്യ-5

ശൈത്യ-
ജന്മകാലം, പ്രാർത്ഥന
പ്രാർത്ഥന, പ്രാർത്ഥന
പ്രാർത്ഥന, പ്രാർത്ഥന

Course Code	Course Title	L	T	P	C	Marks
19111AEC31	Advanced English-III	4	0	0	2	100

Aim:

- To improve the knowledge of English

Objective:

- To familiarize with the organs of speech and the description and classification of speech sounds
- To understand consonant cluster, syllable, word accent and intonation.
- To know how to interpret graphics
- To write slogans and advertisements

Outcome:

- Understand phonetics.
- Develop writing skill
- Able to develop creative writing

UNIT – I

The organs of speech
 Classification of speech sounds
 Vowels and Diphthongs

UNIT – II

Consonants
 Consonant cluster

UNIT – III

Syllable
 Word accent

Intonation

UNIT – IV

Idiom
 Interpretation of graphics

UNIT – V

Slogan writing
 Writing advertisement

References:

English Grammar -Wren and Martin
 English Grammar and Composition -Radhakrishna Pillai
 Technical Communication -Meenakshi Sharma & Sangeetha Sharma
 A text book of Phonetics for Indian Students -T.B. Balasubramaniyan

Course Code	Course Title	L	T	P	C
19111AEC32	English-III	4	0	0	2

Aim:

- To acquaint students with learning English through literature

Objective:

- To sensitize students to language use through prescribed text
- To develop the conversational skills through one act plays

Outcome:

- Enable to appreciate different types of prose
- Develop the conversational skills through one-act plays
- Enhance the skill of making grammatically correct sentences.

UNIT – I

The Doctor's World	- R.K. Narayan
The Postmaster	- Rabindranath Tagore
Princess September	- E. Somerest Maugham

UNIT – II

The Price of Flowers	- Prabhat Kumar Mukhopadhyay
The Open Window	- Saki
The Model Millionaire	- Oscar Wilde

UNIT – III

My Brother My Brother	- Norah Burke
Uneasy Home Coming	- Will F. Jenkins
Resignation	- Prenchand

UNIT – IV

The Referee	- W.H. Andrews & Geoffrey Dreamer
The Case of the Stolen Diamonds	- Farrell Mitchell

UNIT – V

The Dear Departed	- Stanley Houghton
The Princess and the Wood Cutter	- Alan Alexander Milne

References:-

Nine Short Stories	- Stuart H. King Blackie Books
One-Act plays of Today	- T. Prabhakar Emerald Publishers

Course Code	Course Title	L	T	P	C
19117AEC33	Plant physiology	5	0	0	5

Aim:

- Understand the interaction between the environment and plant growth and development

Objective:

- understand the relationship between structure and function as it relates to plant macromolecules, cells, and tissues
- Gain an appreciation of the metabolic and physiological processes unique to plants

Outcome:

- Impart an insight into the various plant water relations
- learning about the mineral nutrition in plants
- Understand the mechanism of various metabolic processes in plants
- Understand the respiration in higher plants with particular emphasis on aerobic and anaerobic respiration.

UNIT – I

Properties of water, Water potential, Osmotic potential and stomatal physiology. Uptake, transport and translocation of water, ions through cells, xylem and phloem. Transpiration and anti-transpirants. Solute transport. Ascent of sap.

UNIT-II

Mineral nutrition – deficiency symptoms, mineral salt absorption mechanism, Ion exchange theory and cytochrome-pump hypothesis, factors affecting salt absorption

UNIT-III

Principles of light absorption, energy transfer and electron transfer; CO₂ fixation - C₃, C₄ and CAM pathway, Mechanism of Photosynthesis, Respiration; Glycolysis, TCA cycle Electron transport system and Photorespiration, Bioluminescence,

UNIT-IV

Application of Auxins, Gibberellins, Ethylene and Abscisic acid in agriculture. Biological Nitrogen fixation, Nitrogen cycle, nif gene. Structure and function of Phytochrome, Photoperiodism and Biological clocks.

SKILL DEVELOPMENT

UNIT-V

Stress physiology-definition and types, Physiological responses to biotic and abiotic stresses, Mechanism of resistance to biotic stress and tolerance to abiotic stress.

REFERENCES:

- Salisbury, Frank B. & Ross, Cleon W. (1992). Plant physiology, 4th, Belmont, California: Wadsworth Publishing.
- Panday SN and Sinha B K. 1989. Plant physiology. Vikas Publishing House Pvt. Ltd, New Delhi
- devlin, R. M. and Baker 1973. Photosynthesis, Reinhold Affiliated East-West Press Pvt.Ltd, New Delhi.
- Hewitt, E.J. and cutting, C.V. 1979. Nitrogen metabolism of plants, Academic Press, London.

Course Code	Course Title	L	T	P	C
19117AEC34L	Plant physiology Lab	0	0	3	3

Aim:

- Student identify and assess viability of cells by microscopic examination.

Objectives:

- Identify the problems associated with growing, storing and identifying a wide range of different cell types.
- Analyze data using appropriate techniques.

Outcomes:

- Equip students with skills and techniques related to plant physiology so that they can design their own experiments
- Learn about the movement of sap and absorption of water in plant body.
- Understand the plant movements

EX:

- To demonstrate the ascent of sap takes place by xylem (Ringling experiment)
- To demonstrate the phenomenon of Transpiration
- To find out Transpiration and Absorption ratio (T/A)
- To measure the rate of transpiration by using Ganong's potometer
- To demonstrate the oxygen is liberated in the process of photosynthesis
- To demonstrate the CO₂ and light is essential for photosynthesis (Moll's half leaf experiment)

SKILL DEVELOPMENT

REFERENCES:

- L. Taiz and E. Zeiger. 2007. *Plant Physiology*. 4th ed. Sinauer Associates, Inc
- Hopkins and N. P. A. Huner. 2009. *Introduction to Plant Physiology*. 4th ed. John Wiley & Sons, Inc.
- B. B. Buchanan, W. Gruissem, and R. L. Jones. 2000. *Biochemistry and Molecular Biology of Plants*. John Wiley & Sons, Inc

Course Code	Course Title	L	T	P	C
19117AEC35	Immunology	4	0	0	4

Aim:

- To learn the immune system and reaction

Objectives:

- To expose the students with the immune system of human body

Outcomes:

- The students may understand the immune system, its components and various techniques used in bio manipulation.
- This course gives an overview on the immune system including organs, cells and receptors
- The students learn about molecular basis of antigen recognition, hypersensitivity reaction, antigen-antibody reactions
- The course develops in the student an appreciation for principles of immunology and its applications in treating human diseases

Unit I

Introduction, Lymphocytes, their origin and differentiation, antigens, their structure and classification, complement and their biological functions, types of immune responses, anatomy of immune response.

Unit II

B-Lymphocytes and their activation, structure and function of immunoglobulin, immunoglobulin classes and subclasses, genetic control of antibody production, mono-clonal antibodies and diagnosis, idiotype and antibodies, major histocompatibility complex.

Unit III

Thymus derived Lymphocytes (T Cells) their classification antigen presenting cells (APC), macrophages, Langerhans cells, their origin and function, mechanisms of phagocytosis, identification of cell types of immune system, immunosuppression.

Unit IV

Hypersensitivity reactions, mechanisms of T cell activation, cytokines and their role in immune response macrophage activation and granuloma formation.

Unit V

Graft rejection, evidence and mechanisms of graft rejection, prevention of graft rejection, immunosuppressive drugs, HLA and disease, mechanisms of immunity to tumor antigens.

EMPLOYABILITY

REFERENCES:

- Immunology by I.J. Kubcy 1991 Freseman and company.
- Essential immunology Ivan Roitt, 1994. Blackwell Scientific publisher.

Oxford.

Course Code	Course Title	L	T	P	C
19117AEC36L	Immunology Lab	0	0	3	3

Aim:

- To enable students to learn the basics of immunological techniques

Objectives:

- To impart knowledge on the immune system and characterization of immune aspects

Outcomes:

- Identify the structure, function, and characteristics of immunoglobulins.
- Explain the principles of and perform serological tests.
- It's a paper which accomplishes the learning of techniques involved in understanding the immunological aspects of physiology and biological samples

EX:

1. To determine total platelet count
2. To perform PT
3. To perform APTT
4. To perform thrombin time
5. Determination of hemoglobin by various methods.
6. Determination of Total RBC count.

EMPLOYABILITY

REFERENCES:

1. Experimental procedures in Life Sciences, S.Rajan and R. Selvi Christy, 2010, Anjanaa book house.
2. Biochemical methods II Edition Sadasivam, A. and Manickam, A. New age International P Ltd. Publishers.

Course Code	Course Title	L	T	P	C
19117RMC37	Research Methodology	3	0	0	3

AIM:

To create a basic appreciation towards research process and awareness of various research publication

OBJECTIVES:

- To understand the steps in research process and the suitable methods.
- To identify various research communications and their salient features
- To carry out basic literature survey using the common data-bases
- To give exposure to MATLAB platform for effective computational and graphic works required for quality research

OUTCOME:

- Understanding research questions and tools
- Experience in scientific writings
- Practice in various aspects of scientific publications
- Inculcation of research ethics

PREREQUISITES:

Basic computer literacy & skills for working in window-environment

UNIT I: Introduction to Research Methodology

Meaning of research – Objectives of research – Types of research – Significance of research – Research approaches

UNIT II: Research Methods

Research methods versus methodology – Research and scientific method – Criteria of good research – Problems encountered by researchers in India.

UNIT III: Literature Survey

Articles – Thesis – Journals – Patents – Primary sources of journals and patents – Secondary sources – Listing of titles – Abstracts – Reviews – General treatises – Monographs.

UNIT IV: Database Survey

Database search – NIST – MSDS – PubMed – Scopus – Science citation index – Information about a specific search.

UNIT V:

Basic Principles of Laboratory life science laboratory

Introduction - Access to Laboratory and Emergency Exits – Basic biostatistics, mean, median, mode and its application – fundamental of biosafety, bioethics, replication – advantages and disadvantages, standard deviation, standard error, preparation of chemicals – percentage, molarity and normality, ratio solution, PPM solution etc. ethical issue in animal handling, basic of DMRT, ANOVA etc.

Skill Based Elective-III

Course Code	Course Title	L	T	P	C
19120SEC03AL	Package Lab-III	0	0	2	1

Outcome:

- Identify the names and functions of the PowerPoint interface.
- Create, edit, save, and print presentations
- Format presentations
- Add a graphic to a presentation.
- Create and manipulate simple slide shows with outlines and notes.
- Create slide presentations that include text, graphics, animation, and transitions

EX:

1. Create a slide show presentation for a seminar (choose your own topics)
 - a. Enter the text in the outline view
 - b. Create Non-bulleted and bulleted text
2. Create a slide show presentation for a science exhibition
 - a. Create Non-bulleted and bulleted text
 - b. Apply appropriate text attributes
3. Create slide show presentation for an invitation
 - a. Insert an object from a bitmap file
 - b. Apply appropriate text attributes
 - c. Rotate the object to 45 degrees
 - d. Apply shadow to the object
4. Create a slide show presentation to display percentage of marks in each semester for all students
 - a. Use bar chart (x-axis: semester; y-axis: % of marks)
 - b. Use different presentation template and different transition effect for each slide
 - c. Use different text attributes in each slide
5. *Create a slide show presentation for a shop advertisement to be open shortly*
6. Create a slide show presentation to display percentage of sales in each quarter for the any vendor using bar chart (x-axis: Quarter; y-axis: % of sales)
7. Create a slide show presentation for a tourist's places
8. Create a slide for calendar using appropriate text attributes and insert an object from a bitmap file

Course Code	Course Title	L	T	P	C
19160SEC03B	SOFT SKILL III	0	0	2	1

Part -III Interpersonal Relations and Social Responsibilities

Outcome:

- Learn interpersonal relations and social responsibilities.

UNIT I: Interpersonal Relations

Nature of groups and teams, Team effectiveness, Group discussions and decision making, Emotional Intelligence (EI) and Emotional Quotients (EQ), and its effect on team, Cross Cultural Aspects, Inter dependence, Peer Reviews.

UNIT II: Ethics and Social Responsibilities

Personal professional and corporate ethics, Ethical dilemma, Corporate social responsibilities: green computing, social accounting, Auditing, Civic sense.

Course Code	Course Title	L	T	P	C
1911ISEC03L	Communicative English lab -III	0	0	2	1

Aim:

- To acquaint with the basic grammar

Objective:

- To familiarize with the clauses and phrases
- To learn the different degrees of comparison
- To change a sentence from active to passive and vice versa
- To know where to use punctuations
- To frame sentences
- To know the features, process, forms and barriers of communication

Outcome:

- Learn grammar
- Enhance their fluency in English
- Develop speaking and writing skills
- Develop individual perspectives that demonstrate critical thinking skills

UNIT -I

Clauses

Phrases

UNIT -II

Degrees of comparison

UNIT -III

Active and Passive

UNIT -IV

Communication

Characteristics -Process -Forms - Barriers

UNIT -V

Punctuation

Forming sentences

References: -

A Practical English Grammar

English Grammar

Technical Communication

-A.J Thomson and A.V. Martinet

- Wren and Martin

-Meenakshi Sharma & Sangeetha Sharma

SEMESTER - IV

Semester	Subject Code	Title of the Course
IV	17110AEC41	செயல்-சின் இலக்கியம்,இலக்கணம்,இலக்கிய வரலாறு- மலர்.ம.ப பகுதி

பகுதி-I

அ. இலக்கணம்
பகுதி - குறிஞ்சி 356,முல்லை-242, மலை-397
தமிழ்நாடு - 2,18,25,38,67,89,133,167,283,373
பகுதி - சிறுவர் கல்விப் பகுதி

பகுதி-II

அ. இலக்கணம் - மலை 34,குறிஞ்சி-51,முல்லை-111
பகுதி - 36,147,332
பகுதி - 34,173,189,233,270

பகுதி-III

முல்லைமலர் - மதுரை
சிறுவர் - சிறு வகுப்புகள்
பகுதி 2,முல்லை 2,இலக்கியம் -1 அங்குலம்,அருங்குலம்,இலக்கியம்,ச.க.நி.ப.பகுதி,பகுதி

பகுதி-IV

இலக்கணம் அம்

மலர்.ம.ப பகுதி

பகுதி-V

இலக்கிய வரலாறு
அ. இலக்கணம்
பகுதி.ச
அ.இலக்கணம்

Course Code	Course Title	L	T	P	C
19111AEC41	Advanced English-IV	4	0	0	2

Aim:

- To improve the knowledge of English

Objective:

- To familiarize with the objectives and types of interviews
- To know the types of questions and answering techniques
- To prepare reviews and proposals
- To learn the grammatical forms
- To understand the meaning of a poem and write the content
- To write for and against a topic
- To draw a flowchart
- To write definitions

Outcome:

- Develop writing skill.
- Comprehend and describe poems
- Learn interviewing skills

UNIT -I

Interviews

Objectives, types, ten success factors, ten failure factors - Planning and preparation -

Presentation- Type of questions - Answering techniques

UNIT - II

Flowchart

Proposals

UNIT - III

Discourse markers

Review

UNIT IV

Grammatical forms

Paraphrasing

UNIT -V

Definition

Writing for and against a topic.

SKILL DEVELOPMENT

References:

- | | |
|--------------------------------------|--|
| English Grammar | -Wren and Martin |
| English Grammar and Composition | -Radhakrishna Pillai |
| Essentials of Business Communication | -Rajendra Pal & J.S Korlahalli Sultan Chand & Sons |
| Technical Communication | -Meenakshi Sharma & Sangeetha Sharma |
| English for writers and translators | -Robin Macpherson |
| English Work Book-I&II | -Jewelcy Jawahar |

Course Code	Course Title	L	T	P	C
19111AEC42	English-IV	4	0	0	2

Aim:

- To acquaint students with learning English through literature

Objective:

- To introduce learners to the standard literary texts
- To impart wisdom through morally sound poems and essays
- To introduce Shakespeare to non-literature students

Outcome:

- Improve their ability to read and understand them
- Know the genius of Shakespeare
- Express in writing their views.

UNIT -I

How to be a Doctor	-Stephen Leacock
My Visions for India	-A.P.J. Abdul Kalam
Woman, not the weaker sex	-M.K. Gandhi

UNIT -II

My Last Duchess	-Robert Browning
The Toys	-Coventry Patmore
I, too	-Langston Hughes

UNIT -III

The Best Investment I ever made	-A.J.Cronin
The Verger	-W.S Maugham
A Willing Slave	-R.K.Narayan

UNIT -IV

Macbeth
As You Like It

UNIT -V

Henry IV
Tempest

SKILL DEVELOPMENT

References: -

English for Enrichment -Devaraj Emerald Publishers
Selected Scenes from Shakespeare Book I &II -Emerald Publishers

Course Code	Course Title	L	T	P	C
19117AEC43	Animal physiology	6	0	0	6

Aim:

- To be able to read, interpret and discuss scientific journal articles in physiology.

Objectives:

- To provide advanced undergraduate and introductory graduate students with a comprehensive overview of animal physiology from molecular, cellular and whole animal systems approaches.
- To critically evaluate clinical and research case problems relating to endocrinology and cell biology.

Outcomes:

- Understand the physiological processes that regulate body functions and the regulation of an organ system from the molecular all the way to the whole animal level
- understanding the more complicated structures and processes in mammals and humans
- It's a paper which accomplishes the learning of techniques involved in understanding the immunological aspects of physiology and biological samples.
- To know the importance of phagocytosis and natural killer cells in innate body defense.

UNIT I

Respiration: Availability of oxygen- respiratory organs in animals- properties and functions of respiratory pigments- regulation of respiration

UNIT II

Circulation: types of hearts- composition and functions of blood- cardiac rhythm- cardiac output- ECG- blood pressure- electrical activity and properties of heart- regulation of cardiovascular function.

UNIT III

Coordination (neuromuscular and neuroendocrine): Nerve impulse conduction- ultrastructure of muscle – theories of muscle contraction

UNIT IV

Excretion: structure and functions of different excretory organs in animals- mechanism of urine formation in man

EMPLOYABILITY/ENTREPRENEURSHIP/SKILL DEVELOPMENT

UNIT V

Homeostasis: Significance- mechanism of osmo-ion regulation in fresh water, estuarine and marine fishes.

REFERENCES:

- Human Physiology, Stuart Fox, 11th ed., McGraw Hill
- Linda Costanzo's "Physiology- Board Review Series (5th Ed.)" Lippincott Williams & Wilkins.

Course Code	Course Title	L	T	P	C
19117AEC44L	Animal physiology Lab	0	0	3	3

Aim:

- To develop further practical biological skills introduced in 1A Physiology of Organisms

Objective:

- To provide a course of study in mammalian, principally human, systems physiology, building on knowledge of basic physiological principles established in the Part 1A Physiology of Organisms course

Outcome:

- Have an enhanced knowledge and appreciation of mammalian physiology
- Understand the functions of important physiological systems including the cardiorespiratory, renal, reproductive and metabolic systems
- It trains the students with essentiality of molecules, cells, tissues and organs involved in the defense mechanism

EX:

1. Microscopy
2. WDC count
3. Differential leucocyte count by Leishman's staining
4. Estimation of Hemoglobin by Sahli's acid haematin method
5. Determination of Packed cell volume (PCV)
6. Determination of Erythrocyte sedimentation rate (ESR)
7. Determination of Coagulation time & bleeding time
8. Determination of blood group
9. Determination of Blood Pressure by Sphygmomanometer

EMPLOYABILITY/ENTREPRENEURSHIP/SKILL DEVELOPMENT

REFERENCES

G.K.Pal & P. Pal. 2006. Textbook of Practical Physiology. 2nd Edn. Orient Blackswan.

Course Code	Course Title	L	T	P	C
19117AEC45	Bioinformatics and Biostatistics	6	0	0	6

Aim:

- Know the theory behind fundamental bioinformatics analysis methods.
- Be familiar with widely used bioinformatics databases.

Objective:

- The course is aimed at introducing the students to the field of Bioinformatics and enable them understand the concepts of statistics in biology.

Outcome:

- Know the applications and limitations of different bioinformatics and statistical methods.
- Be able to perform and interpret bioinformatics and statistical analyses with real molecular biology data.
- Be able to describe statistical methods and probability distributions relevant for molecular biology data.

UNIT I

Introduction to bioinformatics- scope and applications- characteristics of hardware and software- types of computers- computer network- sending and receiving email- searching biological articles in net.

UNIT II

Uses of databases in biology- sequence databases- structural databases- tools for analysis- BLAST, FASTA, CLUSTAL W, Database organizations- NCBI, EMBL, DDBJ

UNIT III

Sequence analysis of proteins/ nucleic acids- structural comparisons- molecular modeling

UNIT IV

Applications of statistics in biology- measures of central tendency- mean, median and mode- measures of dispersion- standard deviation and standard error

UNIT V

Test of significance- student's t test, chi square test, Correlation and its types

EMPLOYABILITY/ENTREPRENEURSHIP/SKILL DEVELOPMENT

REFERENCES:

- Introduction to Biostatistics by Sokal and Rohlf, 1973, Toppan Co. Japan.
- Molecular databases for protein sequence and structure studies by J.A. Sillince and M. Sillince, 1991, Springer International.

Course Code	Course Title	L	T	P	C
19117AEC46L	Bioinformatics and Biostatistics Lab	0	0	3	3

Aim:

- To enable students to learn the basics of Bioinformatics and Biostatistics techniques

Objective:

- To impart practical exposure upon Bioinformatics tools and databases.

Outcome:

- This laboratory course will prepare the students for various applications of bioinformatics in life science research.
- The student will be able to apply basic principles of biology, computer science and mathematics to address complex biological problems
- This course imparts the knowledge of basic statistical methods to solve problems

EX:

- Study of Internet resources- databases NCBI, EMBL, DDBJ
- Sequence analysis using BLAST
- Multiple Sequence alignment using CLUSTAL W
- Primer designing
- Mean, median and mode in biological samples- leaves
- Correlation analysis- length- weight relationship in fishes

ENTREPRENEURSHIP

Skill Based Elective IV
MS-ACCESS

Course Code	Course Title	L	T	P	C
19120SEC04AL	Package Lab-IV	0	0	2	1

Outcome:

- Examine database concepts and explore the Microsoft Office Access environment.
- Design a simple database.
- Build a new database with related tables.
- Manage the data in a table
- Query a database using different methods.
- Design a form.
- Generate a report.
- Import and export data.

EX:

1. Create a database and a simple table
2. Create a database for sorting the marks scored by the student in the universality exams
3. Create a database for sorting the date of joining by the employee in the organization.
4. Create queries to select records that matches specific condition
5. Create relationships among the different tables
6. Create queries using built-in functions
7. Develop forms to enter data in to the student marks database
8. Develop forms to enter data in to the employee database

Course Code	Course Title	L	T	P	C
19160SEC04B	SOFT SKILL IV	0	0	2	1

PART -IV Etiquette and Interviewing Skills

Outcome:

- Develop etiquette and interviewing skills.

UNIT I Corporate

Corporate grooming and dressing, Etiquettes in social as well as office settings, Email Etiquettes, Telephone Etiquettes, Contemporary issues in corporate life: diversity, Attrition, Work life balance, Hygiene and health.

UNIT II Interviewing Skills

Researching the job-Researching the company -Questions to research the company- Informational Interviews-Behavioral interviewing- Types of interviews (Individual interviews, panel interviews, serial interviews, video interviews and teleconferencing) references-selling yourself-dressing for success-body language-stress reduction-Handling illegal questions.

Course Code	Course Title	L	T	P	C
19111SCE04L	Communicative English lab -IV	0	0	1	1

Aim:

- To develop communicative skills

Objective:

- To use gerund and make sentences
- To change sentences from direct to indirect and vice versa
- To understand the listening skill
- To enhance reading skill
- To familiarize with the singular and plural forms
- To describe a picture

Outcome:

- Learn grammar
- Enable to express their views in conversation
- Develop soft skills
- Enhance presentation skills

UNIT -I

Gerund

Infinitive

UNIT -II

Direct and Indirect

UNIT -III

Listening -types-features of a good listener-active and passive listening-effective listening

UNIT -IV

Reading-purpose-technique-types-reading rates-reading & interpretation

UNIT -V

Singular and Plural

Letter writing

References: -

A Practical English Grammar

English Grammar

Technical Communication

-A.J.Thomson and A.V. Martinet

-Wren and Martin

-Meenakshi Sharma & Sangeetha Sharma

ENVIRONMENTAL STUDIES

(For under graduate students)

Course Code	Course Title	L	T	P	C
191ENVTSTU	Environmental Studies	1	0	0	1

Aim:

- To motivate for participation in environment protection and improvement.

Objectives:

- Creating the awareness about environmental problems among people.
- Imparting basic knowledge about the environment and its allied problems.
- Developing an attitude of concern for the environment.
- Motivating public to participate in environment protection and environment improvement.
- Acquiring skills to help the concerned individuals in identifying and solving environmental problems.
- Striving to attain harmony with Nature.

Outcomes:

- Learn about environmental pollution.
- Familiarize with the social issues and the environment

1. Nature of Environmental Studies

Definition, scope and importance.

Multidisciplinary nature of environmental studies

Need for public awareness.

2. Natural Resources and Associated Problems.

- a) Forest resources: Use and over — exploitation, deforestation, dams and their effects on forests and tribal people.
- b) Water resources: Use and over — utilization of surface and ground water, floods, drought, conflicts over water, dam's benefits and problems.
- c) Mineral resources: Usage and exploitation. Environmental effects of extracting and using mineral resources.
- d) Food resources: World food problem, changes caused by agriculture effect of modern agriculture, fertilizer — pesticide problems.
- e) Energy resources: Growing energy needs, renewable and none — renewable energy resources, use of alternate energy sources. Solar energy, Biomass energy, Nuclear energy.
- f) Land resources: Solar energy, Biomass energy, Nuclear energy, Land as a resource, land degradation, man induced landslides, soil erosion and desertification.

Role of an individuals in conservation of natural resources.

3. Ecosystems

Concept of an ecosystem.

Structure and function of an ecosystem.

Producers, consumers and decomposers.

Energy flow in the ecosystem.

Ecological succession.

Food chains, food webs and ecological pyramids.

Introduction, types, characteristics features, structure and function of the following ecosystem:

a) Forest ecosystem, b) Grassland ecosystem, c) Desert ecosystem,

d) Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries).

4. Biodiversity and its conservation

Introduction — Definition: genetic, species and ecosystem diversity.

Bio — geographical classification of India.

Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values.

India as a mega — diversity nation.

Western Ghat as a biodiversity region.

Hot — spot of biodiversity.

Threats to biodiversity habitat loss, poaching of wildlife, man — wildlife conflicts.

Endangered and endemic species of India.

Conservation of biodiversity: In — situ and Ex — situ conservation of biodiversity.

5. Environmental Pollution

Definition: Causes, effects and control measures of: Air pollution, Water pollution, soil pollution, Marine pollution, Noise pollution, Thermal pollution, nuclear hazards.

Solid waste Management: Causes, effects and control measures of urban and industrial wastes. Role of a individual in prevention of pollution.

6. Social Issues and the Environment

Disaster management: floods, earthquake, cyclone, tsunami and landslides.

Urban problems related to energy Water conservation, rain water harvesting, and watershed management

Resettlement and rehabilitation of people; its problems and concerns.

Environmental ethics: Issue and possible solutions.

Global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust.

Wasteland reclamation.

Consumerism and waste products.

7. Environmental Protection

From Unsustainable to Sustainable development.

Environmental Protection Act.

Air (Prevention and Control of Pollution) Act.

Water (Prevention and control of Pollution) Act.

Wildlife Protection Act.

Forest Conservation Act.

Population Growth and Human Health, Human Rights.

8. Field Work

Visit to a local area to document environmental assets — River / Forest / Grassland / Hill / Mountain,

or

Visit to a local polluted site — Urban / Rural / Industrial / Agricultural,

or

Study of common plants, insects, birds,

or

Study of simple ecosystems — ponds, river, hill slopes, etc.

References:

- 1) Agarwal, K.C., 2001, Environmental Biology, Nidi Pub. Ltd., Bikaner.
- 2) Bharucha Erach, the Biodiversity of India, Mapin Publishing Pvt. Ltd., Ahmedabad 380013, India, Email: rn4pin@icenet.net (R)
- 3) Brunner R.C., 1989, Hazardous Waste Incineration, McGraw Hill Inc. 480p
- 4) Clank R.S., Marine Pollution, Clarendon Press Oxford (TB)
- 5) Cunningham, W.P. Cooper, T.H. Gorhani, E. & Hepworth, M.T.2001, Environmental Encyclopedia, Jaico Pub. Mumbai, 1196p
- 6) De A.K., Environmental Chemistry, Wiley Western Ltd.
- 7) Down to Earth, Centre for Science and Environment, New Delhi. (R)
- 8) Gleick, H., 1993, Water in crisis, Pacific Institute for studies in Dev. Environment & Security. Stockholm Env Institute. Oxford Univ. Press 473p
- 9) Hawkins R.E., Encyclopedia of Indian Natural History, Bombay Natural History Society, Bompay (R)
- 10) Heywood, V.K. & Watson, R.T.1995, Global Biodiversity Assessment, Cambridge Univ. Press 1140 p.
- 11) Jadhav, H. and Bhosale, V.J. 1995, Environmental Protection and Laws, Himalaya Pub. House, Delhi 284p.
- 12) Mickinney, M.L. and School, R.M. 1196, Environmental Science Systems and Solutions, Web enhanced edition, 639p.
- 13) Miller T.G. Jr. Environmental Science. Wadsworth Publications Co. (TB).
- 14) Odum, E.P. 1971, Fundamentals of Ecology, W.B. Saunders Co. USA, 574zp.
- 15) Rao M.N. and Dana, A.K. 1987, Waste Water Treatment, Wxford & IBH Publ. Co. Pvt. Ltd., 345p
- 16) Sharma B.K., 2001, Environmental Chemistry, Gokel Publ. Hkouse; Meerut
- 17) Survey of the Environment, the Hindu (M)
- 18) Townsend C., Harper, J. and Michael Begon, Essentials of Ecology, Blackwell Science (TB)
- 19) Trivedi R.K. Handbook of Environmental Laws, Rules, Guidelines, Compliances and Standards, vol. I and II, Environmental Media (R)
- 20) Trivedi R.K. and P.K. Goel, Introduction to air pollution, Techno— Science Publications (TB)
- 21) Wagner K.D., 1998, Environmental management, W.B. Saunders Co. Philadelphia, USA 499p.
- 22) Paryavaran shastra — Gholap T.N,
- 23) Paryavaran Sahastra — Gharapure
(M) Magazine
(R) Reference
(TB) Textbook

SEMESTER V

Course Code	Course Title	L	T	P	C
19117AEC51	Developmental biology	5	0	0	5

Aim:

- Developmental biology studies the genetic control of cell growth, differentiation and "morphogenesis," which is the process that gives rise to tissues, organs and anatomy.

Objectives:

- Understand the significance of nature using scientific methods.
- Understand the origin and evolution of biotic community

Outcomes:

- Be able to list the types of characteristics that make an organism ideal for the study of developmental biology
- Be familiar with the events that led up to and comprise the process of fertilization.
- Be able to compare and contrast the process of gastrulation in the various model organisms discussed

UNIT-I:

A brief historical account, microsporangium and male gametophyte-structure and development; incompatibility-types, mechanism and methods to overcome incompatibility, Megasporogenesis, development of female gametophyte (3 types).

UNIT-II:

Organization and ultra-structure of mature embryo sac, nutrition. Fertilization - germination of pollen, path of pollen tube; Endosperm – types and function; embryogenesis-development of a typical monocot and dicot embryo, polyembryony

UNIT III

Germ cell: structure of sperm and egg (human) - types of eggs- egg membranes- egg organization- role of pituitary and other related endocrines in gametogenesis

UNIT IV

Fertilization: mechanics- physiology- theories and development- experimental work in fertilization- biochemical changes during fertilization

UNIT-V

Cleavage and gastrulation: General principles- outlines of physiology- comparative account in frog, chick and man- embryonic adaptations

EMPLOYABILITY/ENTREPRENEURSHIP/SKILL DEVELOPMENT

REFERENCES:

- Balinsky- Text book of embryology
- Nelson- comparative vertebrate embryology
- Berril- Developmental Biology

Course Code	Course Title	L	T	P	C
19117SEC52	Cell and tissue culture	5	0	0	5

Aim:

- To develop and standardize protocols for the in vitro propagation from ex vitro explants

Objectives:

- To optimize the culture conditions for rapid propagation to increase the biomass production
- Optimization of medium and culture conditions for the enhancement of active principle production by different approaches

Outcomes:

- Fundamentals of plant tissue culture. Plant regeneration and organogenesis. Embryogenesis, Organ, anther and pollen culture. Ovary, ovule and embryo culture. Callus-suspension culture.
- Protoplast, isolation, culture and fusion.
- Production of hybrids and cybrids.

UNIT I

History of plant cell, tissue and organ culture- laboratory organization- aseptic techniques- nutritional requirement

UNIT II

Culture media- types of culture- solid- liquid- stationary- agitated- batch culture. Organogenesis- callus induction- rhizogenesis- induction of multiple shoots

UNIT III

Micro propagation- mass production of plantlets- hardening and mist chambers transplantation to field- techniques for maintaining plantlets in the field- somatic embryogenesis-protoplast isolation and culture.

UNIT IV

Principle of animal cell and tissue culture- advantages and disadvantages of culture methods- types of cells- primary and established cell lines- kinetics of cell growth-applications of animal tissue culture

UNIT V

Techniques of animal cell and tissue culture: Sources of cells- techniques of cell culture- cell culture media- culture procedure- preparation of animal materials- slide and coverslip culture- double cover slip cultures- flask culture- test tube culture-measurement of cell death

EMPLOYABILITY/ENTREPRENEURSHIP/SKILL DEVELOPMENT

REFERENCES:

- Plant tissue culture by Kalyan Kumar
- Animal Biotechnology by Ranga

Course Code	Course Title	L	T	P	C
19117AEC53	Enzyme and enzyme technology	4	1	0	3

Aim:

Objectives:

- To enable the students to understand in detail about the fundamentals of enzymes and their functions.

Outcomes:

- The course will provide an overview of the key enzymes currently used in large scale industrial processes
- This course includes the isolation, purification and characterization of enzymes and their applications
- Discover the current and future trends of applying enzyme technology for the commercialization purpose of biotechnological products.

UNIT I:

General Properties of enzymes, Enzymes nomenclature and classification, Isolation, purification, and methods of assay of enzymes, Coenzymes and co-factors

UNIT II:

Unit of activity, specific activity of enzyme – the active site, lock and key hypothesis – induced fit hypothesis and Strain or transition state stabilization, Mechanism of reaction catalyzed by chymotrypsin.

UNIT III:

General mechanism of enzyme regulation; Feedback inhibition and feed forward stimulation; Enzyme repression, induction and degradation; Control of enzymatic activity by products and substrates; Reversible and irreversible covalent modifications of enzymes.

UNIT IV:

Kinetics of enzyme – single substrate enzyme – Michaelis – Menton equation; Significance V_{max} and K_m value. Kinetics of Multi-substrate enzymes catalyzed reaction. Introduction to enzyme engineering and its applications. Allosteric enzymes and their significance.

Unit V:

Clinical and Industrial application of enzymes. Immobilization of enzymes and their applications. Ribozyme and their applications. Enzyme as biosensors

REFERENCES:

- Mahler and Cordes (1986) Biological Chemistry
- Nicholes C. Price and Lewis Stevens. Fundamentals of Enzymology; Oxford Univ. Press.
- Alan Fersht, Enzyme Structure and mechanism: Reading, USA.
- K.J.Laidler and P.S.Bunting. The chemical kinetics of enzyme action: Oxford University Press, London.

Course Code	Course Title	L	T	P	C
19117AEC54L	Developmental biology, tissue culture lab	0	0	3	3

Aim:

- Identify and describe the structural features of plants.
- Explain the mechanisms which lead to cell determination.

Objectives:

- Discuss the basic processes of plant metabolism, transport, nutrition, growth, and reproduction.
- Describe the evolutionary conservation of developmental mechanisms.

Outcomes:

- Demonstrate a basic understanding of developmental terms and mechanisms.
- Utilize laboratory techniques to design and carry-out experimental studies.
- Conservation of endangered plant species.
- Molecular, pharmacological and biochemical investigations of different aspects of plant growth and development such as in vitro flowering.

EX:

- Preparation of sperm smear
- Morphometric of sperm and ovum
- Study of egg types, cleavage, blastula, gastrula stages of frog
- Isolation of protoplast
- Protoplast viability test
- Preparation of media
- Demonstration of surface sterilization of explant
- Callus culture
- Primary cell culture and maintenance of cell lines

REFERENCES:

- Plant tissue culture manual, K. Linsey, 2007, Eastern book corporation.
- Culture of Animal cells: a manual of basic techniques, R. Ian Freshney, 2000 Wiley-Liss Inc.

Course Code	Course Title	L	T	P	C
19117AEC55L	Enzyme and enzyme technology lab	0	0	3	3

Aim:

- To learn the enzyme character and enzyme reaction

Objectives:

- To make students familiar with principles of enzyme activity, analysis of enzyme on the immune system

Outcomes:

- Distinguish the fundamentals of enzyme properties, nomenclatures, characteristics and mechanisms
- Apply biochemical calculation for enzyme kinetics
- Compare methods for production, purification, characterization and immobilization of enzymes
- Discuss various application of enzymes that can benefit human life

EX:

1. Microbial cell growth kinetics
2. Kinetic study of amylase
3. Immobilization of cells and enzymes by calcium alginate method
4. Estimation of enzyme (amylase)
5. Enzyme production and extraction-Lipase, protease and cellulase

REFERENCES:

- K.J.Laider and P.S.Bunting, The chemical kinetics of enzyme action: Oxford University Press, London.
- Molecular cloning by Sam brook *et al.* volume-1

Discipline Specific Elective -I

Course Code	Course Title	L	T	P	C
19117DSC56A	rDNA Technology	5	0	0	4

Aim:

- To improve the analytical and desirable manipulation skill for recombinant DNA technology

Objectives:

- The main objective of the paper is to expose students in using the current tools for rDNA technology and their applications.

Outcomes:

- Utilize the knowledge on creation of a genomic library
- explain the significance of model organisms in recombinant DNA technology
- This course teaches rDNA technology techniques and their application in the field of genetic engineering They learn about plasmids, vectors and gain knowledge on the construction of c-DNA libraries

UNIT I

Gene cloning: principle and strategies- vectors- general characters-types- replication- plasmids- phage vectors- cosmids- plant and animal vectors-Restriction endonucleases and ligases.

UNIT II

Gene Transfer methods-transformation-artificial methods of gene transfer- physical, chemical and biological methods- electroporation, biolistic, microinjection – liposome mediated gene transfer.

UNIT III

Genetic transformation of prokaryotes- introduction of DNA into living cell- identification of recombinations- introduction of phage DNA into bacterial cells

Cloning vectors for higher plants and animals- cloning DNA sequence that encode eukaryotic proteins.

UNIT IV

Construction of genomic DNA libraries and c-DNA library-probes-types and construction- screening a library-labelling of probes-applications of probe. Cloning in E.coli and yeast.

Concept of PCR-applications-PCRvariants- analysis of amplified product-c-DNAs, gene synthesis by PCR

UNIT V

Applications of rDNA technology in medicine, agriculture and industry. Safety aspects of rDNA technology, production of protein from cloned genes, production of recombinant protein by eukaryotic cells- animal and plant cell.

REFERENCES:

1. Biotechnology by U. Satyanarayana
2. Principles of gene manipulation by Old and primrose, Blackwell Scientific Publications
3. Molecular biotechnology: principles and applications of recombinant DNA by Bernard R. glick, jack J.pasternak, and Cheryl L.patien. 4th edn.2010.ASM press,
4. Gene cloning & DNA analysis- an introduction by T.A. brown, 7th edition, 2010. John Wiley Sons, ltd.

Course Code	Course Title	L	T	P	C
19117DSC56B	Molecular Biology	5	0	0	0

Aim:

- Apply problem-solving skills to biological problems and issues.

Objectives:

- To outline the microorganisms and their applications and thereby producing various products of industrial- and commercial uses.

Outcomes:

- Understand and apply the principles and techniques of molecular biology which prepares students for further education and/or employment in teaching, basic research, of the health professions
- Explain the concept of recombination, linkage mapping and elucidate the gene transfer mechanisms in prokaryotes and eukaryotes
- Know the terms and terminologies related to molecular biology and microbial

UNIT I:

DNA as the genetic material – RNA as a genetic material – genetic code;

UNIT II:

Organization and function of prokaryotic and eukaryotic genetic material, replication of DNA and RNA;

UNIT III:

DNA damage – mechanism of repair – excision repair, recombination repair; promoter, operator, terminator and attenuator;

UNIT IV:

Organization of chromosomes, specialized chromosomes, chromosome abnormalities; population genetics, gametic cell genetics, crossing over, Epistasis chromosome mapping, gene linkage, three point cross, tetrad analysis;

UNIT V:

Discovery of types and structure of plasmids natural and artificial plasmid transfer and their applications, Insertion sequence in prokaryotes, Transposable elements – discovery and characterization;

REFERENCES:

1. Microbial genetics: by S.R. Maloy, J. Egronan and D. Friefelder (1994) Jones and Bartlett Publishers.
2. Molecular genetics of Bacteria by J.W. Dale (1994) John wiley and sons.
3. Concepts of genetics by W.S. Klug and M.R. Cummings. Prentice Hall, 1997.
4. Introductions to Genetic Analysis by Coriffiths, Freeman and co., 1996.
5. Eckstein F, Lilley DM. 1996. Catalytic RNA, Springer – Verlag.
6. Fried berg EC., Walker CC. Siede W. 1995. DNA repair and mutagenesis. ASM Press.
7. Cardner EJ, Simmons MJ, Squstad DP, 1991. Principles of genetics. John wileyd sons.
8. Singer M. Berg P 1991. Genes and Genomes; University science Books.

Skill Based Elective V
PHOTO SHOP

Course Code	Course Title	L	T	P	C	Marks
19120SEC05AL	Package Lab-V	0	0	2	1	100

Outcome:

- work with the Photoshop workspace
- navigate images
- resize and crop images
- make and work with selections
- create new layers and perform other basic layer functions
- transform images

EX:

1. Design a Visiting card.
2. Design a Identity card.
3. Design a letter pad with LOGO.
4. Create an advertisement for Newspaper and Poster creation.
5. Design a calendar with pictures.
6. Design a Magazine.
7. Create a front page for a Magazine
8. Design a CD Cover.

Course Code	Course Title	L	T	P	C
19160SEC05B	SOFT SKILL V	0	0	2	1

PART -V Leadership Skills and Body Language

Outcome:

- Develop leadership skills and body language

UNIT I Leadership Skills

Leaders: their skills, roles, and responsibilities, Vision, Empowering and delegation, motivating others, organizational skills, team building, decision making, giving support, Vision, Mission, Coaching, Mentoring and counseling, Appraisals and feedback, conflict, Power and Politic, Organizing and conducting meetings, Public Speaking

UNIT II Body language

Handshake: Type of Handshake - Posture- Universal Facial Gestures- Eye Contact- Nervous Ticks-reading and analyzing body language, Body language signals and meanings -eyes, mouth, head, arms, hands, handshakes, legs and feet, personal space

Course Code	Course Title	L	T	P	C
1911ISEC05L	Communicative English lab -V	0	0	2	1

Aim:

- To develop communicative skills

Objective:

- To develop vocabulary
- To comprehend meaning from context
- To involve in a dialogue
- To note the important points from the text.
- To write a letter
- To understand the subject verb agreement
- To teach the different genders

Outcome:

- Develop corporate skills.
- Handle their day to day affairs well with their knowledge of language skills.
- Get a job

UNIT -I

Correct the spelling mistakes

Comprehension

UNIT -II

Find the odd one out

Picture description

UNIT -III

Abbreviations

Note making

UNIT -IV

Gender

Dialogue writing

UNIT -V

Acronyms

Concord

References: -

A Practical English Grammar

English Grammar

English Grammar and Composition

Technical Communication

-A.J.Thomson and A.V.Martinet

-Wren and Martin

-Radhakrishna Pillai

-Meenakshi Sharma & Sangeetha Sharma

SEMESTER VI

Course Code	Course Title	L	T	P	C
19117AEC61	Plant and animal biotechnology	4	0	0	5

Aim:

- Activities of Animal biotechnology
- Activities of plant biotechnology

Objective:

- Definitions and scope of Animal biotechnology
- Use the Big Data technology to assist basic and translational research in plants.

Outcomes:

- This course teaches organization and expression of plant and animal genome and plant and animal tissue culture
- Students learn about transgenic animal, their application in pharmaceutical industry, cloning and its importance.
- This course prepares the students in appreciating the its benefits and applications in biotechnological, pharmaceutical, medical and agricultural field

UNIT – I

Plant genome organization - Nucleus, Chloroplast genome and Mitochondrial genome, cytoplasmic male sterility. Regulation of gene expression in plant development. Plant-microbes-associated insect vectors and disease.

UNIT – II

Agrobacterium and crown gall tumor, Ti and Ri plasmids, T-DNA, binary vectors, 35S and other promoters, use of reporter genes and marker genes, gene transfer methods in plants. Direct and indirect DNA transfer. Manipulation of genes regulatory sequences in plants.

UNIT - III

Genetic engineering in plants. Pest transformation technique, pest and disease resistant plants. Benefits and transgenic technology, application of plant biotechnology for improved crop quality and productivity. Genetically engineered microorganisms- genetically modified crops.

UNIT – IV

Genetic engineering in animals; transformation of animal cells- vectors for animal cells-gene therapy-DNA fingerprinting in forensic science. In vitro fertilization and embryo transfer; transgenic animal production-xenograft

UNIT – V

Applications of biotechnology techniques- animal models, upstream and downstream process technology, molecular biotechnology for diagnostics techniques in identification and characterization-current scenario of molecular diagnosis in various disease. Animal health and welfare

REFERENCES:

- Plant Biotechnology by Mantell, S.H and Smith, H. 1983. Cambridge University press, UK
- Molecular biotechnology: principles and applications of recombinant DNA. By Bernard R. Glick, Jack J. Pasternak, and Cheryl L.Patten. 4th ed. 2010.ASM Press
- Genetic engineering in animals by A.Puller
- Applied molecular biotechnology edited by Muhammad sarwar khan, iqar ahmad khan and debmalaya barh.2016.2016 CRC press,taylor& francis group.
- Animal biotechnology: science-based concerns 2002 by committee on defining science-based concerns associated with products of animal biotechnology. THE NATIONAL ACADEMIES PRESS.
- Animal cell biotechnology by Hansjorg hauser, roland wagner (eds) 2015. Walter de gruyter gmbh, berlin

Course Code	Course Title	L	T	P	C
19117SEC62	Applied biotechnology	4	0	0	4

Aim:

- To introduce students to the application of mathematical modeling in the analysis of biological systems including populations of molecules, cells and organisms.

Objectives:

- The applied biotechnology major provides students with the scientific background and laboratory experience necessary for employment in the biotechnology.

Outcomes:

- Evaluate and describe systems of product research, development, and production
- Analyze the potential for commercialization for innovations within the biotechnology industry
- The students will gain the basic knowledge of aquaculture and Students will solve a variety of problems using creative thinking skills and analytical skills in the lab.

UNIT-I

Sericulture: History and origin of sericulture in India; Silk worms; rearing; controlling factors; harvesting techniques; Host plant varieties; distribution; cultivation techniques; Silk reeling; Natural enemies of mulberry garden and silk worms; By-products of sericulture.

UNIT - II

Vermiculture: Compost development, Quantification and characterization of solid waste; factors responsible for composting. Earthworm- rearing of earthworm; role of earthworms in vermicompost; vermisppecies, earthworms and microorganisms- vermicomposting- methods and steps; nutrition enrichment- applications of vermiculture.

UNIT -III

Mushroom cultivation: Mushroom culture. Historical background; Present status of Mushroom culture in India. Cultivation methods – infrastructure substrates; Preparation of spawns; Formulation and preparation of composts; Spawn running and cropping; Control of

pathogens and pests. Cultivation of *Volvariella* sp, *Pleurotus* sp and *Agaricus bisporus*, Nutritional values, Recipes from Mushroom.

UNIT – IV

Aquaculture: Definition- extensive, intensive and semi-intensive practices- preparation and management of ponds- estimation of live feed organisms- natural and artificial feeds- nutritional ecology- spawning and breeding- cultural techniques.

UNIT – V

Apiculture: Species of honey bees- life history- bee colony, castes, developmental significance of social life- natural colonies and their yield, Honey extraction- uses of honey and bee wax

REFERENCES:

- G. Ganga 2003 Comprehensive Sericulture Volume 2: Silkworm Rearing and Silk Reeling. Science Publishers, USA
- Beekeeping in India by Sardar Singh (I.C.M.A.R)

Course Code	Course Title	E	T	P	C
19117SEC63L	Plant, animal and applied biotechnology lab	5	0	0	3

Aim:

- Students are able to understand History, scope, principle, merits and demerits of animal and plant tissue culture.

Objectives:

- Laboratory facilities and culture media for animal tissue culture.
- Isolation and identification of Xanthomonas citri, Rhizobium sp, Azotobactor

Outcomes:

- The students should have knowledge on biotechnological analysis and the utilization of these knowledge about procedures and utilization of such knowledge to combine biotechnological methods to obtain analytical results
- The students will develop fundamental knowledge in Plant Molecular Biotechnology and its application in laboratory and industry settings.
- Describe mechanisms of plant pollination and differentiate between haploid and diploid cells and their role in sexual reproduction

EX:

1. Shoot induction from callus
2. Root induction from explant
3. Monoclonal antibody production,
4. Purification of Immunoglobulin's
5. Sericulture preparation
6. Spawn preparation
7. Mushroom cultivation
8. Preparation of vermibeds
9. Collection and Identification of earthworm
10. Isolation of microorganism from vermicompost

REFERENCES:

- Experiments in Microbiology, Plant Pathology, Tissue Culture and Mushroom Production technology. K.R.Aneja. 2001. New age international (P) Ltd Publishers.
- Plant tissue culture manual, K. Linsey, 2007, Eastern book corporation.
- Experimental procedures in Life Sciences, S.Rajan and R. Selvi Christy, 2010, Anjanaa book house.
- Handbook of practical sericulture. Ullal and Narashma, CSIR Bulletins on Sericulture.

Course Code	Course Title	L	T	P	C
19117AEC64L	Environmental biotechnology Lab	0	0	3	3

Aim:

- 5

tudents are able to understand basic environmental Waste Treatment process

Objectives:

- Domestic waste water treatment, Classification of Waste water treatment
- Biodegradation-Concept, Biodegradation of hydrocarbon, Measurement of biodegradation

Outcomes:

- To present an overview of important environmental biotechnologies involved in treatment of pollutants and resource recovery
- The students will be able to demonstrate the use of environmental science principle in solving various environmental problems
- Describe the most commonly applied disinfection methods, and the steps typically involved in drinking water treatment process

EX:

- Isolation of airborne bio particles
- Estimation of total solids in effluent sample
- Soil analysis: pH, Chloride, Calcium, Magnesium, Phosphorous and Nitrate
- Portability of water
- Determination of BOD& COD

REFERENCE:

- Experiments in Microbiology, Plant Pathology, Tissue Culture and Mushroom production technology, K.R.Aneja. 2001. New age international (P) Ltd publishers.
- Experimental procedures in Life Sciences, S.Rajan and R. Selvi Christy, 2010, Anjanaa book house.

Course Code	Course Title	L	T	P	C
19117DSC65A	Environmental Biotechnology	1	0	0	1

Aim:

- students are able to understand

Objectives:

- Bioremediation – Characterization site for bioremediation, Types of bioremediations
- Biodegradation-Assimilation, Detoxification, Biotransformation, Factor Affecting

Outcomes:

- Biofuels: Advantages, Energy from biomass, Biogas, Bio hydrogen, Biosafety
• Toxicity
Bio magnification, Threshold Dose, Factor Affecting Toxicity.
- Students will gain about environmental pollutions, preventive measures.
- Explain the microbial processes and growth requirements underlying the activated sludge process, nitrification, denitrification, enhanced phosphorus removal, and anaerobic digestion

UNIT: I

Environment: Basic Concepts; Environmental Pollution; Types of Pollution; Measurement of Pollution; Environmental Management; Water Pollution and Its Control; Water as a Resource; Water Bodies; Need for Water Management; Sources of Water Pollution; Measurement of Water Pollution

UNIT: II

Sewage/Waste water treatment - collection, Primary treatment, and Secondary treatment – Aerobic process: Activated sludge, Oxidation ditches, Trickling filters, towers, rotating discs, rotating drums, oxidation ponds, Anaerobic processes: Anaerobic digestion, Anaerobic filters, Tertiary treatment. Waste water treatment for some industries - dairy, distillery, tannery, sugar, antibiotic industries.

UNIT: III

Bio pesticides and biofertilizers; their role in pest and nutrient Management; Worm culture

Solid Wastes: Sources and Management; Composition; Methane Production; Food, Feed and Fuel from Biomass

UNIT: IV

Degradation of Xenobiotic Compounds in Environment: Decay Behavior and Derivative Plasmids; Hydrocarbons; Substituted Hydrocarbons; Oil Pollution; Surfactants; Bioremediation of Contaminated Soils

UNIT - V

Global environmental problems: Ozone depletion, Greenhouse effect and acid rain, their impact and biotechnological approaches for management. Environmental protection agencies

REFERENCES

1. Biotechnology - U. Sathyanarayana 2008
2. Environmental Biotechnology - Bruce E. Rittmann and Perry L. McCarty. 2001. McGraw Hill Publisher

Course Code	Course Title	L	T	P	C
19117DSC65B	Environmental Management	4	0	0	4

Aim:

- To motivate for participation in environment protection and improvement.

Objectives:

- Creating the awareness about environmental problems among people.
- Imparting basic knowledge about the environment and its allied problems.
- Developing an attitude of concern for the environment.
- Motivating public to participate in environment protection and environment improvement.
- Acquiring skills to help the concerned individuals in identifying and solving environmental problems.
- Striving to attain harmony with Nature.

Outcomes:

- The students in the course are exposed to the diversity, function, ecological adaptation of microorganisms within the environment
- This course gives the importance of microbial life to key ecosystem process and teaches the role of biotechnology to address environmental issues

UNIT-I

Water pollution – sources & types of water pollution – physical, chemical & biological – effect of water pollution, Drinking water quality standards waste water treatment – primary, secondary, tertiary-water pollution prevention & control act – 1974.

UNIT-II

Air pollution – structure and composition of atmosphere – classification, sources & effects of air pollution – Acid rain – greenhouse effect – global warming – Ozone depletion.

UNIT-III

Prevention and control of air pollution particulate control – settling chamber, scrubber, bag filter, cyclones electrostatic precipitators. Gaseous emission control methods. Air pollution prevention and control Act 1981.

UNIT-IV

Soil Pollution – soil pollutants – types – sources, effects & Control. Noise Pollution – sources effects & Control.

UNIT-V

Government Agencies & Programs – The Tiwari committee – creation of NCEPC,
Department of Environment & Forest – Function of State Pollution Control Board.

REFERENCES

1. Rao, M. N and H.V.N. Rao (1993) Air Pollution, Tata McGraw – Hill Publishing Company Limited. New Delhi.
2. Kudesia, V.P and Ritu Kudesia (1992) Water Pollution, Pragati Prakashan Publication, Meerut.
3. Sawyer, C. N., P.L McCarty and G.F. Perkin (1994) Chemistry for Environmental Engineers, II Edition, McGraw-Hill.
4. Sharma, B.K and H.Kaur (1994) Soil and Noise Pollution, Goel Publishing House, Meerut.
5. Kumarasawmy, K., A. Alagappa Moses and M. Vasanthi (2004) Environmental Studies (A Text Book for All under Graduate Students) Bharathidasan University Publications.

Course Code	Course Title	L	T	P	C
191110EC	Open Elective - Journalism	4	0	0	2

Aim:

- To acquaint with the basic knowledge of journalism so that it may enthuse the students to become journalists.

Objective:

- To instill in the minds of students the different aspects of journalism
- To understand the different kinds of news
- To learn the qualities and duties of a reporter, editor and sub editor
- To familiarize with the style and features of the different sections in a newspaper

Outcome:

- Become a journalist

UNIT- I

Journalism – Definition, Qualities of a journalist, Forms of journalism, Role and elements, Ethics of Journalism, Press

UNIT- II

News – Definition, Kinds, Elements, Sources

UNIT- III

Reporters, Qualities, types

UNIT- IV

The Editor and the Sub Editor-qualities, types, editorial department,

UNIT – V

Language of Journalism, Style

Qualities of a Writer

Writing a News story, Opinion Pieces, Reviews, Headlines, Editorials, articles, middle, features, column

References: -

- | | |
|---------------------------------|--------------------------------------|
| Journalism | -Susan |
| Professional Journalism | - John Hogenberg |
| News Writing and Reporting | - M.James Neal (Subject Publication) |
| Professional Journalism | -M. V Komath |
| The Journalist's Handbook | -M. V Komath |
| Mass Communication & Journalism | -D.S Mehta |

Course code	Course Title	L	T	P	C
19112OEC	Open Elective: Development of Mathematics Skills	4	0	0	2

Aim:

- To understand the concepts from the five branches of mathematics

Objectives

- Knowledge and understanding are fundamental to study mathematics and form the base from which to explore concepts and develop problem-solving skills. Through knowledge and understanding students develop mathematical reasoning to make deductions and solve problems.
- To develop student's ability to apply both conventional and creative techniques to the solution of mathematical problems

Outcomes

- Know and demonstrate understanding of the concepts from the five branches of mathematics (Operations Research, Set Theory, Statistics, Matrices and Business mathematics)
- Use appropriate mathematical concepts and skills to solve problems in both familiar and unfamiliar situations including those in real-life contexts
- Select and apply general rules correctly to solve problems including those in real-life contexts.

Unit I

Simple interest and compound interest

Unit II

Sinking fund – discounting – trade discount – quantity discount – cash discount

Unit III

Set theory – Series

Unit IV

Matrices – Determinants

Unit V

Assignment problems

References

P.A.Navanithan, Business Mathematics & Statistics

Kanti Swarup, P.K.Gupta and Manmohan, "Operations Research"

Course Code	Course Title	L	T	P	C
19113GEC	Open Elective- Instrumentation	4	0	0	2

Aim:

- Making and analyzing measurements is the primary task of the experimental physicist. This includes designing experiments. Most experimental work, whether in bench-top situations, or using complex instruments. To many physicists this can be as interesting and involving as the basic physics one is trying to do.

Objectives:

- The use of instruments is of course not confined to physicists and this kind of experience is valuable in many situations which many students will encounter after graduation.
- A good physicist will bring a critical mind aiming to understand not only the result of an investigation but the primary reasons for the behavior of the data. Understand that there are finite limits to our ability to make good measurements, and why.

Outcomes:

- Appreciate important practical aspects of theoretical knowledge: how important components work, when to impedance match, non-ideal behavior of op-amps etc.
- Acquire a sound understanding of the role of noise in measurement systems and know how to apply noise reduction techniques.
- Be able to apply Fourier and Laplace transforms to analyses the behavior and stability of complex systems.

UNIT – I: Introduction

Potentiometer - calibration of volt meter and ammeter, measurement of resistance, Principles of network theorems – Thevenin's and Norton's theorem – Bridges: AC bridges – Maxwell, Owen, Schering and De Sauty's bridges – Wien bridges.

UNIT – II: Electronic Instruments – I

Basic characteristics of instruments – resolution – sensitivity - Audio frequency oscillator, Conversion of galvanometer into voltmeter and ammeter – resistance meter - Amplified D.C. meter – Chopper stabilized amplifier – A.C. Voltmeter using Rectifiers – Electronic MultiMate – Differential voltmeter – Digital voltmeters – Component measuring instruments (quantitative studies)

UNIT – III: Electronic Instruments – II

Signal conditioning systems – DC and AC carrier systems – Instrumentation amplifiers – Vibrating capacitor amplifier – Analog to digital data and sampling – A/D and D/A convertor (successive approximation, ladder and dual slope conversions).

Unit IV – Recording Devices

Recorders necessity – Recording requirements – Analog recorders – Graphic recorders – strip chart recorders – Galvanometer types recorders – Null type recorders.

Unit V – CRO

CRO – Construction and action – Beam transit time and frequency limitations – Measurement of potential, current, resistance, phase and frequency – Special purpose oscilloscopes – Sampling storage oscilloscope.

Books for Study

Electronic Instrumentation and Measurement techniques – W.D. Cooper and A.D. Helfrick – PHI – Third edn. – 1989

Books for Reference:

1. A Course in Electrical and Electronic Measurements and Instrumentation – A.K. Sawhney – Dhanpat Rai and Sons – 1990.
2. Electronic Measurements and Instrumentation – Oliver Cate – McGraw Hill – 1975.

Course Code	Course Title	L	T	P	C
19114OEC	Open Elective-Food and Adulteration	4	0	0	2

Aim:

- To introduce students to food safety and standardization act and quality control of foods.

Objectives:

- To educate about common food adulterants and their detection.
- To impart knowledge in the legislator aspects of adulteration.
- To educate about standards and composition of foods and role of consumer.

Outcomes:

- The students will have knowledge about different processing and preservation methods and principals involved.

Unit-I Introduction to Food Chemistry

Introduction to Food Chemistry- Water (Structure of water and ice, Physical constants of water, Types of water, Water activity) Composition of Food- Carbohydrates, Proteins, Lipids, Vitamins & Minerals.

Unit- II Food Pigments

Introduction- classification, types of food pigments- chlorophyll, carotenoids, anthocyanins, flavonoids.

Unit – III Food Preservation

Introduction - Importance, principle and Types.

High and low temperatures preservation - Pasteurization- Sterilization- Canning- Freezing- Refrigeration.

Unit – IV Food Additives

introduction- antioxidants, sequestrants, preservatives, nutrient supplement, emulsifiers, stabilizers and thickening agents, bleaching and maturing agent, sweeteners, humectants and anti-caking agents, coloring and flavoring substance.

Unit-V Food Adulteration

Types of adulterants- intentional and incidental adulterants, methods of detection. Detection of common food adulterants in Spices, Grains, Coffee, Tea, Oil fats, Food colors and Milk. Health hazards and risks.

References:

- The Food Safety and Standard ACT, 2006 – Seth & Capoor
- Hand book of Food Adulteration and Safety Laws – Sumeet Malik
- Food Science – B.Srilakshmi

Course Code	Course Title	L	T	P	C
19120OEC	Open Elective -Web Technology	4	0	0	2

Aim:

- To equip the students with basic programming skill in Web Designing

Objective:

- To understand and practice markup languages
- To learn Style Sheet and Frames

Outcomes:

- Explore markup languages features and create interactive web pages using them
- Learn and design Client-side validation using scripting languages

UNIT I

Introduction to the Internet – Internet Technologies – Internet browsers.

UNIT II

Introduction to HTML – Head and body sections – Designing the body section.

UNIT III

Ordered and unordered lists – Table handling.

UNIT IV

DHTML and Style Sheet – Frames.

UNIT V

A web page design project – Forms.

Text Book

World Wide Web design with HTML – C. Xavier – Tata McGraw – Hill – 2000.

Reference Book

Principles of web design – Joel Sklar – Vikas publishing house 2001.

Course Code	Course Title	L	T	P	C
19122OEC	Open Elective-E-Commerce and its Application	4	0	0	2

Aim:

- To organize and promote the exchange of information on communication protocols and information exchange mechanisms for Electronic Commerce.

Objectives:

- To be aware of all aspects of communication and information exchange in Electronic Commerce, including:
 - Navigation, brokerage, advertising and catalogue exchange in pre-sales activities.
 - Negotiation and contract making protocols in interactions between consumers, businesses, and public administration.
 - Secure exchange of documents, content and value in open trading protocols.
 - Communication platforms for the e-Economy, including e-commerce, e-business and e-government.

Outcomes:

- Secure exchange of documents, content and value in open trading protocols.
- Communication platforms for the e-Economy, including e-commerce, e-business and e-government

UNIT-I:

History of E-commerce and Indian Business Context: Early Business Information Interchange Effort - Emergence of the Internet-Emergence of the world wide web - The milestones - Advantages of E-Commerce- Disadvantages of E-commerce-Online Extension of a BAM model- Transition to E-commerce in India- The internet and India TELCO- Managing Supply chain on the Internet- Hindustan Lever - Getting the E-advantage - Asian paints - E-transforming the organization - CRISII - Cost - Effective distribution channels - ICICI Bank - Comprehensive Transactions - E-transition challenges for Indian Corporate - The Information Technology Act,2000 - ITC'S echoupal

Business Models for E-Commerce: E-business models based on the Relationship of Transaction parties- E-business model base on the relationship of transaction types.

UNIT-II:

Enabling Technologies of the World Wide Web: Internet client - Server Application - Networks and Internets -Software agents - Internet Service Provider - Broadband Technologies - Hypertext -Java Script - XML

UNIT- III:

E-Marketing: Traditional Marketing - Identifying web presence Goals -The Browsing Behavior model - online marketing - E-advertising - Internet Marketing Trends - Target Markets - E-branding - Marketing strategies - The Times of India.

UNIT-IV:

E-Security; Information system security-security on the Internet-E-Business risk Management Issues-Information security environment in India.

UNIT-V

E-payment Systems: E-Banking at ICICI bank-Main concerns in internet banking-History's lesson about payments: People drive change-digital payment requirements-digital token-based E-payment systems-classification of new payment system-properties of electronic cash(E-cash)-check payment system on the Internet-risk and E-payment system-Designing E-payment system-digital signature-online financial service in India-online stock trading: The high-speed alternative.

Reference Book:

"E-Commerce: An Indian Perspective" P.T.Joseph, S.J. Third Edition

Course Code	Course Title	L	T	P	C
1916IOEC	Open Elective – Indirect Taxes	4	0	0	2

Aim:

- To acquaint with the knowledge of indirect taxes

Objectives:

- To make the students to gain expert knowledge in indirect taxes.
- To have practical knowledge on excise duties and customs duties.
- To learn the fundamentals of service tax, sales tax and VATS.

Outcome

- Students gained knowledge of various provisions of central excise customs law, service tax, VAT and sales tax and their applications in different circumstance.

UNIT – I

Objectives of Taxation - contribution to Government revenue- cannons of Taxation, – Tax system in India – Direct and Indirect taxes Advantages and Disadvantages of Indirect taxes.

UNIT – II

Central Excise Duty – Meaning - Levy and collection - Distinction between Excise duty and Customs Duty and Sales Tax. Types of excise duties Methods of Levying Excise Duty – Excise and small-scale Industries – Excise and Exports.

UNIT – III

Customs Duty – Levy and collection of customs duty Different types of customs Duties – Prohibition on importation and exportation of goods. Exemptions from customs duty.

UNIT – IV

Service Tax – Growth of Service sector – Meaning of Service Tax – Elements of Service Tax- exempted services from tax - Value of taxable services-Different services on which tax is payable.

UNIT Value Added Tax (VAT)

Meaning of VAT, Justification of VAT – VAT and Sales Tax Advantages and Disadvantages of VAT. Methods of Calculating VAT Levy of VAT and Types of VAT.

Reference Books:

- Income Tax Law and Practice -N.Hariharan.
- Business Taxation – T.S.Reddy/Hari Prasad Reddy.

**SKILL BASED ELECTIVE- VI
FLASH**

Course Code	Course Title	L	T	P	C
19120SEC06AL	Package Lab-VI	0	0	2	1

Outcome:

- Learn to create animated graphics and sound and interactivity.
- Can develop Website
- CD based presentations

EX:

1. Drawing and painting original art in flash.
2. Creating simple objects using flash.
3. Creating a frame-by-frame animation technique.
4. Develop a program for animation with motion Tweening.
5. Develop a program for animation with shape Tweening.
6. Develop a program for adding sound to your movies.
7. Create a simple Banner.
8. Create a simple animations techniques movie clip and graphic symbols

Course Code	Course Title	L	T	P	C
19160SEC06B	SOFT SKILL VI	0	0	2	1

PART -VI Life Skills and Other Skills

Outcome:

- Develop life skills and other skills

UNIT I Life Skills

Life Skills - Knows how to use technology to communicate safely and effectively. - Knows how to access community resources in case of emergency. - Knows how to obtain copies of personal documents - knows how to book train ticket, Bus Ticket and Air Ticket. - Occupational Safety, First-aid

**UNIT II
Other Skills**

Meditation, Improving personal memory, Study skills that include Rapid Reading, Notes Taking, Self-learning, Complex problem solving and creativity.

Course Code	Course Title	L	T	P	C
19111SEC06L	Communicative English Lab - VI	0	0	2	1

Aim:

- To develop communicative skills

Objective:

- To extract the main ideas from a text
- To understand the meaning of text
- To expand an idea
- To shorten a text
- To develop vocabulary
- To enhance writing skills
- To write simple, compound and complex sentences

Outcome:

- Apply study skills
- Widen creative thinking
- Be a good team worker
- Make them proficient in English

UNIT -I

Jumbled words
Paragraph writing

UNIT -II

Prefix and suffix
Precise writing

UNIT -III

Eponyms
Summarizing

UNIT -IV

Compound words
Simple, Compound and Complex

UNIT -V

Homophones
Essay writing

References: -

A Practical English Grammar
English Grammar
English Grammar and Composition
Technical Communication

-A.J.Thomson and A.V.Martinet
-Wren and Martin
-Radhakrishna Pillai
-Meenakshi Sharma & Sangeetha Sharma



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REGULATION-2019



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M.Sc., BIOTECHNOLOGY- REGULATION 2019

COURSE STRUCTURE

Course Code	Course Title	L	T	P	C
SEMESTER I					
19217AEC11	General Microbiology	6	1	0	5
19217AEC12	Molecular Genetics	6	1	0	5
19217AEC13	Biochemistry	6	1	0	4
19217SEC14L	Microbiology & Molecular Genetics - Lab	0	0	5	3
19217DSC15	Discipline Specific Elective I	5	0	0	4
19217RLC16	Research Led Seminar	-	-	-	1
	Total	23	3	4	21
SEMESTER II					
19217AEC21	Cell & Molecular Biology	6	1	0	5
19217AEC22	Biophysics & Bioinformatics	6	1	0	5
19217AEC23	Industrial Biotechnology	6	1	0	5
19217SEC24L	Molecular Biology & Industrial Biotechnology – Lab	0	0	5	3
19217DSC25	Discipline Specific Elective II	5	0	0	4
19217RMC26	Research Methodology	3	0	0	2
19217BRC27	Participation in Bounded Research	-	-	-	2
	Total	23	2	4	24
SEMESTER III					
19217AEC31	Genomics	6	1	0	6
19217AEC32	Proteomics	6	1	0	6
19217SEC33L	Genomic and Proteomics – Lab	0	0	5	3
19217DSC34	Discipline Specific Elective III	5	0	0	4
192_OEC	Open Elective	4	0	0	3
19217SRC35	Design/Socio technical research	-	-	-	2
	Total	21	2	5	24
SEMESTER IV					
19217AEC41	Food technology	6	1	0	6
19217AEC42	Bio instrumentation	6	1	0	6
19217SEC43L	Food technology and Bio instrumentation lab	0	0	5	3

19217DSC44	Discipline Specific Elective IV	5	0	0	4
19217PRW45	Project work	-	-	-	6
19217PEE	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)19217DSC15A- Immunology b)19217DSC15B- Biosafety and biodiversity
	Discipline specific Elective Courses-II
II	a)19217 DSC25A- Endocrinology b)19217 DSC25B- Bioethics and IPR
	Discipline specific Elective Courses-III
III	a)19217 DSC 34A- Nanobiotechnology b)19217 DSC 34B- Environmental biotechnology
	Discipline specific Elective Courses-IV
IV	a)19217 DSC44A- Gene therapy utilization pharmacology b)19217 DSC44B- Plant conservation & disaster management

Open Electives

Semester	Open Elective Courses
III	a) 19211OEC- Writing for the media b) 19212OEC-Applicable Mathematics Techniques c) 19213OEC-Bio-medical Instrumentation d) 19214OEC-Green Chemistry e) 19220OEC-M-Marketing f) 19261OEC- Insurance services g) 19280OEC-Counselling Psychology

Credit Distribution:

S.No	Sem	AEC	SEC	DSC	OEC	RSB	Others	Total
1.	I	14	2	4	-	1	-	21
2.	II	14	2	4	-	4	-	24
3.	III	12	3	4	3	2	-	24
4.	IV	12	3	4	-	6	2	27
Total		52	10	16	3	13	2	96

Course Code	GENERAL MICROBIOLOGY	L	T	P	C
19217AEC11		6	1	0	5

AIM:

- This paper provides the knowledge about different types of microorganisms and their identification techniques in modern biology and there by the usefulness of the techniques in research and commercial purposes.

OBJECTIVES:

- In order to make the students to understand the identification of microorganisms using advanced microbiological methods and applications of microorganisms.

OUTCOMES:

- Students can gain the idea of how to identify the microorganisms based on the modern polyphasic approach.

Unit I

Definition and historical account of microbiology. Diversified microbial world-Classification of microbes based on Whittaker's five kingdom system of classification. Structure of Algae, Bacteria, Fungi and Virus.

Unit II

Nutritional requirements and growth cycles of the above mentioned groups. Media for growth; Types, preparation, methods of sterilization. Isolation and enumeration of microorganisms in soil, water and air. Isolation of microorganisms from contaminated food. Techniques of pure culture, maintenance and preservation; staining; stains and dyes, types of staining; General techniques involved in Virology and Protozoology.

Unit III

Microbial physiology: Factors influencing the growth of microbes-classification based on the temperature, pH, nutrition, symbiotic associations, commensals, saprophytes, etc., Microbiology of fermented foods-dairy products, meat and fish, alcoholic beverages-beer, wine etc., Food spoilage and preservation process. Microbes as source of food. Application of microbes in

industries production of antibiotics, amino acids, organic acids, bioconversion process, microbial insecticides.

Unit IV

Biochemistry of Metabolism: Carbohydrates and energy metabolism – fermentation or glycolysis, TCA cycle and oxidative phosphorylation, ammonia metabolism. Biosynthesis of glutamate. Purine and pyrimidine biosynthesis. Synthesis of DNA and RNA. Biosynthesis of cell wall – Peptidoglycans and Teichoic acid.

Unit V

Microbes as components of the environment –nutrient cycles – C, N, S, H, O, Mn, K, Mg, Cl and phosphorus cycles. Degradation of industrial wastes, petroleum hydrocarbons, pesticides, bio fouling and corrosion. Bacterial photosynthesis, symbiotic and non-symbiotic nitrogen fixation, antimicrobial agents – structure of antibiotics, antibacterial and antiviral (function & mechanism of action)

SKILL DEVELOPMENT

Book references:

- Fundamental Principles of Bacteriology – A.J. Salle
- Microbiology – Michael J. Pelchar, E.C.S. Chan Noel R. Krieg.
- Microbial Physiology – Albert G. Moat and John W. Foster – Wiley – Interscience Publication
- Food Microbiology – W.C. Frazier and D.C. Westhoff, Tata Mcgrah Hill Publication
- Microbial Biotechnology – Alexander N. Glazer, Hiroshni-Kaido, W.H. Freeman and Co. 1995.
- Chemical Microbiology – Antony H. Rose, Butterworths, 3rd Edition, Plenum Press, 1976.

Course Code	Molecular genetics	L	T	P	C
19217AEC12		6	1	0	5

AIM:

- This paper in genetics has been structured to give the student an in depth knowledge of the organization of the genome in prokaryotes and eukaryotes, the principles of genetic inheritance and other vital aspects such as Hardy Weinberg law, pedigree analysis and the genetic basis of disease inheritance.

OBJECTIVE:

- The major objective of the paper is to envisage thorough knowledge in genetics and genome organizations in organisms.

OUTCOME:

- After successful completion of the paper the students will get an overall view about genetic makeup of organisms and can take up a career in research.

Unit I

Gene as the unit of mutation and recombination. Identification of DNA as the genetic material. Mutations: Molecular nature, mutagenesis by nitrous acid, hydroxylamine, alkylating agents, intercalators and UV, origin of spontaneous mutations and control, parasexual process in bacteria, transformation, transduction and conjugal gene transfer the phenomena, mechanisms and applications. Fine structure genetic analysis with examples.

Unit II

Recombinations – Control, models and mechanisms. Gene as the unit of expression. Gene – cistron relationship in prokaryotes and eukaryotes. Colinearity of gene and polypeptide. Elucidation of the genetic code. Wobble base pairing. Suppression of nonsense, missense and frameshift mutations. Regulation of gene expression in prokaryotes and eukaryotes. The operon concept – positive and negative control, attenuation control. Control sequences, promoter, operator, terminator and attenuator, DNA methylation and epigenic regulation.

Unit III

DNA damage and repair DNA damage by UV, alkylating agents, cross linkers. Mechanisms of repair – photo activation, excision repair, recombination repair. The SOS and adoptive responses and their regulation, heat shock response.

Unit IV

Extrachromosomal heredity, Biology of plasmids – discovery, types and structure of RTF, col-factors and Ti. Replication and partitioning. Incompatibility and copy number control. Natural and artificial plasmid transfer and their applications. Transposable genetic elements: discovery, early experiments of McClintock in maize. Insertion sequences in prokaryotes. Complex transposons – Tn 10, Tn 5, Tn 9 and Tn 3 as examples. Mechanisms control, consequences and applications of transposition by simple and complex elements. Retro elements.

Unit V

Genetics of Eukaryotes: Gene linkage and chromosome mapping, crossing over, three point cross, tetrad analysis, Complementation. Organization of chromosomes, specialized chromosomes. Chromosome abnormalities, quantitative inheritance, population genetics. Developmental genetics using *Drosophila* as model system. Somatic cell genetics.

SKILL DEVELOPMENT

Reference Books:

- Microbial Genetics – S.R. Maloy, J.E. Cronan and D. Friefelde 1994. Jones and Barlett Publishers.
- Molecular Genetics of Bacteria – J.W. Dale 1994 John Wiley and Sons.
- Concepts of Genetics – W.S. Klug and M.R. Cummm Prentice Hall, 1997.
- Introduction of Genetic Analysis of Griffiths – Freeman Co., 1996.
- Advanced Molecular Biology of the Gene – Watson J.D. Hopkins NH, Roberts, J.W. Steitz. J.A.

Course Code	BIOCHEMISTRY	L	T	P	C
19217AEC13		6	1	0	4

AIM:

- This paper presents the study of identification and quantitative determination of the substances, studies of their structure, determining how they are synthesized metabolized and degraded in organisms, and elucidating their role in the operation of the organism.

OBJECTIVE:

- On the successful completion of the course the students will get an overall understanding of structure of atoms, molecules and chemical bonds, enzyme kinetics, bio polymers and metabolic reactions in a living system.

OUTCOME:

- This paper in biochemistry has been designed to provide the student with a firm foundation in the biochemical aspects of cellular functions which forms a base for their future research.

Unit I

Principles of Bioenergetics, Glycolysis and catabolic of hexoses the citric acid cycle, Oxidation of fatty acids, Oxidation of amino acids, Oxidative phosphorylation, Glyoxylate cycle, TCA cycle, Krebs cycle, Pentose Phosphate pathway, Nitrogen cycle.

Unit II

Carbohydrate – types, structure and functions of carbohydrates, biosynthesis, lipid biosynthesis, C2, C3, C4 cycles. Biosynthesis of fatty acids and triacyl glycerol. Secondary metabolites – occurrence, classification and functions of phenolic, terpenes, flavonoids, alkaloids, saponins, glycosides. Applications of secondary metabolites in food, dairy, agricultural, cosmetics and pharmaceutical Industries.

Unit III

Biosynthesis of amino acids, nucleotides and related molecules, Classification of proteins based on functions and solubility, types of proteins structure and functions, Chemical synthesis of peptides and oligosaccharides. A general account of secondary metabolic pathway.

Unit IV

Integration and hormonal regulation of mammalian metabolism. Biological membrane and transport. Enzymes classification, mechanism, factors affecting enzyme action Vitamins and minerals.

Unit V

Lipids classification, importance, fatty acids, essential non-essential fatty acids. Prostaglandins, leukotrienes, thromboxanes, interferons and interleukins. Antibiotics, cytoskeletal organization, ribozymes.

SKILL DEVELOPMENT

Book references:

- Principles of Biochemistry – A.L. Lehninger, D.L., Nelson and MM Cox 1993 Wokrth Publishers, New York.
- Biochemistry – L. Styler 1994 Freeman & Co New York. .
- Biochemistry – G. Zubay 1988 macmillan Publishing Co New York and Business

Course Code	MICROBIOLOGY & MOLECULAR GENETICS LAB	L	T	P	C
19217SEC14L		0	0	4	2

AIM: This paper in genetics has been structured to give the student an in depth knowledge of the organization of the genome in prokaryotes and eukaryotes, the principles of genetic inheritance and other vital aspects such as Hardy Weinberg law, pedigree analysis and the genetic basis of disease inheritance.

OBJECTIVE:

- The major objective of the paper is to envisage thorough knowledge in genetics and genome organizations in organisms.

OUTCOME:

- After successful completion of the paper the students will get an overall view about genetic makeup of organisms and can take up a career in research.

1. Culture media preparation liquid and solid media

2. Selective differential media

3. Methods of sterilization and testing of sterility

4. Enumeration of bacteria, fungi and actinomycetes from soil

5. Pure culture techniques – Pour, spread and looping method

6. Maintenance and preservation of culture

7. Staining of Bacteria – gram, spore and AFB, Fungal wet mount – LPI

8. Motility test – hanging drop and soft agar motility

9. Water quality test – MPN

10. Effect of different parameters on bacterial growth kinetics (Substrate, pH, Temperature)

11. Single colony – isolation and checking for genetic markers, measurements of Growth rate one stop growth curve using T7 phage

12. Induced mutagenesis and isolation of antibiotic resistant and auxotrophic mutants

Enrichment methods for auxotrophic and antibiotic resistant mutants.

3. Genetic mapping by p1 transduction, genetic mapping of conjugation and

Transformation

4. Transposon mutagenesis of chromosomal DNA, Transposon mutagenesis of

Plasmid DNA

5. Experiments with gene fusion.

EMPLOYABILITY/ ENTREPRENEURSHIP/SKILL DEVELOPMENT

Book references:

- 1) Sadasivam, S. and Manickam A. Biochemical Methods, 2nd Edition, New age International Private Ltd. Publishers.
- 2) Laboratory Techniques in Biochemistry and Molecular Biology.
- 3) A short Course in Bacterial Genetics – J.H. Miller 1992, Cold Spring Harbour Laboratory.
- 4) Methods for Genetics and Molecular Bacteriology – RGF Murray, W.A. Wood & N.B. Krig 1994 American Society for Microbiology.

Course Code	DISCIPLINE SPECIFIC ELECTIVE I	L	T	P	C
19217DSC15A	Immunology	5	0	0	4

AIM:

- Understanding the immune system, antigen antibody reactions, applications of immunological techniques, humoral and cell mediated immunity, hypersensitivity reactions and hybridoma technology.

OBJECTIVE:

- To expose the students with various immune systems of human body.

OUTCOME:

- This course will provide the student insights into the various aspects of Immunology such as classical immunology, clinical immunology, Immunotherapy and diagnostic immunology.

Unit I

Molecular cells & organs of Immune system, Historical perspective, Innate Immunity -Skin, Mucosal Surface, Physiological barrier, Inflammation, Adaptive Immunity, Molecules of innate & Acquired immune system:- Complement, Interferon, other molecules Cells of Innate & Acquired Immune system, Organs of the immune system:-Primary Lymphoid organs, Secondary Lymphoid organs, Lymphatic etc.

Unit II

Antigens, Antibody & Ag-Ab Interaction - Antigens: - Immunogenicity vs Antigenicity, Factors influencing Immunogenicity, Adjuvant, Epitopes & Haptens, super antigens, autoantigens, Antibody:- Structure, classes & functions, Allotypes & Idiotypes. Basic principles of Antigen-Antibody Interaction. Immunological techniques: Principles & Applications: Precipitation & agglutination, Radio, Immunoassay, Enzyme linked Immunosorbent Assay etc.

Unit III

Mechanism of Immune response, Generation of Immunological diversity, Antigen recognition, Lymphocyte development & activation, Lymphocyte interaction, cytokines & lymphoid system

Unit IV

MHC & Transplantation Immunology - MHC: - General organization, MHC molecules & genes, Cell recognition of self & nonself, MHC restriction, Tolerance:- Central Peripheral & acquired tolerance. HLA typing methods using serological and molecular techniques.

SKILL DEVELOPMENT

Unit V

The Immune system in Health & Disease, AIDS & other Immuno deficiencies, Autoimmunity & autoimmune diseases. Hypersensitivity, Vaccines:- Principle & types of vaccines, Recent advances in vaccination, Monoclonal & Recombinant antibodies. Immunological techniques: RIA, ELISA, Immunocytochemistry, Immunoblotting, Fluorescence antibody techniques.

- **Book references:**
- Immunology – An Introduction, Tizard R. Jan, 1995
- Immunology – Roitt Ivan, Jonathan Brastoff, David Male, 1993.
- Immunology – Janis Kubey, 3rd Edition.
- Text Book of Microbiology – Ananthnarayanan R and Jayaraman Panikar, 1996.
- Immunology – Weir D.M. and Steward, J. 1997. 8th Edition Churchill Livingstone New York.

Course Code	DISCIPLINE SPECIFIC ELECTIVE BIOSAFETY AND BIODIVERSITY	L	T	P	C
19217DSC15B		5	0	0	4

AIM:

- This course has been designed to provide the student insights into these invaluable areas of biotechnology, which play a crucial role in determining its future use and applications.

OBJECTIVE:

- Students get an idea about the advantages and disadvantages of biotechnological applications, ethical implications, and intellectual property rights.

OUTCOME:

- To study the diversity of plants and animal life in a particular habitat, ethical issues and potential of biotechnology for the benefit of man kind

Unit 1:

Introduction and historical background. Introduction to biological safety cabinets, primary containment for biohazards, biosafety levels, biosafety levels of specific microorganisms, recommended biosafety levels for infectious agents and infected animals. Biosafety guidelines by Government of India. Definition of GMOs and LMOs.

Unit 2:

Environmental release of GMOs, risk assessment, risk management and communication. Overview of national regulations and relevant international agreements including Cartagena protocol.

UNIT 3:

Biodiversity – Concept and Definition Scope and Constraints of Biodiversity Science, Composition and Scales of Biodiversity: Genetic Diversity, Species/ Organismal Diversity, Ecological/ Ecosystem Diversity, Landscape/ Pattern Diversity, Agrobiodiversity, Biocultural Diversity and Urban Biodiversity.

UNIT 4:

Values of biodiversity Instrumental/Utilitarian value and their categories, Direct use value; Indirect/ Non-consumptive use value, Introduction to Ecological Economics; Monetizing the

value of Biodiversity; Intrinsic Value; Ethical and aesthetic values, Anthropocentrism, Biocentrism, Ecocentrism and Religions; Intellectual Value; Deep Ecology.

UNIT 5

Threats to biodiversity Habitat Destruction, Fragmentation, Transformation, Degradation and Loss; Causes, Patterns and consequences on the Biodiversity of Major Land and Aquatic Systems Invasive Species' pathways, biological impacts on terrestrial and aquatic systems; Extinction: Types of Extinctions, Processes responsible for Species Extinction, Current and Future Extinction Rates, IUCN Threatened Categories, Sixth Extinction/Biological Crisis.

EMPLOYABILITY/ENTREPRENEURSHIP /SKILL DEVELOPMENT

REFERENCES

- Groom MJ, Meffe GR and CR Carroll, (2006). Principles of Conservation Biology. Sinauer Associates, Inc., USA
- Krishnamurthy KV, (2003). Textbook of Biodiversity. Science Publication
- Primack R, (2014). Essentials of Conservation Biology. Sinauer Associates,
- Hambler C and SM Canny, (2013). Conservation. Cambridge University Press.
- Van Dyke F, (2008). Conservation Biology Foundations, Concepts, Applications 2nd Edition,

Course Code	CELL & MOLECULAR BIOLOGY	L	T	P	C
19217AEC21		5	1	0	5

AIM:

- This paper provides a thorough knowledge about structure and function of cells, cellular energetics, protein trafficking, bio molecules and cellular development.

OBJECTIVE:

- Understanding the structural and functional aspects of the cell provides the student with a strong foundation in the molecular mechanisms underlying cellular function.

OUTCOME:

- Students after completion of this paper will be exceptionally well prepared to pursue careers in cellular and sub cellular biological research, biomedical research, or medicine or allied health fields.

UNIT-I

Cell architecture: Structure of cells – structure of prokaryotic and eukaryotic cells; surface appendages – Cilia and Flagella, Capsules, Pili, Fimbriae and slime layers; Cell walls – Algae, fungi, bacteria; Membranes of Gram positive, Gram negative bacteria and acid fast bacteria, protoplast, spheroplast and endospores; Transport across membrane – active and passive transport, transport channels and pumps, transport across nuclear membrane; Neurotransmission, neuromuscular junction.

UNIT-II

Cellular constituents: Cytoskeleton and structural components – Microfilaments, Intermediate filaments, Microtubules; Mitochondria – structure, biogenesis; Chloroplast – structure, biogenesis; Endoplasmic reticulum and Golgi complex – structure, function, vesicular transport and import into cell organelles; Structure and function of ribosomes, mesosomes, lysosomes, peroxisomes.

UNIT-III

Nucleus: Nucleus structure – structural organization, nucleosome, supranucleosomal structures, specialized chromosomes, polytene and lamp brush chromosomes and chromosome banding; Nucleic acid structure: DNA and RNA

UNIT-IV

Cell cycle: Mechanism of cell division – Mitosis, meiosis and genetic recombination; regulation of cell cycle – factors and genes regulating cell cycle (Cyclins, CDK and CDKI); Biochemistry and molecular biology of Cancer – malignant growth, tumor suppressor genes (p53, RB) and oncogenes (Ras), chemical carcinogenesis, hormonal imbalances

UNIT-V

Cellular development: Extracellular matrix – cell to cell and cell-matrix adhesion; cell junctions; Cellular systematic – components of systematic, receptors (cell surface – GPCR, RTK, TGF- β , Hedgehog, Wnt, Notch-Delta, NF- κ B, ion channels; intracellular – NO, Nuclear receptor), secondary messengers, effectors; cell differentiation, gametogenesis and fertilization; development of Drosophila and Arabidopsis – spatial and temporal regulation of gene expression

EMPLOYABILITY/ENTREPRENEURSHIP /SKILL DEVELOPMENT

REFERENCES

- Introduction to genetics: A molecular approach, T.A. Brown, Garland Science, 2011.
- Molecular Biology of the Gene (7th Edition, J.D.Watson, Tania A. Baker, Stephen P. Bell
- Michael Levine, Richard Losick) Benjamin/Cummings Publ. Co., Inc., California, 2013
- Genes XI (9th Edition) Benjamin Lewin, Jones & Bartlett Learning, 2008
- Molecular biology and Biotechnology. A comprehensive desk reference, R.A. Meyers (Ed) Wiley-Blackwell Publishers, 1995

Course Code	BIOPHYSICS & BIOINFORMATICS	L	T	P	C
19217AEC22		5	1	0	5

AIM:

- Biology is fast becoming an interdisciplinary science. There is accumulation of large amount of information in different areas of biology - on genome sequences of many organisms, genetic and biochemical interaction networks, cell interactions during development, and organism response to environmental stimuli, along with molecular understanding of diseases. This has led to the emerging need for a holistic description of the working of biological systems at different scales.

OBJECTIVES:

- To gain an appreciation for the field of systems biology. To understand and learn the technical details of several current experiments or technologies used in the field of systems biology. To understand some of the larger questions and issues with systems biology and large-scale data collection and analysis.

OUTCOMES:

- This paper has been designed to give the students comprehensive training in the emerging and exciting upcoming field of Systems Biology, which will help students to get career in both industry/R&D.

UNIT-1

Physics and biology: scope and methods of biophysics. Levels of molecular organization. Association of macromolecules, lipids in biological membranes. Protein in biological membranes. Molecular machines and dynamics.

UNIT-II

Understanding structures of proteins at different levels- primary, secondary, tertiary and quaternary; conformational analysis and forces. Understanding structures of nucleic acids at different levels- primary, secondary, tertiary and quaternary; conformational analysis of interactions- polysaccharides

UNIT-III

introduction to Bio-informatics-scope and application characteristics of hardware and software
Types of computer, Bio-chips, and computer network sending and receiving e-mail Internet
browsing- searching biological articles information in internet

EMPLOYABILITY/ENTREPRENEURSHIP /SKILL DEVELOPMENT

UNIT-IV

Computer applications in biology- uses of databases in biology- analysis of proteins and nucleic acid sequence- molecular modeling- introduction to data processing- files- data collection- preparation-editing- backup- file recovery-procedure-sorting-searching and merging.

UNIT-V

Biomolecules- carbohydrate, protein, lipids and nucleic acids, protein conformation-prediction of protein structure-fold recognition, comparative modeling (homology)-basic principles of X-ray diffraction studies, NMR, Mass spectroscopy in identifying protein information.

Reference books:

- Introduction to protein structure by C. Branden and J. Tooze(1991) Garland publishing company
- Biochemistry by L.Stryer. (1995) WH freeman and co.
- Biophysical chemistry part-I& III by cantor and schimme(1980) WH freeman and co.
- Biophysics and bio physical chemistry by debajyoti Das (1987) academic press.
- Molecular databases for protein sequence and structure studies by sillince. JA and sillince .M (1991) spring verlag.
- Sequence analysis primer by M. Gribskov, J.Dyvereux()1989 stockton press.

Course Code	INDUSTRIAL BIOTECHNOLOGY	L	T	P	C
19217AEC23		5	0	0	4

- **AIM:** To understand the, environmental pollution and remediation using Biotechnology and its control.

OBJECTIVE:

- Students will get an idea about the hazards to our environment, solutions to protect it and for sustainable development.

OUTCOMES:

- This course is important in the era of industrialization leading to environmental hazards and hence will help students to take up a career in tackling industrial pollution and also to take up the research in areas like development of biological systems for remediation of contaminated environments (land, air, water), and for environment-friendly processes such as green manufacturing technologies and sustainable development.

UNIT-I

Industrial microbiology- an introduction- modern fermentation process and biochemical engineering- isolation, screening and strain improvement of microorganisms

UNIT-II

Media design and sterilization for fermentation processes- media requirements for fermentation processes- examples of simple and complex media. Design and usage of commercial media for industrial fermentations- batch and continuous fermentations system- sterilization system of liquid media and air

UNIT-III

Basic principles of bioprocess-media formulation- fermentation equipment and its use- type of fermenter (Batch and continuous fermenter) and its application. Tray, CSTR, BCF, HFMB, RBC and inner and outer loop

UNIT-IV

Traditional industrial process – anaerobic process (ethanol, lactic acid, acetone- butanol production) - aerobic process (citric acid baker's yeast penicillin production)

EMPLOYABILITY/ENTREPRENEURSHIP /SKILL DEVELOPMENT

UNIT-V

Medical application of bioprocess engineering- commercial tissue culture process- gene therapy using viral vectors- models of viral infections- mass production of retrovirus. Advanced biological waste water treatment applications

REFERENCES:

- Industrial microbiology by J.H patel
- Industrial microbiology by G.H casida

Course Code	MOLECULAR BIOLOGY & INDUSTRIAL BIOTECHNOLOGY lab	L	T	P	C
19217SEC24L		0	0	4	2

AIM:

This paper provides a thorough knowledge about structure and function of cells, cellular energetics, protein trafficking, bio molecules and cellular development.

OBJECTIVE:

Understanding the structural and functional aspects of the cell provides the student with a strong foundation in the molecular mechanisms underlying cellular function.

OUTCOME:

Students after completion of this paper will be exceptionally well prepared to pursue careers in cellular and sub cellular biological research, biomedical research, or medicine or allied health fields

- > Living cells preparation by histochemical techniques
- > Microscopy
- > Spore preparation of bacteriostatic
- > Production of enzyme amylase
- > Immobilization of cells and enzymes by calcium alginate matrix
- > Effect of different parameters on bacterial growth kinetics (pH, temperature)
- > Production of organic acid
- > Immunocytochemical analysis for specific cellular constituents
- > Cytochemical study of cells/ cell types using specific dyes reagents
- > Estimation of protein and carbohydrates
- > Alcoholic fermentation of fruit juice by yeast (*Saccharomyces cerevisiae*)
- > Separation of amino acid by paper chromatography

EMPLOYABILITY/ ENTREPRENEURSHIP /SKILL DEVELOPMENT

REFERENCE:

- Sadasivam.S and Manickam.A biochemical methods H Edition. New Age international PVT. Publishers.
- Boyer R. Modern experimental biochemistry, III edition, Benjamin Cummings publishers.

Course Code	ENDOCRINOLOGY	L	T	P	C
19217DSC25A		5	0	0	4

AIM:

This is a comprehensive study of the endocrine system which will allow the student to integrate and better understand the functions of the other systems of the body. The relationship of the nervous system to the endocrine system is explored in the context of signaling within a multicellular organism.

OBJECTIVE:

To have a basic understanding of the endocrine system.

OUTCOMES:

To know the pathophysiological significance of the system with special reference to humans.

UNIT-I

Hormones in general- definition- types of secretions- nature-classification, synthesis and their role- feedback control with specific examples hormone action proteins and steroids- cell signaling in hormone action

UNIT-II

Hypothalamus hypo physical axis – hormones of hypothalamus and their role structure of pituitary –secretions-physiological role- pathophysiology current status of pituitary as a master gland.

UNIT-III

Thyroid- parathyroid – structure- hormones- synthesis-storage-release-carrier proteins (cb, TBA&TBG)-physiological role-pathophysiology

ENTREPRENEURSHIP

UNIT-IV

Adrenal and gonadal hormones- steroid biosynthesis- maintenance of cyclicity physiological role- pathophysiology- steroids in metabolism

UNIT-V

Gastro intestinal hormones-pancreas as an endocrine organ- secretions- functions-physiological role and pathophysiology other endocrine organs in vertebrates insect and crustacean hormones-their role in growth and metamorphosis

REFERENCE:

- Text book of endocrinology-Williams
- Physiological review of biochemistry-harper and others

Course Code	DISCIPLINE SPECIFIC ELECTIVE II	L	T	P	C
19217DSC25B	BIOETHICS AND IPR	5	0	0	4

AIM:

- To acquire specialized knowledge of law and practice relating to Insurance.

OBJECTIVE:

- The aim of this paper is to introduce the basic concepts of Intellectual property laws to the students for first time and familiarize them with the kind of rights, remedies and licensing regime associated with each kind of intellectual property so that students can have a basic understanding of Intellectual Property laws.

OUTCOME:

- To get registration in our country and foreign countries of their invention, designs and thesis or theory written by the students during their project work and for this they must have knowledge of patents, copy right, trademarks, designs and information Technology Act. Further teacher will have to demonstrate with products and ask the student to identify the different types of IPR.

Unit 1: Overview of Intellectual Property

Introduction and the need for intellectual property right (IPR) - Kinds of Intellectual Property Rights: Patent, Copyright, Trade Mark, Design, Geographical Indication, Plant Varieties and Layout Design - Genetic Resources and Traditional Knowledge - Trade Secret - IPR in India: Genesis and development - IPR in abroad - Major International Instruments concerning Intellectual Property Rights: Paris Convention, 1883, the Berne Convention, 1886, the Universal Copyright Convention, 1952, the WIPO Convention, 1967, the Patent Co-operation Treaty, 1970, the TRIPS Agreement, 1994

Unit2: Patents

Patents - Elements of Patentability: Novelty, Non Obviousness (Inventive Steps), Industrial Application - Non - Patentable Subject Matter - Registration Procedure, Rights and Duties of Patentee, Assignment and license, Restoration of lapsed Patents, Surrender and Revocation of Patents, Infringement, Remedies & Penalties - Patent office and Appellate Board

Unit 3: Copyrights

Nature of Copyright - Subject matter of copyright: original literary, dramatic, musical, artistic works, cinematograph films and sound recordings - Registration Procedure; Term of protection; Ownership of copyright; Assignment and license of copyright - Infringement, Remedies & Penalties - Related Rights - Distinction between related rights and copyrights

Unit 4: Trademarks

Concept of Trademarks - Different kinds of marks (brand names, logos, signatures, symbols, well known marks, certification marks and service marks) - Non Registrable Trademarks - Registration of Trademarks - Rights of holder and assignment and licensing of marks - Infringement, Remedies & Penalties - Trademarks registry and appellate board

Unit 5: Other forms of IP

Design: meaning and concept of novel and original - Procedure for registration, effect of registration and term of protection

Geographical Indication (GI): Geographical indication: meaning, and difference between GI and trademarks - Procedure for registration, effect of registration and term of protection Plant Variety Protection

Plant variety protection: meaning and benefit sharing and farmers' rights - Procedure for registration, effect of registration and term of protection Layout Design Protection

Layout Design protection: meaning - Procedure for registration, effect of registration and term of protection

EMPLOYABILITY/ENTREPRENEURSHIP/SKILL DEVELOPMENT

Reference book:

- V K Ahuja; Law relating to Intellectual Property Rights; Lexis Nexis, 2017 Reference
- **Journal:** 1. Journal of Intellectual Property Rights (JIPR); NISCAIR
- **Text book:** 1. Neeraj Pandey and Khusdeep Dharni; Intellectual Property Rights; PHI learning Pvt.Ltd., India 2014

Course Code	RESEARCH METHODOLOGY	L	T	P	C
19217RMC26		3	0	0	2

AIM:

- This course introduces and discusses approaches, strategies, and data collection methods relating to research in social sciences. Students will consider how to select the appropriate methodology for use in a study to be performed.

OBJECTIVE:

- This course aims to guide Master One students at the Section of English in the University of Biskra towards achieving competence and proficiency in the theory of and practice to research. This fundamental objective can be realized through helping these students to develop the subject of their research, encourage the formation of higher level of trained intellectual ability, critical analysis, rigor, and independence of thought, foster individual judgment, and skill in the application of research theory and methods, and develop skills required in writing research proposals, reports, and dissertation

OUTCOME:

- To culminate this final stage, students will learn to write a comprehensive research proposal that may be conducted in the future.

Unit I-Research

Selection of problem-stages in the execution of research; choosing a topic to publication; preparation of manuscript-report writing- format of journals – proof reading – sources of information; Journals, reviews, books, monographs, etc, Bibliography, Journal; standard of research journals – Impact factor

Unit II: Statistical method

Measures of dispersion; Universe and population – delimiting population – sampling method – random sampling, stratified random sampling – types of variables; qualitative and quantitative variables – continuous and discontinuous variables – scaling method S- mean – standard deviation – standard error – coefficient of variation

EMPLOYABILITY/ENTREPRENEURSHIP/SKILL DEVELOPMENT

Unit III

Comparison of means, chi-square test, student test (ANOVA - partitioning of variation), F test - model sums on one way ANOVA with interpretation of data - introduction to MANOVA - Statistical and their use - significance test and fixing levels of significance - use of statistical software like COSTAT and STATISTICA. Brief introduction to pie and histograms. Use of LCD.

UNIT IV:

Chromatography - principle, operative technique and applications of paper, TLC, adsorption chromatography, GLC and HPLC. Ion-Exchange, molecular sieve, Electrophoretic techniques - principle and technique of gel, SDS, high voltage and discontinuous electrophoresis, isoelectric focusing, pulsed field gel electrophoresis and capillary electrophoresis. Spectrometry - Centrifugation techniques.

UNIT V:

X-Rays - X-Ray diffraction, crystals and detectors, quantitative analysis and applications. Radio chemical methods - Basic concepts, counting methods and applications, Autoradiography, detection and measurement of radioactivity, applications of radioisotopes in biology.

References:-

- An introduction to practical biochemistry by David T. Plummer.
- Laboratory Manual in Biochemistry by Pattabiraman and Acharya
- Practical Biochemistry by J. Jayaraman.
- Analytical Biochemistry, D. J. Horie and Hazel Peck, Longman group, 3rd edition, 1998.
- Physical Biochemistry - Application of Biochemistry and Molecular Biology, David Friefelder, W.H Freeman and Co, 2nd Edition 1999.
- Experimental Biochemistry, Robert Switzer and Liamgarrity, W.H. Freeman and Co, 3rd 1999.
- Davis, G.B and C.A Parker, 1997. Writing the doctoral dissertation, Barrons Education series, 2nd edition, Pp 160, ISBN: 081208005
- Duncary, P. 2003. Authoring a Ph. D thesis: how to plan, draft, write and finish a doctoral dissertation. Plgrave Macmillan, Pp256. ISBN 1403905843

Course Code	GENOMICS	L	T	P	C
19217AEC31		6	1	0	6

AIM:

- To study prokaryotic and eukaryotic genomes, general methods of genome sequencing techniques, genome analysis and annotations, genome mapping techniques and applications of genomics.

OBJECTIVE:

- Explain the aspects of genome organization, analysis and applications.
- Provide the details of prokaryotic and eukaryotic genome.

OUTCOME:

- Acquire the aspects of Gene Contig and Shotgun method.
- Know the features of the Genome Mapping databases.

UNIT -I INTRODUCTION: Genome structure and anatomy of prokaryotic and eukaryotic genome – Nuclear genomics – Organelle genomes – Repetitive DNA sequence – Transposable elements– Pseudo genes – Genome databases – organisms-specific databases.

UNIT -II GENOME SEQUENCING: DNA sequencing techniques: Maxam Gilbert method – Sanger’s method – Pyro sequencing – Whole genome sequencing – Gene Contig and Shotgun method – Human genome project.

UNIT -III GENOME ANALYSIS AND ANNOTATION: Searching and locating Genes – Programs and databases – Determining function of genes – Gene Prediction – Methods of gene prediction – Software’s and tools.

UNIT -IV GENOME MAPPING: Mapping databases – Types of mapping – Genetic mapping; DNA markers – RFLP, SSLP, RH maps, SNP – Linkage analysis – Physical mapping; Restriction mapping – FISH – STS mapping

UNIT -V APPLICATIONS OF GENOMICS DNA: microarray and its applications – Medical applications: Development of Antibiotics – Vaccines – Drug discovery – Human genetic diseases: Identification – Gene Diagnosis and Gene therapy– Genomics in Plant Biology.

SKILL DEVELOPMENT

MATERIALS FOR STUDY AND REFERENCE:

- Brown T.A., Genomes 3 (3rd Edn.), Garland Science Publishing, New York, 2007.
- Brown T.A., Gene Cloning and DNA Analysis – An Introduction (6th Edn.), A John Wiley & Sons, Ltd., Publications, UK, 2010.
- Jeremy W. Dale and Malcolm von Schantz, From Genes to Genomes – Concepts and Applications of DNA Technology, John Wiley & Sons, Ltd., Publications, UK, 2002.
- Richard J. Reece, Analysis of Genes and Genomes, John Wiley & Sons, Ltd., Publications, UK, 2004.

Course Code	PROTEOMICS	L	T	P	C
19217AEC32		6	1	0	6

AIM:

- To understand the proteins encoded by the genes with respect to structure, function, protein – protein interactions, techniques for separation and analysis, database and applications.

OBJECTIVE:

- Give a detailed description on protein sequencing.
- Provide an overview of proteome databases.

OUTCOME:

- Gain knowledge on phylogenetic profiles
- Describe the features of Yeast two-hybrid system.

UNIT -I-INTRODUCTION: Proteomics introduction – Protein sequencing – Protein Digestion Techniques – Mass Spectrometers for Protein and Peptide Analysis – Protein Identification by Peptide Mass Fingerprinting – Software Tools for Peptide Mass Fingerprinting: Finding the Matches – Peptide Sequence Analysis and Protein Identification with Tandem Mass Spectrometry

UNIT -II PROTEOME DATABASES: Proteome databases – Comparative proteomics methods – 2D gel databases – Protein interaction data bases – Metabolic pathway databases – resources for interaction prediction – network and pathway visualization tools – Protein network analysis

UNIT -III PROTEOMICS TOOLS : 2D gel electrophoresis and Mass spectra – Protein identification from 2D gel, mass spectra and sequence data – Protein property prediction – bulk, active sites, modification sites, interactive sites, location, localization, stability, shape, domains properties, secondary and tertiary structures – Protein identification programs – Mascot – Peptide – Protein prospector – GFS

UNIT- IV FUNCTIONAL PROTEOMICS Functional proteomics – protein phenotypes – Protein-Protein Interaction Mapping: Experimental – Yeast two-hybrid system – phage display – protein fragment complementation assays – Computational approach

SKILL DEVELOPMENT

UNIT -IV APPLICATION OF PROTEOMICS: Applications of Proteomics – Protein Expression Profiling – Identifying Protein – Protein Interactions and Protein Complexes – Mapping Protein Modifications – Protein Arrays and Protein Chips – Application of proteomics to medicine, toxicology and pharmaceuticals

UNIT -V Current Contours: (For Continuous Internal Assessment only) Computational Proteomics and Metabolomics- Sequence comparison, – Genome sequencing, – Proteomics, – Phylogeny, – Gene expression - Enzymology

MATERIALS FOR STUDY AND REFERENCE

- Baxevanis D and Ouellette BFF, Bioinformatics: A practical guide to the analysis of genes and proteins (3rd Edn.), John Wiley & Sons, Inc. 2005.
- Baxevanis D and Ouellette BFF, Bioinformatics: A practical guide to the analysis of genes and proteins (2nd Edn.), John Wiley & Sons, Inc. 2002.
- Brown TA, Genomes (2nd Edn.), BIOS Scientific Publishers, Oxford, UK, 2002.
- Sensen CW, Essentials of Genomics and Bioinformatics, Wiley-VCH. 2002.
- Sensen CW, Hand book of Genome Research, Wiley-VCH Verlag GmbH & Co,

Course Code	Genomics & Proteomics - lab	L	T	P	C
19217SEC33L		0	0	5	3

AIM:

- The study of animal cells has helped us gain an insight not only in the structure and function of cells and tissues but also in different physiological, biochemical and immunological processes

OBJECTIVE:

- The major objective is to provide a world-class training experience for these students in an interdisciplinary research program connecting animal genomics with animal reproduction and biotechnology.

OUTCOME:

This paper will help students interested in careers as laboratory, research or animal care technicians in the fields of veterinary and human health or biotechnology:

- Isolation of DNA from bacteria, fungus, animal tissues
- Bacterial gene expression
- Restriction mapping
- PCR techniques
- DNA finger printing PFLP,RAPD
- Human Genome -Wellcome Trust Genome Browser
- FlyBase - A Database of Drosophila Genes & Genomes
- Tandem repeats finder- A program to analyze DNA sequences
- Peptide Cutter - Predicts potential cleavage sites cleaved by proteases or chemicals in a given protein sequence
- PSORT - Program for the prediction of protein localization sites in e
- PROSITE - Protein Domain, Family & Functional Site Prediction

SKILL DEVELOPMENT

REFERENCE:

1. DNA cloning I & II by DM. Glover & BD. Hames(1995) IRL press.
2. PCR strategies by MA.Innis, DH.Gelfand & JJ. Sninsky (1995) academic press.
3. Concepts in biotechnology- editors D.Balasubramanian *et al.* university press,(1996).
4. Genetic engineering in animals. A.Puller(ed). VCH publishers.
5. BioEssays- K.K. Jain MD
6. Mapping of Genomes- Eric D. Green, Sue Klapholk.

Course Code	DISCIPLINE SPECIFIC ELECTIVE COURSE-III	L	T	P	C
19217DSC34A	NANOBIOTECHNOLOGY	5	0	0	4

AIM:

- One of major applications of Nano science is in biotechnology field.

OBJECTIVE:

- Nanotechnology attracts students from various disciplines, a single course which starts by sensitizing students from a varied background about the biological/biotechnological basics and culminates into modern day applications of Nano science in biotechnology

OUTCOME:

- This course will act as a bridge between students from non-biology course at all levels

Unit- I

Basic biology principles and practice of micro fabrication techniques, Atomic force microscopy, biological production of metal Nano particles, macro molecular assemblies.

Unit-II

Application in Biomedical and biological research, Nano particles, viruses as Nano- particles, Nano chemicals and application, tumour targeting and other diagnostic application.

Unit-III

Developing drug delivery tools through Nano biotechnology, Nano particle based immobilization assays, quantum dots technology and its application.

Unit-IV

Synthesis and characterization of different classes of biomedical polymers their uses in pharmaceutical, cardiovascular ophthalmologic orthopaedic areas.

EMPLOYABILITY/ ENTREPRENEURSHIP /SKILL DEVELOPMENT

Unit-V

Biosensors and Nano biotechnology principles used in construction of microelectronic devices sensors and macro mechanical structures. And their functioning, immunonanotechnology.

Text Book:

- Nano Biotechnology by Balaji, Subbaih

Reference Books:

- Nanobiotechnology- concepts, applications and perspectives, niemeyer, christofm. Mirkin, chad a, wiley publishers.
- Nanobiotechnology of biomimetic membranes, martin, donald (edt), springer verlag publishers.

Course Code	DISCIPLINE SPECIFIC ELECTIVE COURSE-III	L	T	P	C
19217DSC34B	Environmental biotechnology	5	0	0	4

AIM:

- To understand the energy sources, environmental pollution and remediation using biotechnology and its control.

OBJECTIVE:

- Students will get an idea about the hazards to our environment, solutions to protect and for sustainable development.

OUTCOME:

- This course is important in the era of industrialization leading to environmental hazards and hence will help students to take up a career in tackling industrial pollution and also who is willing to take up the research in areas like development of biological systems for remediation of contaminated environments (land, air, water), and for environment-friendly processes such as green manufacturing technologies and sustainable development.

Unit I

Introduction, Importance and Scope of Environment Biotechnology. Renewable and Non-Renewable Resources of Energy. Conventional fuels and their impact on Environment – Firewood, Animal wastes, Coal, Petroleum and Animal oils.

Unit II

Modern fuels and their impact on environment – Methanogenic Bacteria, Biogas Production, Microbial Hydrogen Production, Conversion of Sugar to Alcohol, Gasohol. Effect of Green Revolution and Industrial Revolution on Environment.

Unit III

Waste Water Pollution (Sewage) Treatment Process - Septic tank, Mechanical and Biological Treatment, Trickling Filters, Activated Sludge Process, Oxidation Ponds, Anaerobic Sludge Digestion, Solid Waste Disposal- Sanitary Landfills, Composting, Vermicompost

Unit IV

Biofertilizers- Definition, Distinguished Features of bio fertilizers and Organic Manures, Role of symbiotic and asymbiotic nitrogen fixing bacteria in the enrichment of soil, Alga and fungal biofertilizers (VAM)

Unit V

Bioleaching- Ore Leaching and Role of Microbes in Mines (copper, and Uranium), Environmental significance of Genetically modified microbes, plants and animals, Bio-assessment of environmental quality

EMPLOYABILITY/ENTREPRENEURSHIP/SKILL DEVELOPMENT

Text Book:

- Fundamental of Environmental Studies by Bhargava, D.S

Reference Books:

- John E Smith – Biotechnology, Cambridge University Press
- Prescott & Dunn - Industrial Microbiology, AVI publishing Co, USA
- Mukerji, Singh & Garg - Frontiers in applied Microbiology, Prink House India, Lucknow Pepler & Perlman – Microbial Technology, Academic Press, New York
- Nicholas C Price – Fundamentals of Enzymology Chaplin & Bueke – Enzyme technology
- Moses and Capes – Biotechnology- the Science and Business

Course Code	Course Title	L	T	P	C
19211OEC	Open Elective -Writing for the Media	4	0	0	2

Aim:

- To equip students to enter the realm of mass media.

Objectives:

- To help students to understand the intricacies of mass media
- To know about the barriers to mass communication
- To understand the function of mass media
- To learn the different kinds of news
- To enhance the different kinds of writing for media

Outcome:

- Understand the intricacies of mass media

UNIT-I

Mass communication- Barriers to mass communication and mass culture- Function of mass media - Media effects, Qualities of media men.

UNIT-II

News- Hard and soft news- Expected and unexpected news- Box news- Follow up news-Scoop-Filters- Human interest stories- Recognizing and evaluating news.

UNIT-III

News and views- News analysis, Editorial, Columns, Article, Middle reviews, Letters-Features.

UNIT-IV

Reporting- Crime, Court, Election, Legislature, Sports, Development Investigative, Interpretative depth.

UNIT-V

Writing for Media-Inverted pyramid style-Feature style-TV/Broadcast, New style writing TV/Radio Documentaries- Writing Advertisements-Practical

References-

Journalism	-Susan
Professional Journalism	-John Hogenberg
News Writing and Reporting	-M.James Neal (Surjeet Publication)
Professional Journalism	-M.V Komath
The Journalist's Handbook	-M.V Komath
Mass Communication & Journalism	-D.S Mehta,

Course Code	Course Title	L	T	P	C
19212OEC	Open Elective – Applicable Mathematical Techniques	4	0	0	2

Aim:

- To acquaint with the basic concept of Interpolation.

Objectives:

- Understand the basic concept of Interpolation.
- To enhance the knowledge about Assignment Problems, Replacement Problems, Decision Analysis and Game Theory.

Outcomes:

- Students using OR techniques in business tools for decision making
- Students develop Assignment problem and Replacement problems
- Understand the concept of decision analysis and game theory
- Students gets the knowledge about interpolation

UNIT I

Interpolation with unequal intervals: Newton's, Lagrange's, and inverse interpolation

UNIT II

Assignment Problems

UNIT III

Replacement Problems

UNIT IV

Decision Analysis

UNIT V

Game Theory

References

Unit I, "Numerical Methods in Science and Engineering" M.K.Venkatraman

Units II to V, "Operations Research", Kantiswarup, P.K. Gupta and Manmohan

Course Code	Course Title	L	T	P	C
19213OEC	Open elective Biomedical Instrumentation	4	0	0	2

Aim:

- To understand the concepts and application of electronic Instrumentation in the Medical field.

Objective:

- Interpret technical aspects of medicine
- Solve Engineering Problems related to medical field
- Understand medical diagnosis and therapy

Outcomes:

- To familiarize students with various medical equipments and their technical aspects
- To introduce students to the measurements involved in some medical equipment.
- Ability to understand diagnosis and therapy related equipments
- Understanding the problem and ability to identify the necessity of an equipment to a specific problem

UNIT – I: Bio Electric Signals and Electrodes

Fundamentals of medical instrumentation – Sources of biomedical signals – basic medical instrumentation – Intelligent medical instrumentation system – Origin of Bio electric signals – Recording Electrodes – Silver – Silver chloride electrodes – Electrodes for ECG – Electrodes for EEG – Electrodes for EMG.

UNIT – II: Recording System and Recorders

Basic recording system – General consideration for signal conditions – Preamplifiers – Biomedical signal analysis technique – main amplifier and driver stage – Writing systems – direct writing recorders – the ink jet recorders – Electrocardiograph, Electroencephalograph – Electromyography and other Biomedical recorders.

UNIT – III: Measurement and Analysis Techniques

Electro cardiography – measurements of Blood pressure - measurements of Blood flow and cardiac output, Respiratory therapy Equipment – Origin of EEG – Action Potentials of the brain – evoked potentials – Placement of electrodes – Recording set up – Analysis of EEG.

UNIT – IV: Magnetic Resonance and Ultrasonic Imaging Systems

Principles of NMR Imaging system – Image reconstruction Techniques – Basic NMR components – Biological efforts of NMR Imaging – Advantages of NMR Imaging System – Diagnostic ultra Sound – Physics of ultrasonic waves – medical ultra sound – basic pulse – echo apparatus, A – Scan – echocardiograph(M mode).

UNIT – V: Advanced Bio Medical Systems

Pacemakers – Need for Cardiac pacemaker – External Pace makes – Implantable Pace makers – recent development in Implantable Pacemakers – Pacing system Analyzer – Defibrillator – Pacer – Cardioverter – Physiotherapy and electro therapy equipment – High frequency heat therapy – short wave diathermy – microwave and ultrasonic therapy – pain relief through electrical stimulation.

Books for Study

1. R.S Khandpur, Handbook of Biomedical instrumentation, Tata McGraw Hill publishing company Limited. New Delhi, (2003). (Unit I,II,IV & V)
2. Lestlie Cromwell, Fred J. Weibell, Erich A. Pfeiffer, Bio medical instrumentation and measurements, PHL, New Delhi.(Unit-III)

Book for Reference

1. M.Arumugam, Biomedical Instrumentation, Anuradha Agencies, Kumbakonam (2000).

Course Code	Course Title	L	T	P	C
19214OEC	Open Elective-Green Chemistry	4	0	0	2

Aim:

- To reduce the soil and water pollution in environment.

Objectives:

- To learn about the environmental status, public awareness in evolution, principles involved in green chemistry, bio-catalytic reactions, global warming and its control measures, availability of green analytical methods.

Outcomes:

- To understand the environmental status and evolution.
- To know about the Pollution and its prevention measures.
- To familiarize the green chemistry.
- To learn about the bio-catalytic reactions.
- To understand about the vitamins and antibiotics.

Unit I - Introduction

Introduction-Current status of chemistry and the Environment-Evolution of the Environmental movement: Public awareness - Dilution is the solution to pollution-Pollution prevention.

Unit II - Principles

Green Chemistry – Definition – Principles of Green Chemistry - Why is this new area of Chemistry getting to much attention - Why should chemist pursue the Goals of Green Chemistry - The roots of innovation – Limitations.

Unit III - Bio Catalytic Reactions

Green Chemistry Using Bio Catalytic Reactions – Introduction - Fermentation and Bio transformations - Production of Bulk and fine chemicals by microbial fermentation Antibiotics – Vitamins - Bio catalysis synthesis of industrial chemicals by bacterial constructs - Future Trends.

Unit IV - Green House Effect

Greenhouse effect and Global Warming – Introduction - How the greenhouse effect is produced - Major sources of greenhouse gases - Emissions of CO₂ - Impact of greenhouse effect on global climate - Control and remedial measures of greenhouse effect - Global warming a serious threat - Important points.

Unit V - Green Analytical Methods

Future trends in Green Chemistry - Green analytical methods, Redox reagents, Green catalysts; Green Nano-synthesis, Green polymer chemistry, Exploring nature, Biomimetic, Proliferation of solvent-less reactions; Non-covalent derivatization, Biomass conversion, emission control

References:

- Introduction to Green Chemistry – M.Rayan and M.Tinnes
- New Trends in Green Chemistry – V.K.Ahluwalia and M.Kidwai

Course Code	Course Title	L	T	P	C
19220OEC	Open Elective-M- Marketing	4	0	0	2

Aim:

- To provide the conceptual and technological developments in the field of internet and web designing with the emphasis on comprehensive knowledge of internet.

Objectives:

- To understand the web designing and web development with the knowledge of internet.
- To learn the overview of the design of HTML & Scripting Languages.
- To learn the use of website and internet design and development.

Outcomes:

- Acquire knowledge about functionalities of Internet
- Acquire knowledge about functionalities of world wide web
- Explore markup languages features and create interactive web pages using them
- Learn and design Client side validation using scripting languages
- Acquire knowledge about Open source JavaScript libraries
- Able to design front end web page and connect to the back end databases.

UNIT I

Internet, Growth of Internet, Owners of the Internet, Anatomy of Internet, ARPANET and Internet history of the World Wide Web, basic Internet Terminology, Net etiquette, Internet Applications – Commerce on the Internet, Governance on the Internet, Impact of Internet on Society – Crime on/through the Internet. Connectivity types: level one, level two and level three connectivity. Setting up a connection: hardware requirement, selection of a modem, software requirement, modem configuration, Internet accounts by ISP: Telephone line options, Protocol options, Service options, Telephone line options – Dialup connections through the telephone system, dedicated connections through the telephone system, ISDN, Protocol options – Shell, SLIP, PPP, Service options – E-mail, WWW, News Firewall

UNIT II

Network definition, Common terminologies: LAN, WAN, Node, Host, Workstation, bandwidth, Interoperability, Network administrator, network security, Network Components: Servers, Clients, Communication Media, Types of network: Peer to Peer, Clients Server, Addressing in Internet: DNS, Domain Name and their organization, understanding the Internet Protocol Address. Network topologies: Bust, star and ring, Ethernet, FDDI, ATM and Intranet.

UNIT III

Email Networks and Servers, Email protocols –SMTP, POP3, IMap4, MIME6, Structure of an Email – Email Address, Email Header, Body and Attachments, Email Clients: Netscape mail Clients, Outlook Express, Web based E-mail. Email encryption- Address Book, Signature File.

UNIT IV

HTML page structure, HTML Text, HTML links, HTML document tables, HTML Frames, HTML Images, multimedia - ASP, VB Script, JAVA Script, JAVA and Front Page, Flash

UNIT V

Overview, SGML, Web hosting, HTML, CGL, Documents Interchange Standards, Components of Web Publishing, Document management, Web Page Design Consideration and Principles, Search and Meta Search Engines, WWW, Browser, HTTP, Publishing Tools Overview of Internet Security, Firewalls, Internet Security, Management Concepts and Information Privacy and Copyright Issues, basics of asymmetric cryptograms,

Text Book

World Wide Web design with HTML – C. Xavier – Tata McGraw – Hill – 2000.

References

1. Greenlaw R and Hepp E "Fundamentals of Internet and www" 2nd EL, Tata McGrawHill, 2007.
2. Ivan Bayross, "HTML, DHTML, JavaScript, Perl CGI", 3rd Edition, BPB Publications.
3. D. Comer, "The Internet Book", Pearson Education, 2009.
4. M. L. Young, "The Complete reference to Internet", Tata McGraw Hill, 2007.
5. Godbole AS & Kahate A, "Web Technologies", Tata McGrawHill, 2008.
6. Jackson, "Web Technologies", Pearson Education, 2008.
7. B. Patel & Lal B. Barik, "Internet & Web Technology", Acme Learning Publishers.
8. Leon and Leon, "Internet for Everyone", Vikas Publishing House.

Course Code	Course Title	L	T	P	C
19261OEC	Open Elective-Insurance Services	4	0	0	2

Aim:

- To look after the interests of people from uncertainty by providing certainty of compensation.

Objectives:

- To learn the fundamental concepts and principles of insurance.
- To explain the nature of different insurance policies, insurance contracts and settlement of claims.

Outcome:

- The course helped the students to learn the principles of Insurance and the functions of Life and general insurances and the IRDA

UNIT – I

Insurance and Assurance – Importance of Insurance – Functions of Insurance – Insurance contract and their Elements – Fundamental Principles of Insurance contracts

UNIT – II

Types of Insurance contracts – Differences between Life and General Insurance – Concepts in Insurance - Insurer, Insured, Premiums and Claims – Reinsurance – Double Insurance

UNIT – III

Life Insurance – Advantages of Life Insurance – Procedure for Effective Life Insurance – Risk Factors in Life Insurance – Procedure for Settlement of Life Insurance Claims – Different kinds of Life Insurance Policies including Endowment and whole Life Policies.

UNIT – IV

General Insurance – Fire Insurance – Contract of Fire Insurance – Fire Policy Conditions – Subject matter of Fire Insurance – Fire Policy – Marine Insurance – Motor, burglary and Personal Accident Insurance.

UNIT – V

Reforms in Insurance Sector – principles and Types – I.R.D.A., Privatisation of Insurance – Insurance and Employment – Insurance Agents and career Agents – Investments by Insurance companies in housing sector and other infrastructure projects.

Reference Books:

Dr.MR.Mishra – Law of Insurance – Central Law Agency Allahabad

Dr.M.M.Verma & R.K.Agarwal – Insurance

Pandy & Ratogi – Insurance

M.N.Mishra & S.Chand - Principles and Practice of Insurance

Course Code	Course Title	L	T	P	C
19280OEC	Open Elective-Counselling Psychology	4	0	0	2

Aim:

- To acquaint with counselling and its process

Objectives:

- To learn the fundamental concepts of counselling.
- To know the nature of different determinates
- To familiarize with the approaches of counselling

Outcome:

- Learn counselling and its process

UNIT I

Definition of Counselling

Counselling as a Solution to Human Problems

Counselling-Expectations & Goals

UNIT II

Personality Determinates, Intellectual Determinates, Emotional Determinates

Social Determinates

UNIT III

Approaches to Counselling

Counselling Process

UNIT IV

Psychological Testing

Diagnosis

UNIT V

Educational Counselling

Family Counselling

References Book:

1. Hanson, J.C. Stevic, R.R., Warner, R.W., Jr. *Counselling Theory & Process* (2nd Edition) Boston
2. Hurlock Elizabeth B. (2007), *Human Development*, New York, Grawhill Book Company
3. John W. Santrock (1999), *Life Span Development*, 7th Edition, New Delhi: Mcgrowhill Company
4. Blum And Bolimsky, B. *Counselling & Psychology*; Bomboy; Asia Publishing House, 1961
5. Bordin, E.S. *Psychology of Counselling* New York; Application Century Crafts, 1968
6. Lewis E. C., *the Psychology of Counselling* New York Holt, Rinchart and Winston Inc. 1970

Course Code	FOOD TECHNOLOGY	L	T	P	C
19217AEC41		6	1	0	6

- Aim: This course aims to help the students to understand the various properties of food and the factors that make it vulnerable for spoilage

Objectives:

- This course is designed to understand the chemical nature and associated microbes of food and to understand the principles of food processing, preservation and manufacture.

Outcomes:

- To understand the basic food safety issues in the food market
- To develop and evaluate quality of new food products using objective and subjective methodologies.
- To understand the basic concepts in food chemistry and food analysis

Unit I

Basics of Food Technology Food chemistry: constituents of food - contribution to texture, flavour and organoleptic properties of food, Food additives - nutritional and commercial and their functions, Enzymes in food processing

Unit II

Microbiology of Food Sources and activity of microorganisms associated with food, Food fermentation & food chemicals, Food borne diseases - infections and intoxications, Food spoilage - causes

Unit III

Food Processing Raw material characteristics; cleaning, sorting and grading of foods; physical conversion operations - mixing, emulsification, extraction, filtration, centrifugation, membrane separation, crystallization, heat processing

Unit IV

Food Preservation Use of high temperatures - sterilization, pasteurization, blanching, canning - concept, procedure & application; Low temperature storage - freezing curve characteristics, Factors affecting quality of frozen foods, Irradiation preservation of foods

Unit V

Manufacture of Food Products Bread and baked foods, Dairy products - milk processing, cheese, butter, ice-cream, Vegetable and fruit products, Edible oils and fats, Meat, poultry and fish products, Confectionery, beverages

EMPLOYABILITY/ENTREPRENEURSHIP/SKILL DEVELOPMENT

Reference Books

1. Crosby, N.T. 1981. Food packaging Materials: Applied Science Publishers, London.
2. David, S. Robinson. 1997. Food Chemistry and nutritive value. Longman group, UK.
3. Frazier, W.C. and Westhoff, D.C. 1988. Food Microbiology.

Course Code	Course Title	L	T	P	C
19217AEC42	BIOINSTRUMENTATION	6	1	0	6

Aim:

- The students searching for Biomedical Instrumentation Courses and Training Programs found the following related articles

Objectives:

- This course will give an understanding about the working principles, construction and applications of the instruments often used in the studies related to various disciplines of Biological Sciences.

Outcomes:

- Check for analytical functions and find the analytical function and study.
- Learn the measurement systems, errors of measurement.
- Demonstrate basic knowledge of Bio techniques

Unit I

Basic Instrumentation (Theory & Demo) Principles, operation protocol & applications of the following instruments: Weighing balance, pH meter, Polarography, Radioactivity, ECG, FTIR.

Unit II

Microscopy (Hands on) Observation of different microbes, Light – Bright & Dark field; Phase contrast, Inverted Phase contrast; Fluorescent, Electron – TEM & SEM; Confocal

Unit III

Spectroscopy (Theory & Demo) Colorimeter, Spectrometer, UV visible spectrometer, X – ray spectrometer, ELISA reader, Atomic absorption spectrometer, Flame photometer, Fluorimeter & Spectro fluorimeter.

Unit IV

Separation Techniques (Theory & Demo) Centrifugation - Principle, operation, types & applications. Chromatography - Principle, operation & applications - Paper – ascending, descending & Circular, TLC, HPTLC, GC, HPLC, Column Chromatography, Ion Exchange & Affinity Chromatography, LC – MS.

Unit V

Electrophoresis (Theory & Demo) Native & denatured - zone, iso-electrofocusing & isotachopheresis, 1D & 2D, PCR, MaldiToF

Reference Books:

- S.SadasivamA. Manickam. 2004. Biochemical Methods.
- 2nd Edition, New Age International (p) Ltd, Publishers. 2. Dr. G.Rajagopal, Dr. B.D.Toora. 2005. Practical Biochemistry. 2nd Edition. Ahuja Book Company Pvt.Ltd.
- J.Jaysraman. 2000. Laboratory Manual in Biochemistry. New Age International Publishers.

Course Code	Course Title	L	T	P	C
19217SEC43L	FOOD TECHNOLOGY AND BIO INSTRUMENTATION LAB	0	0	5	3

Aim:

- To understand the principle and application of Bioinstrumentation and food technology

Objectives:

- By doing this course the students will get hand on exposure & understand the chemical nature and associated microbes of food and the principles of food processing, preservation and manufacture. And the techniques used in understanding the biological process

Outcomes:

- Ability to apply principles of food engineering in industry.
- Understand, identify and analyze a problem related to food industry and ability to find an appropriate solution for the same.

- Test for sensitivity of microorganisms
- Downstream processes of enzymes – dialysis
- Ion exchange chromatography – drying – cellulose column chromatography
- Immobilization of yeast cell by alginate beads
- Biossxy techniques for antibiotics
- Large scale production of organic acids, large scale production of solvents using fermenter (Demo)
- Visit to Distillery unit; alcohol production and pharmaceutical industries, Pasteur Institute (Field visit)
- Isolation & identification microbes from spoiled food
- Production of yogurt, butter
- Antibiotic production by different strains of microbes (Theory)
- Calculate BME
- Handling of Colorimeter and Spectrophotometer
- Estimation of RNA by orcinol method
- Estimation of DNA by Diphenylamine method
- Paper chromatography for separations and detections of simple sugars and amino acids
- Separation of plant pigments by column chromatography
- Thin layer chromatography of amino acids

EMPLOYABILITY/ENTREPRENEURSHIP /SKILL DEVELOPMENT

Reference book:

- Laboratory Manual in Biochemistry by J. Jayaraman. New Age International Publishers. 2nd Edn. 1981.
- Stanbury, P.F., A. Whitaker and S.J. Hall. 1995. Principles of fermentation Technology, Pergamon, UK.

Course Code	Course Title	L	T	P	C
19217 DSC44A	GENE THERAPY UTILIZATION PHARMACOLOGY	5	0	0	4

Aim:

- After successful completion of the paper the students will get an overall view about genetic makeup of organisms and can take up a career in research.

Objective:

- This paper in genetics has been structured to give the student an in depth knowledge of the organization of the genome in prokaryotes and eukaryotes, the principles of genetic inheritance and other vital aspects such as Hardy Weinberg law, pedigree analysis and the genetic basis of disease inheritance.

Outcomes:

- understand some of the types of disease that might be treatable by gene therapy
- understand the basic principles of genetic manipulation
- Understand how genetics may be used in the design of drugs..

UNIT I: History of genetics

Gene as the unit of mutation and recombination. Identification of DNA as the genetic material. Mutations: Molecular nature, mutagenesis by nitrous acid, hydroxylamine, alkylating agents, intercalators and UV, origin of spontaneous mutations and control, parasexual process in bacteria, transformation, transduction and conjugal gene transfer the phenomena, mechanisms and applications. Fine structure genetic analysis with examples.

UNIT II: Genetic mapping

Haplotype, Physical and Cytogenetic mapping, SNP, RFLP, TRE, PCR-OLA, SSCP, RAPD

UNIT III: Identifying human disease genes

General gene therapy strategies, Targeted killing of specific cells, Targeted mutation correction, Targeted inhibition of gene expression. Gene replacement therapy by viral vectors: Oncovirus, Lenti virus, Adenovirus, Adeno associated virus, Herpes Simplex virus, Naked DNA or direct injection or particle bombardment-gene gun, Liposome mediated DNA transfer, Receptor mediated endocytosis, Repair of mutations in situ through the cellular DNA repair machinery, Antisense induced exon splicing, In-utero fetal gene therapy

UNIT IV: Gene blocking therapies

Gene Knockouts, Gene disruption-p53, prion diseases, immunological, short RNA, Gene therapy for non-inheritable diseases, stem cell therapy, somatic cell gene therapy and germ line gene therapy

UNIT V: Gene therapy: problem, solutions and future prospects

Controversial issues in medical genetics

In vitro fertilization, Prenatal sex determination, Surrogate therapy, Genetic counseling, Germline gene therapy, ELSI, NBAC, IPR, Patenting, Human transgene

SKILL DEVELOPMENT

Reference Books:

- Human Molecular Genetics- Tom Strachan
- Concepts of Genetics- William s. Klug
- Emery's Elements of Medical Genetics- Robert F. Mueller & Ian D. Young
- Concepts of Genetics – W.S. Klug and M.R. Cummings Prentice Hall, 1997.
- Introduction of Genetic Analysis of Griffiths – Freeman Co., 1996.

Course Code	Course Title	L	T	P	C
19217 DSC44B	PLANT CONSERVATION & DISASTER MANAGEMENT	5	0	0	4

Aim:

- Understanding foundations of hazards, disasters and associated natural/social phenomena.

Objective:

- To maintain essential ecological processes and life supporting systems.
- To preserve the diversity of species or the range of genetic material found in the worlds organisms.
- The course focuses on the reasons responsible for disaster, its impact on the environment and society. To impart the knowledge on the measures and steps to minimise or overcome the burden on the ecosystem.

Outcomes:

- To make sustainable utilization of species and ecosystems.
- Familiarity with disaster management theory (cycle, phases) Knowledge about existing global frameworks and existing agreements (e.g. Sendai)

UNIT I: Plant Diversity

Biodiversity – Concept and Definition Scope and Constraints of Biodiversity Science, Composition and Scales of Biodiversity: Genetic Diversity, Species/ Organismal Diversity, Ecological/ Ecosystem Diversity, Landscape/ Pattern Diversity, Agrobiodiversity, Biocultural Diversity and Urban Biodiversity.

UNIT II: Conservation challenges in the twenty first century

Urbanisation, Creating knowledge society, Conflict management and decision making, Management of introduced species, 18 Evaluation of priorities for conservation of habitats and species Selection criteria for protection of species – species quality, IUCN Guidelines for Red List categories and criteria (version 7.0), Red List of Indian Flora and Fauna, Selection criteria for protection of habitats – hotspots, Conservation

UNIT III: Introduction to Disasters

Natural Disasters –Educative – Trends in Climatology, Meteorology and Hydrology, Seismic Activities, Changes in Coastal Zone, Coastal Erosion, Beach Protection, Coastal Erosion due to Natural and Manmade Structures

UNIT IV : Types of Disasters – Natural

Disasters – Nature and characteristics of Cyclones – Tornadoes – Avalanches – Flood –Drought – Volcanic – Earthquakes – Fire – Landslides – Causes and effects - Impact on Environment- Forecasting and Warning System – Disaster Profile of India. Manmade disasters: Nuclear, chemical, fire explosion, accidents, bioweapons. Deforestation, monoculture, Building construction.

UNIT V : Disaster Management

Disaster Management Cycle- Pre-disaster Planning -Training of Disaster – Prone Areas – Prioritization – Regulations – Protection Measures during Disaster and Post Disaster. Relief Camp Organization – Disaster Training – Role of Information and Communication Technology, GPS, Remote Sensing and Geographic Information System in Disaster Management.

EMPLOYABILITY/ENTREPRENEURSHIP /SKILL DEVELOPMENT

REFERENCES:

- Hambler C and SM Camly, (2013). Conservation. Cambridge University Press
- Van Dyke F, (2008). Conservation Biology Foundations, Concepts, Applications 2nd Edition, Springer
- Natural Hazards, Bryant Edwards (2005), Cambridge University Press, U.K.
- Space Technology for Disaster management: A Remote Sensing & GIS Perspective, Roy, P.S, (2000), Indian Institute of Remote Sensing (NRSA), Dehradun.
- Natural Disaster, Sharma, R.K. & Sharma, G. (2005), (ed) APH Publishing Corporation, New Delhi


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Mapping of courses to Cross cutting Issues



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SCHOOL OF ARTS AND SCIENCE
REGULATION 2019
DEPARTMENT OF BIOTECHNOLOGY

Programme Name and Code	Course code	Title of the Course	Cross cutting Issues				
			Professional Ethics	Gender Sensitization	Human Values	Environment and Sustainability	
B. Sc (19UGBTGE)	19117AEC23	Cell Biology and Genetics			*		
	19117AEC33	Plant Physiology				*	
	19117AEC35	Immunology			*		
	19117AEC36L	Immunology Lab			*		
	19ENV1STU	Environmental Studies				*	
	1917AEC43	Animal Physiology			*		
	19117AEC44L	Animal Physiology Lab			*		
	19117AEC51	Developmental Biology			*		
	19117SEC52	Cell and Tissue culture				*	
	19117AEC54L	Developmental Biology and Tissue culture Lab			*	*	
	19117AEC62	Applied Biotechnology			*		
	19117DSC65A	Environmental Biotechnology				*	
	19117DSC65B	Environmental Management				*	
	M. Sc (19UGBTGE)	19217SEC12	Molecular Genetics				
		19217DSC15A	Immunology			*	
19217DSC15		Biosafety and biodiversity				*	
19217SEC21		Cell & Molecular Biology			*		
19217SEC23		Industrial Biotechnology	*				
19217DSC25B		Bioethics and IPR	*				
19217SEC24L		Molecular Biology & Industrial Biotechnology - Lab	*				
19217AEC31		Genomics			*		
19217AEC32		Proteomics			*		

Mapping of courses to Cross cutting issues

	19217SEC33L	Genomics & Proteomics - Lab			*	
	19217DSC34B	Environmental biotechnology				*
	19217AEC41	Food Technology			*	
	19217DSC44B	Plant conservation & disaster management				*



Head of the Department
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DEPARTMENT OF BIOTECHNOLOGY

CERTIFICATE COURSE SYLLABUS

ACADEMIC YEAR 2019-2020

TOOLS IN BIostatISTICS

Subject Code: 19517TIB

COURSE OUTCOME

- ✓ Develop the ability to apply the methods while working on a research project work
- ✓ Describe the appropriate statistical methods required for a particular research design
- ✓ Choose the appropriate research design and develop appropriate research hypothesis for a research project

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; discrete and continuous data. Collection and scrutiny of data: Primary data; designing a questionnaire and a schedule

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, F-test, testing of two variance of two univariate normal population.

UNIT 3:

Statistical techniques: Correlation: Pearson product moment correlation, Spearman rank correlation, Partial correlation, Simple linear regression, Two way ANOVA, Multivariate ANOVA, Analysis of Covariance, Repeated measures.

UNIT 4:

Introduction to Regression : **Multiple Regression:** Multiple linear regression and correlation - Model building and selection - Interpreting regression coefficients and confidence intervals - Quantifying and dealing with multicollinearity - Power Analysis for linear regression;

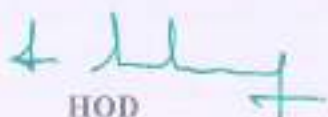
UNIT 5:

Decision Trees: Introduction to SPSS Decision Trees - Application of SPSS Decision Trees - Overview of decision tree based methods (CRT Decision Trees CRT Regression Trees Quest 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.



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DEPARTMENT OF BIOTECHNOLOGY

CERTIFICATE COURSE SYLLABUS

ACADEMIC YEAR 2019-2020

BIOMEDICAL – INSTRUMENTATION

Subject code: 19517BIM

UNIT – I:

Fundamentals of medical instrumentation – Sources of biomedical signals – basic medical instrumentation – Intelligent medical instrumentation system – Origin of Bio electric signals – ECG – Electrodes for EEG – Electrodes for EMG.

UNIT – II:

Electrocardiograph, Electroencephalograph, Measurement of blood pressure - Cardiac output - Heart rate - Heart sound - Pulmonary function measurements.

UNIT – III

Electrodes – Limb electrodes – floating electrodes – pregelled disposability electrodes - Micro, needle and surface electrodes – Amplifiers, Preamplifiers, differential amplifiers, chopper amplifiers.

UNIT – IV:

Principles of NMR Imaging system – Image reconstruction Techniques – Basic NMR components – Biological efforts of NMR Imaging – Advantages of NMR Imaging System – Diagnostic ultra Sound – Physics of ultrasonic waves.

UNIT – IV:

Radio graphic and fluoroscopic techniques – Computer tomography – MRI – Ultrasonography – Endoscopy – Thermography – Different types of biotelemetry systems - Retinal Imaging - Imaging application in Biometric systems.

Course outcome

1. Ability to understand the philosophy of the heart, lung, blood circulation and ability to provide latest ideas on devices of non-electrical devices.
2. Ability to gain knowledge on various sensing and measurement devices of electrical origin.
3. Ability to understand the analysis systems of various organ types. Ability to bring out the important and modern methods of imaging techniques and their analysis.

4. Ability to explain the medical assistance/techniques, robotic and therapeutic equipments.
5. The Instrumentation Technology certificate will develop entry-level skills in industrial instrumentation, maintenance and calibration.

Books Reference

1. R.S Khandpur, Handbook of Biomedical instrumentation, Tata McGraw Hill publishing company Limited, New Delhi,(2003). (Unit I,II,IV & V).
2. Leslie Cromwell, "Biomedical Instrumentation and Measurement", Prentice Hall of India, New Delhi, 2007.
3. Lestlie Cromwell, Fred J. Weibell, Erich A. Pfeiffer, Bio medical instrumentation and measurements, PHI, New Delhi.(Unit-III).
4. Khandpur R.S, Handbook of Biomedical Instrumentation, Tata McGraw-Hill, New Delhi,2nd edition, 2003
3. Joseph J Carr and John M.Brown, Introduction to Biomedical Equipment Technology, John Wiley and sons, New York, 4th edition, 2012.

Journal reference

1. John G. Webster, Medical Instrumentation Application and Design, John Wiley and sons, New York, 1998.
2. Duane Knudson, Fundamentals of Biomechanics. Springer, 2nd Edition, 2007.
3. Suh, Sang, Gurupur, Varadraj P., Tanik, Murat M., Health Care Systems, Technology and Techniques. Springer, 1st Edition, 2011.
4. Ed. Joseph D. Bronzino, The Biomedical Engineering Hand Book, Third Edition, Boca Raton, CRC Press LLC, 2006.
5. M.Arumugam, 'Bio-Medical Instrumentation', Anuradha Agencies, 2003.


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DEPARTMENT OF BIOTECHNOLOGY

CERTIFICATE COURSE SYLLABUS

ACADEMIC YEAR 2019-2020

CELL CULTURE TECHNIQUE

Subject Code: 19517CCT

COURSE OUTCOME

1. The students learnt to maintain cultures of plant and animal cell with good viability.
2. Gained knowledge about preparation, storage of cultures and developed their ideas to carry the research work.

UNIT-1: Biology of cultured cells techniques and safety protocols

Introduction of cell culture technology-philosophy and complexity in cell culture-to grow the cell outside the body-cell cycle concept-dividing cells. Biology of cell culture-layouts & designs of cell culture facility-Precautions during designing the lab layout.

UNIT-2: Culture vessels & media development

State of art facility in cell culture lab-specialized facility in cell culture lab-interaction of cell and polycarbonate surface. Poly D lysine deposition-surface chemical analysis- cell growth process-cell surface interface-cell culture substrate patterning.

UNIT-3: Primary culture, secondary culture, cloning & selection

Introduction to define system-mechanical dissociation of hippocampal tissue-rules for mechanical dissociation of tissue-drum molecule testing-adult hippocampal neuron dissociation

UNIT-4: Cell separation and culture mode

Cell separation, characterization, differentiation & transformation of cells. In vitro myelination cell culture mode. Contamination, cryo-preservation & cyto-toxicity.

UNIT-5: Organo-typic culture & specialized techniques

Fluorescent assisted cell sorting-condition for regenerated cells-introduction of skeletal muscle cell culture and cardiac muscle cell culture. Organo-typic culture & specialized techniques. Advance cell culture technique:

REFERENCE

1. Animal Cell Culture: Concept and Application. Sheelendra M. Bhatt,2011.

2. General Techniques of Cell Culture. Ian F. Rae and Maureen A. Harrison,1997.
3. Atlas of Living Cell Cultures. Rosemarie Steubing and Toni Lindl,2013.
4. Animal Cell and Tissue Culture. Shivangi Mathur,2009.
5. Animal Cell Culture: A Practical Approach. John Masters,2000.



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SCHOOL OF ARTS AND SCIENCE
DEPARTMENT OF COMPUTER SCIENCE

MINUTES OF BOARD OF STUDIES MEETING OF COMPUTER SCIENCE

The Minutes of the Board of Studies meeting in Computer Science was held on 10-04-19 by 10.30 a.m. in Department of Computer Science, PRIST University, Thanjavur under the chairmanship of Dr.K.Saravanan, Head of the Department of Computer Science.

The following Members were present for the meeting:

Dr.L.Chinnappa	Dean of Arts and Science	Internal Member
Dr.K.Saravanan	Professor and Head	Chairman
Dr.R.Maruthi	Professor	Internal Member
Dr.AV.Secchafakshmi	Professor	Internal Member
Dr.G.Preethi	Associate Professor	Internal Member
Dr.K.Raja	Associate Professor	Internal Member
P.Karthik	Assistant Professor	Internal Member
G.Gayathri	Assistant Professor	Internal Member
Dr.N.E.Gopalan	Professor, NIT Trichy	Subject Expert, External Member
S.Senthil Kumar	Team Lead, Mahindra InfoTech	Industry Expert, External Member
B.Anandh	B.C.A	Alumni
A.Rahul	B.Sc.(CS)	Student

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Thanjavur - 613 403, Tamilnadu

Dean of Arts & Science
PRIST Deemed to be University
Thanjavur - 613 403, Tamilnadu

The Chairman of Board of Studies in Computer Science Welcomed the members and briefed them about the programmes offered by the department and the existing Syllabi for the programmes offered.

After thorough review of existing curriculum and syllabi for various programmes offered by the department and also the feedback on curriculum collected from various stakeholders during 2019-20, the members of the Board of studies have unanimously passed the following resolutions.

The Following new courses are introduced in the Academic year 2019-2020.

Course Code	Category(Core: Theory/Practical)	Name of the programme	Introduced in Semester
19122DSC56C	E-Learning	B.C.A	2019
19122DSC65C	Software Project Management	B.C.A	2019
19122PEE	Program Exit Examination	B.C.A	2019
19120DSC56C	Middleware Technology	B.Sc. CS	2019
19120DSC56D	Enterprise Resource Planning	B.Sc. CS	2019
19120DSC65C	Ethical hacking	B.Sc. CS	2019
19120PEE	Program Exit Examination	B.Sc. CS	2019
19222SEC62	Software Project Management	MCA	2019
19222SEC63	Big Data	MCA	2019
19222PEE	Program Exit Examination	MCA	2019
19222DSC47A	Game Programming	MCA	2019
19222DSC47C	Middleware Technology	MCA	2019
19222 DSC 56A	Information Security	MCA	2019
19222 DSC56B	Internet of Things	MCA	2019
19222DSC56C	M-Marketing	MCA	2019
19220DSC16B	Advanced Computer Architecture	M.Sc. CS	2019
19220DSC35B	Real time operating System	M.Sc. CS	2019
19211OEC	Writing for the Media	M.Sc. CS	2019
19212OEC	Applicable Mathematics Techniques	M.Sc. CS	2019
19213OEC	Bio-Medical Instrumentation	M.Sc. CS	2019
19214OEC	Green Chemistry	M.Sc. CS	2019
19215OEC	Bio analytical Techniques	M.Sc. CS	2019
19261OEC	Insurance Services	M.Sc. CS	2019
19280OEC	Counselling Psychology	M.Sc. CS	2019
19220SEC42	Human Computer Interaction	M.Sc. CS	2019
19220DSC43B	Multimedia and its applications	M.Sc. CS	2019
19220DSC43C	Middleware Technology	M.Sc. CS	2019
19220PEE	Programme Exit Examination	M.Sc. CS	2019

The Following Value added new Diploma and Certificate courses were introduced in the academic 2019-2020.

Name of the course/programme	Course/programme Code	Year of offering
Diploma in Mat Lab	19CCML01	2019
Diploma in Graphical Programming	19CCGP02	2019
Diploma in Web Application Development & Hosting	19CCWAH03	2019
Certificate in Designing Photoshop	19CCDP04	2019
Certificate in Android App Development	19CCAAP05	2019
Certificate in web designing and hosting	19CCOWP06	2019
Certificate in data visualization tools	19CCDV01	2019

The Chairman of Board of Studies thanked all the members for their kind cooperation and the meeting came to an end.



PRIN, Division of Arts, University
Thiruvananthapuram - 611 003, Kerala



Dean of Arts & Science
PRIN, Division of Arts, University
Thiruvananthapuram - 611 003, Kerala



SCHOOL OF ARTS AND SCIENCE

DEPARTMENT OF COMPUTER SCIENCE

B.C.A(BACHELOR OF COMPUTER APPLICATION)

(For the candidates admitted from the academic year 2019-2020 onwards)

Research Integrated Curriculum 2019-2020 onwards

COURSE STRUCTURE

SEMESTER - I

Course Code	Course Title	L	T	P	C
19110AEC11/ 19132AEC11/ 19111AEC11/ 19135AEC11	Tamil-I/Hindi-I/Advanced English-I/French-I	4	0	0	2
19111AEC12	English-I	4	0	0	2
19122SEC13	Programming in C with C++	5	1	0	6
19122SEC14L	Programming in C with C++Lab	0	0	3	2
19112AEC15B	Classical algebra	5	0	0	4
19112AEC16B	Numerical and statistical methods	4	0	0	4
191__SEC01	Skill Based Elective -I	0	0	2	1
19111SEC01L	Communicative English Lab-I	0	0	1	1
191INDCONS	India's Constitution	1	0	0	1
	Total	23	1	6	23

SEMESTER – II

Course Code	Course Title	L	T	P	C
19110AEC21/ 19132AEC21/ 19111AEC21/ 19135AEC21	Tamil-II/Hindi-II/Advanced English-II/French-II	4	0	0	2
19111AEC22	English-II	4	0	0	2
19122SEC23	Data Structure and Algorithms	6	0	0	6
19122SEC24L	Data Structure and Algorithms Lab	0	0	3	2
19112AEC25B	Discrete Mathematics	5	0	0	4
19112AEC26B	Operations Research	4	0	0	4
19122RLC27	Research Led Seminar	-	-	-	1
191__SEC02_ -	Skill Based Elective-I	0	0	2	1
19111SEC02L	Communicative English Lab-II	0	0	2	1
	Total	23	0	7	23

SEMESTER – III

Course Code	Course Title	L	T	P	C
19110AEC31/ 19132AEC31/ 19111AEC31/ 19135AEC31	Tamil-III/Hindi-III/Advanced English-III/ French-III	4	0	0	2
19111AEC32	English-III	4	0	0	2
19122SEC33	Internet and Java Programming	4	1	0	6
19122SEC34L	Internet and Java Programming Lab	0	0	3	2
19161SEC35	Financial Accounting	4	0	0	4
19113AEC36C	Allied Physics – I	3	0	0	4
19122RMC37	Research Methodology	3	0	0	3
191_ SEC03_	Skill Based Elective –III	0	0	2	1
19111SEC03L	Communicative English Lab-III	0	0	2	1
	Total	22	1	7	25

SEMESTER – IV

Course Code	Course Title	L	T	P	C
19110AEC41/ 19132AEC41/ 19111AEC41/ 19135AEC41	Tamil-IV/Hindi-IV/Advanced English-IV/French-IV	4	0	0	2
19111AEC42	English-IV	4	0	0	2
19122SEC43	Visual Programming	6	0	0	6
19122SEC44L	Visual Programming Lab	0	0	3	4
19113AEC45C	Allied Physics -II	5	1	0	6
19113AEC46C L	Allied Physics Lab - I	0	0	3	2
191 __SEC04__	Skill Based Elective-IV	0	0	2	1
19111SEC04L	Communicative English Lab-IV	0	0	1	1
191ENVTSTU	Environmental Studies	1	0	0	1
	Total	20	1	9	25

SEMESTER - V

Course Code	Course Title	L	T	P	C
19122SEC51	Relational Database Management Systems	5	1	0	5
19122SEC52	.NET Programming	4	1	0	5
19122SEC53	Designing and supporting Computer Networks	4	0	0	5
19122SEC54L	Oracle Lab	0	0	3	2
19122SEC55L	.NET Programming Lab	0	0	3	2
19122DSC56_	Discipline Specific Elective -I	5	0	0	4
19122BRC57	Participation in Bounded Research	0	0	0	2
191__SEC05_	Skill Based Elective-V	0	0	2	1
19111SEC05L	Communicative English Lab-V	0	0	2	1
Total		18	2	10	27

SEMESTER - VI

Course Code	Course Title	L	T	P	C
19122SEC61	Advanced Web Technology	4	1	0	5
19122SEC62	Operating System	4	1	0	5
19122SEC63L	Advanced Web Technology Lab	0	0	3	2
19122SEC64L	Operating System Lab	0	0	3	2
19122DSC65_	Discipline Specific Elective -II	5	0	0	4
191__GEC	General Elective	4	0	0	2
19122PRW67	Project Work	0	0	0	4
191__SEC06_	Skill Based Elective -VI	0	0	2	1
19111SEC06L	Communicative English Lab-VI	0	0	2	1
19122EXACT	Extension Activities	0	0	0	1
19122PEE	Program Exit Examination	0	0	0	0
Total		17	2	10	27
Total Credits of the Programme					150

DISCIPLINE SPECIFIC ELECTIVE COURSES:

Semester	Elective	Course Code	Course Title
V	I	19122DSC56A	Computer Organization and Architecture
		19122DSC56B	Data Mining
		19122DSC56C	E-Learning
VI	II	19122DSC65A	Software Engineering
		19122DSC65B	Object Oriented Analysis and Design
		19122DSC65C	Software Project Management

CREDIT DISTRIBUTION

SEMESTER	AEC	SEC	DSC	GEC	RESEARCH	OTHERS EVS&IC	EXTACT	TOTAL
I	12	10				1		23
II	12	10			1			23
III	8	14			3			25
IV	12	12				1		25
V		21	4		2			27
VI		16	4	2	4		1	27
TOTAL	48	79	8	2	10	2	1	150



SCHOOL OF ARTS AND SCIENCE
(MASTER OF COMPUTER APPLICATION)
REGULATION 2019-2020

COURSE STRUCTURE

Semester I

Course Code	Course Title	L	T	P	C
19222SEC11	C Programming and Data structure	4	0	0	3
19222SEC12	Data communication network	5	0	0	4
19222SEC13	Computer Architecture	5	0	0	3
19222SEC14	Programming in VB	5	0	0	4
19212AEC15	Numerical and Statistical Methods	5	0	0	4
19222SEC16L	C programming and Data structure Lab	0	0	3	2
19222SEC17L	Programming in VB Lab	0	0	3	2
	Total	24	0	6	22

Semester II

Course Code	Course Title	L	T	P	C
19222SEC21	OOPs with C++	3	0	0	4
19222SEC22	Operating system	5	0	0	4
19222SEC23	Web Designing	5	0	0	4
19222SEC24	Database Management system	5	0	0	4
19212AEC25	Optimization Technique.	4	0	0	3
19222SEC26L	OOPs with C++ Lab	0	0	3	2
19222SEC27L	Web Designing Lab	0	0	3	2
	Total	24	0	6	23

Semester III

Course Code	Course Title	L	T	P	C
19222SEC31	J2EE Programming	4	0	0	4
19222SEC32	Relational Data Base Management System.	4	0	0	4
19222SEC33	Routing and Switching in LAN	4	0	0	4
19212SEC34	Discrete Mathematics	4	0	0	4
19222SEC35L	J2EE Programming Lab	0	0	3	2
19222SEC36L	RDBMS Lab	0	0	3	2
19222DSC37_	Discipline Specific Elective – I	4	0	0	4
19222RLC38	Research Led Seminar	-	-	-	1
	Total	22	0	8	25

Semester IV

Course Code	Course Title	L	T	P	C
19222SEC41	Python Programming	4	0	0	4
19222SEC42	Cryptogrphy Network security	4	1	0	4
19222SEC43	Open Source programming	4	0	0	3
19222SEC44	Web Service	4	0	0	3
19222SEC45L	Python Programming Lab	0	0	3	2
19222SEC46L	Open Source programming Lab	0	0	3	2
19222DSC47_	Discipline Specific Elective – II	5	0	0	4
19222RMC48	Research Methodology	3	0	0	3
19222BRC49	Participation in Bounded Research	0	0	0	2
	Total	24	1	6	27

Semester V

Course Code	Course Title	L	T	P	C
19222SEC51	Data mining and warehousing	6	1	0	6
19222SEC52	Grid and Cloud Computing.	6	1	0	5
19222SEC53	.NET Programming	5	0	0	4
19222SEC54	Object Oriented System Design	5	0	0	4
19222SEC55L	.NET Programming Lab.	0	0	3	2
19222DSC56	Discipline Specific Elective – III	5	0	0	4
19222SRC57	Societal project (Mini Project)	0	0	0	2
	Total	25	2	3	27

Semester VI

Course Code	Course Title	L	T	P	C
19222SEC61	Human Computer Interaction.	6	0	0	6
19222SEC62	Software Project Management	6	0	0	5
19222SEC63	Big Data	6	0	0	5
19222PRW64	Project work	0	0	15	10
19222PEE	Program Exit Examination	-	-	-	2
	Total	5	0	26	28
	Total Credits of the Programme				152

DISCIPLINE SPECIFIC ELECTIVE COURSES

Semester	Discipline Specific Elective Courses
III	19222DSC37A - Mobile Computing 19222DSC37B - Knowledge based decision support system
IV	19222DSC47A - Game Programming 19222DSC47B - Multimedia and Graphics 19222DSC47C - Middleware Technology
V	19222 DSC56A-Information Security 19222 DSC56B-Internet of Things 19222DSC56C -M-Marketing

CREDIT DISTRIBUTION

SEMESTER	AEC	SEC	DSC	GEC	RESEARCH	OTHERS	TOTAL
I	4	18					22
II	3	20					23
III		20	4		1		25
IV		18	4		5		27
V		21	4		2		27
VI		17			10	2	29
TOTAL	7	114	12		18	2	152



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SCHOOL OF ARTS AND SCIENCE

B.Sc. CS

(For the candidates admitted from the academic year 2019-2020 onwards)

Research Integrated Curriculum 2019-2020 onwards

COURSE STRUCTURE

SEMESTER-I

Course Code	Course Title	L	T	P	C
19110AEC11/ 19132AEC11/ 19111AEC11/ 19135AEC11	Tami - I/Hindi-I/Advanced English-I/French - I	4	0	0	2
19111AEC12	English-I	4	0	0	2
19120SEC13	Programming in C with C++	5	1	0	6
19120SEC14L	Programming in C with C++ Lab	0	0	3	2
19112AEC15B	Classical algebra	5	0	0	4
19112AEC16B	Numerical and statistical Methods	4	0	0	4
191_SEC01	Skill Based Elective -I	0	0	2	1
19111SEC01L	Communicative English Lab-I	0	0	1	1
191INDCONS	Indian Constitution	1	0	0	1
	Total	23	1	6	23

SEMESTER II

Course Code	Course Title	L	T	P	C
19110AEC21/ 19132AEC21/ 19111AEC21/ 19135AEC21	Tamil - II/Hindi-II/Advanced English- II/French - II	4	0	0	2
19111AEC22	English-II	4	0	0	2
19120SEC23	Internet and Java Programming	5	1	0	6
19120SEC24L	Internet and Java Programming Lab	0	0	3	2
19112AEC25B	Discrete Mathematics	5	0	0	4
19112AEC26B	Operations Research	4	0	0	4
19120R1C27	Research Led Seminar	-	-	-	1
191 SEC02	Skill based Elective -II	0	0	2	1
19111SEC02L	Communicative English Lab-II	0	0	2	1
	Total	22	1	7	23

SEMESTER III

Course Code	Course Title	L	T	P	C
19110AEC31/ 19132AEC31/ 19111AEC31/ 19135AEC31	Tamil – III/Hindi-III/Advanced English-III/ French – III	4	0	0	2
19111AEC32	English-III	4	0	0	2
19120SEC33	Visual Programming	5	0	0	6
19120SEC34L	Visual Programming Lab	0	0	3	2
19113AEC35A	Applied physics –I	4	0	0	6
19113AEC36AL	Applied physics Lab – I	0	0	3	2
19120RMC37	Research Methodology	3	0	0	3
191_SEC03__	Skill based Elective –III	0	0	2	1
19111SEC03L	Communicative English Lab-III	0	0	2	1
	Total	20	0	10	25

SEMSEETR IV

Course Code	Course Title	L	T	P	C
19110AEC41/ 19132AEC41/ 19111AEC41/ 19135AEC41	Tamil-IV/Hindi-IV/Advanced English-IV/French - IV	4	0	0	2
19111AEC42	English-IV	4	0	0	2
19120SEC43	Active Server Programming	3	1	0	6
19120SEC44L	Active Server Programming Lab	0	0	3	4
19113AEC45A	Applied physics -II	6	0	0	6
19113AEC46AL	Applied physics Lab -II	0	0	3	2
191__SEC04__	Skill based Elective -IV	0	0	2	1
19111SEC04L	Communicative English Lab-IV	0	0	1	1
191ENVTSTU	Environmental Studies	1	0	0	1
	Total	20	1	9	25

SEMESTER – V

Course Code	Course Title	L	T	P	C
19120SEC51	Data Communication and Networking	5	0	0	5
19120SEC52	Operating System	4	1	0	5
19120SEC53	Microprocessor and its Applications	4	1	0	5
19120SEC54L	Microprocessor Lab	0	0	3	2
19120SEC55L	Operating System Lab	0	0	3	2
19120DSC56	Discipline Specific Elective -I	5	0	0	4
19120BRC57	Participation in Bounded Research	-	-	-	2
191__SEC05	Skill Based Elective -V	0	0	2	1
19111SEC05L	Communicative English Lab-V	0	0	2	1
	Total	18	2	10	27

SEMESTER – VI

Course Code	Course Title	L	T	P	C
19120SEC61	.NET Programming	4	1	0	5
19120SEC62	Relational Data Base Management System	4	1	0	5
19120SEC63L	.NET Programming Lab	0	0	3	2
19120SEC64L	Oracle Lab	0	0	3	2
19120DSC65_	Discipline Specific Elective –II	5	0	0	4
19120DSC66C	Ethical Hacking				
191__GEC	General Elective	4	0	0	2
19120PRW67	Project Work	-	-	-	4
191__SEC06_	Skill Based Elective –VI	0	0	2	1
19111SEC06L	Communicative English – VI	0	0	2	1
19120EXACT	Extension Activities	0	0	0	1
19120PEE	Program Exit Examination	0	0	0	1
	Total	17	2	10	27
Total Credits of the Programme					150

DISCIPLINE SPECIFIC ELECTIVE COURSES:

Semester	Elective	Course Code	Course Title
V	I	19120DSC56A	Cloud Computing
		19120DSC56B	Software Engineering
		19120DSC56C	Middleware Technology
		19120DSC56D	Enterprise Resource Plan
VI	II	19120DSC65A	Data Mining
		19120DSC65B	Artificial Intelligence and Expert System
		19120DSC65C	Ethical hacking

CREDIT DISTRIBUTION

SEMESTER	AE C	SE C	DS C	GE C	RESEARCH	OTHER S EVS&I C	EXTAC T	TOTAL
I	12	10				1		23
II	12	10			1			23
III	12	10			3			25
IV	12	12				1		25
V		21	4		2			27
VI		16	4	2	4		1	27
TOTAL	48	79	8	2	10	2	1	150



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SCHOOL OF ARTS AND SCIENCE
(MASTER OF COMPUTER SCIENCE)
REGULATION 2019-2020

COURSE STRUCTURE
Semester I

Course Code	Course Title	L	T	P	C
19220SEC11	J2EE Programming	6	0	0	4
19220SEC12	RDBMS	6	0	0	3
19220AEC13	Discrete Mathematics	6	0	0	4
19220SEC14L	J2EE programming Lab	0	0	3	2
19220SEC15L	RDBMS Lab	0	0	3	2
19220DSC16	Discipline Specific Elective - I	6	0	0	4
19220RLC17	Research Led Seminar	-	-	-	1
	Total	24	0	6	20

Semester II

Course Code	Course Title	L	T	P	C
19220SEC21	Python Programming	5	0	0	4
19220SEC22	Cryptography & Network Security	5	0	0	3
19220SEC23	Software Engineering	5	0	0	3
19220SEC24L	Python Programming Lab	0	0	3	2
19220SEC25L	UNIX Lab	0	0	3	2
19220DSC26_	Discipline Specific Elective – II	5	0	0	4
19220RMC27	Research Methodology	4	0	0	3
19220BRC28	Participation in Bounded Research	-	-	-	2
	Total	24	0	6	23

Semester III

Course Code	Course Title	L	T	P	C
19220SEC31	Open Source programming	6	0	0	6
19220SEC32	.Net Programming	6	0	0	4
19220SEC33L	.Net Programming Lab	0	0	3	2
19220SEC34L	Open Source programming Lab	0	0	3	2
19220DSC35_	Discipline Specific Elective – III	5	0	0	4
192__OEC	Open Elective Course	4	0	0	4
19220SRC37	Societal project (Mini Project)	0	0	0	2
	Total	21	0	6	24

Semester IV

Course Code	Course Title	L	T	P	C
19220SEC41	Software Testing	6	0	0	6
19220SEC42	Human Computer Interaction	6	0	0	6
19220DSC43_	Discipline Specific Elective - IV	4	0	0	4
19220PRW42	Project work	0	0	0	7
19220PEE	Programme Exit Examination	-	-	-	2
	Total	4	0	0	25
	Total credit for the program				92

DISCIPLINE SPECIFIC ELECTIVE COURSES:

Semester	Discipline Specific Elective Courses - I
I	1920DSC16A - WAP and XML 19220DSC16B - Advanced Computer Architecture
III	19220DSC35A - Wireless Communication Network 19220DSC35B - Real time Operating Systems
IV	19220DSC43A - Compiler Design 19220DSC43B - Multimedia and its applications 19220DSC43C - Middleware Technologies

Open Elective Course

Semester	Open Elective Courses
III	a) 19211OEC - Writing for the Media b) 19212OEC - Applicable Mathematics Techniques c) 19213OEC - Bio-Medical Instrumentation d) 19214OEC - Green Chemistry e) 19215OEC - Bio analytical Techniques f) 19261OEC - Insurance Services g) 19280OEC - Counselling Psychology

CREDIT DISTRIBUTION

SEMESTER	AEC	SEC	DSC	OEC	RESEARCH	OTHERS	TOTAL
I	4	15			1		20
II		14	4		5		23
III		16	4	2	2		24
IV		12	4		7	2	25
TOTAL	4	59	12	2	15	2	92



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DEPARTMENT OF COMPUTER SCIENCE
NEW COURSES – 2019-2020
BCA

Course Code	Course Title	L	T	P	C
19122DSC56C	E-Learning	4	1	0	3

UNIT I INTRODUCTION

Introduction – Training and Learning, Understanding eLearning, components and models of e- learning, Advocacy of e-learning – benefits, learning styles, criteria for choosing. Applications of E-learning.

UNIT II CONCEPTS and DESIGN

E-Learning Strategy, the essential elements of eLearning strategy, Quality assuring eLearning, suppliers and resources, virtual learning environments, authoring tools, assessment, Learning Design Issues – purpose, general principles, designing live eLearning, designing self-managed learning.

UNIT III APPLICATIONS

Moodle 2.0 E-Learning Course Development – Features, Architecture, Installation and Configuring Site.

UNIT IV COURSE MANAGEMENT

Creating – Categories, Courses, Adding Static Course Material – Links, Pages, Moodle HTML Editor, Media Files, interacting with Lessons and Assignments – Evaluating Students – Quizzes and Feedback.

UNIT V ENHANCEMENT

Adding Social Activities - Chat, Forum, Ratings, and Blocks – Types, Activities, Courses, HTML, and Online Users – Features for Teachers.

REFERENCE BOOKS:

1. Delivering E-Learning: A complete Strategy for Design, Application and Assessment.

Kenneth Fee, Kegan page, 2009.

Course Code	Course Title	L	T	P	C
19122DSC65C	Software Project management	4	1	0	3

UNIT I INTRODUCTION TO PROJECT MANAGEMENT

Project Definition – Contract Management – Activities Covered by Software Project Management – Overview of Project Planning – Stepwise Project Planning.

UNIT II PROJECT EVALUATION

Strategic Assessment – Technical Assessment – Cost Benefit Analysis – Cash Flow Forecasting – Cost Benefit Evaluation Techniques – Risk Evaluation.

UNIT III ACTIVITY PLANNING

Objectives – Project Schedule – Sequencing and Scheduling Activities – Network Planning Models – Forward Pass – Backward Pass – Activity Float – Shortening Project Duration Activity on Arrow Networks – Risk Management – Nature of Risk Types of Risk Managing Risk Hazard Identification – Hazard Analysis – Risk Planning and Control.

UNIT IV MONITORING AND CONTROL

Creating Framework – Collecting the Data – Visualizing Progress – Cost Monitoring Earned Value – Prioritizing Monitoring – Getting Project Back To Target – Change Control – Managing Contracts – Introduction – Types of Contract – Stages in Contract Placement – Typical Terms of a Contract – Contract Management – Acceptance.

UNIT V MANAGING PEOPLE AND ORGANIZING TEAMS

Introduction – Understanding Behavior – Organizational Behavior: A Background Selecting the Right Person for the Job – Instruction in the Best Methods – Motivation The Old man–Hackman Job Characteristics Model – Working in Groups – Becoming A-team – Decision Making – Leadership – Organizational Structures – Stress – Health and Safety – Case Studies.

REFERENCES:

1. Bob Hughes and Mike Cotterell "Software Project Management", Third Edition, TATA McGraw Hill Edition 2004.
2. Ramesh, Gopaldaswamy: "Managing Global Projects ", Tata McGraw Hill, 2001.



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DEPARTMENT OF COMPUTER SCIENCE
NEW COURSES - 2019
BSC CS

Course Code	Course Title	L	T	P	C
19120DSC56C	Middleware Technology	4	1	0	3

UNIT I

CLIENT / SERVER CONCEPTS Client-Server - File server - Database server - Group server - Object server - Webserver - Middleware - General Middleware - Service specific middleware - Client /server building blocks - RPC.

UNIT II

EJB ARCHITECTURE EJB - EJB architecture - Overview of EJB software architecture - View of EJB -Conversation - Building and Deploying EJBs - Roles in EJB.

UNIT III

EJB APPLICATIONS EJB session beans - EJB entity beans - EJB clients - EJB deployment - Building an application with EJB

UNIT IV

CORBA: CORBA - Distributed systems - Purpose - Exploring CORBA alternatives - Architecture overview - CORBA and networking Model - CORBA object model -IDL - ORB - Building an application with CORBA.

UNIT V

COM: COM - Data types - Interfaces - Proxy and stub - Marshalling - Implementing Server/Client - Interface pointers - Object creation - Invocation - Destruction -Comparison COM and CORBA.

TEXT BOOKS

1. Robert Orfali, Dan Harkey and Jeri Edwards, "The Essential Client/Server Survival Guide", Gaigotia Publications Pvt. Ltd., 2002.

Course Code	Course Title	L	T	P	C
19120DSC56D	Enterprise Resource Planning	4	1	0	3

COURSE OBJECTIVE

Become familiarize with ERP process.

Learn ERP implementation process using information technology.

COURSE OUTCOMES

Design and Develop ERP applications by using features of ERP tools.

UNIT I BASICS OF ERP

ERP essentials – ERP evolution – ERP market – ERP tiers – information systems Presentation tier – application tier – database tier.

UNIT II ENTERPRISE SYSTEMS

Enterprise systems – standalone mainframe systems – client server architecture – service oriented architecture – types of enterprise systems – types of data – SAP overview.

UNIT III PROCESS IN ERP

Basic Procurement process – physical flow – document flow – information flow – financial impact- role of enterprise systems in the procurement process – fulfilment process production process.

UNIT IV INTEGRATION

Integrated processes – Integrated processes execution – additional intercompany processes – extended (intercompany) processes.

UNIT V CASE STUDY

ERP for construction industry – ERP for a corrugated box manufacturing company – ERP for lens making company – ERP for furniture manufacturing company – ERP for toys manufacturing company - M.C. Donald's story – Automobile enterprises.

REFERENCE BOOKS:

1. Sinha R Magill, Jeff Word, "Essentials of Business Processes and Information Systems", Wiley Publications, 2009.
2. Marianne Bradford, "Modern ERP: Select, Implement and use today's advanced Business systems", Lulu Publishers, Second Edition, 2010.

Course Code	Course Title	L	T	P	C
19120DSC65C	Ethical Hacking	4	1	0	3

UNIT I ETHICAL HACKING OVERVIEW

Understanding the importance of security, Concept of ethical hacking and essential Terminologies Threat, Attack.

UNIT II FOOTPRINTING & PORT SCANNING

Foot printing - Introduction to foot printing, Understanding the information gathering methodology of the hackers, Tools used for the reconnaissance phase. Port Scanning - Introduction, using port scanning tools, ping sweeps, Scripting Enumeration-Introduction, Enumerating windows OS & Linux OS.

UNIT III SYSTEM HACKING

Aspect of remote password guessing, Role of eaves dropping, Various methods of password cracking, Keystroke Loggers, Understanding Sniffers, Comprehending Active and Passive Sniffing, ARP Spoofing and Redirection, DNS and IP Sniffing, HTTPS Sniffing.

UNIT IV HACKING WEB SERVICES & SESSION HIJACKING

Web application vulnerabilities, application coding errors, SQL injection into Back-end Databases, cross-site scripting, cross-site request forging, authentication bypass, web services and related flaws, protective http headers Understanding Session Hijacking, Phases involved in Session Hijacking, Types of Session Hijacking, Session Hijacking Tools.

UNIT V HACKING WIRELESS NETWORKS

Introduction to 802.11, Role of WEP, Cracking WEP Keys, Sniffing Traffic, WirelessDOSattacks, WLANScanners, WLANSniffers,HackingTools, SecuringWireless Networks.

REFERENCES

1. Kimberly Graves, "Certified Ethical Hacker", Wiley India Pvt Ltd, 2010
2. Michael T. Simpson, "Hands-on Ethical Hacking & Network Defense", Course Technology, 2010



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DEPARTMENT OF COMPUTER SCIENCE
NEW COURSES – 2019
MCA

Course Code	Course Title	L	T	P	C
19222SEC62	Software Project Management	4	1	0	3

UNIT I INTRODUCTION TO PROJECT MANAGEMENT

Project Definition – Contract Management – Activities Covered by Software Project Management – Overview of Project Planning – Stepwise Project Planning.

UNIT II PROJECT EVALUATION

Strategic Assessment – Technical Assessment – Cost Benefit Analysis – Cash Flow Forecasting – Cost Benefit Evaluation Techniques – Risk Evaluation.

UNIT III ACTIVITY PLANNING

Objectives – Project Schedule – Sequencing and Scheduling Activities – Network Planning Models – Forward Pass – Backward Pass – Activity Float – Shortening Project Duration – Activity on Arrow Networks – Risk Management – Nature of Risk – Types Of Risk -Managing Risk – Hazard Identification – Hazard Analysis – Risk Planning And Control.

UNIT IV MONITORING AND CONTROL

Creating Framework – Collecting the Data – Visualizing Progress – Cost Monitoring Earned Value – Prioritizing Monitoring – Getting Project Back To Target – Change Control – Managing Contracts – Introduction – Types of Contract – Stages in Contract Placement – Typical Terms of a Contract – Contract Management – Acceptance.

UNIT V MANAGING PEOPLE AND ORGANIZING TEAMS

Introduction – Understanding Behavior – Organizational Behavior: A Background Selecting the Right Person for the Job – Instruction in the Best Methods Motivation the Old man Hackman Job Characteristics Model – Working in Groups Becoming A-team Decision Making Leadership – Organizational Structures – Stress – Health And Safety – Case Studies.

REFERENCES:

1. Bob Hughes and MikeCotterell "Software Project Management", Third Edition, TATA McGraw Hill Edition 2004

Course Code	Course Title	L	T	P	C
19222SEC63	Big Data	6	0	0	5

OBJECTIVES:

- ❖ To explore the fundamental concepts of big data analytics
- ❖ To learn to analyze the big data using intelligent techniques.
- ❖ To understand the various search methods and visualization techniques.

UNIT I INTRODUCTION TO BIG DATA

Introduction to Big Data Platform – Challenges of Conventional Systems - Intelligent data analysis – Nature of Data - Analytic Processes and Tools - Analysis vs. Reporting - Modern Data Analytic Tools - Statistical Concepts: Sampling Distributions - Re-Sampling - Statistical Inference - Prediction Error.

UNIT II MINING DATA STREAMS

Introduction To Streams Concepts – Stream Data Model and Architecture - Stream Computing - Sampling Data in a Stream – Filtering Streams – Counting Distinct Elements in a Stream – Estimating Moments – Counting Oneness in a Window – Decaying Window - Real time Analytics Platform(RTAP) Applications - Case Studies - Real Time Sentiment Analysis, Stock Market Predictions.

UNIT III HADOOP

History of HADOOP- The HADOOP Distributed File System – Components of Hadoop- Analyzing the Data with HADOOP- Scaling Out- hadoop Streaming- Design of HDFS-Java interfaces to HDFS Basics-Developing a Map Reduce Application-How Map Reduce Works- Anatomy of a Map Reduce Job run-Failures-Job Scheduling-Shuffle and Sort – Task execution - Map Reduce Types and Formats- Map Reduce Features

UNIT IV HADOOP ENVIRONMENT

Setting up a HADOOP Cluster - Cluster specification - Cluster Setup and Installation - HADOOP

Configuration-Security in HADOOP - Administering HADOOP- HDFS - Monitoring-Maintenance- HADOOP benchmarks- HADOOP in the cloud

UNIT V FRAMEWORKS

Applications on Big Data Using Pig and Hive – Data processing operators in Pig – Hive services – Havel – Querying Data in Hive - fundamentals of Base and Zookeeper - IBM Info Sphere Big Insights and Streams. Visualizations - Visual data analysis techniques, interaction techniques: Systems and application

OUTCOMES:

- The students will be able to:
- Work with big data platform
- Analyze the big data analytic techniques for useful business applications.

REFERENCES

1. Michael Berthold, David J. Hand, "Intelligent Data Analysis", Springer, 2007.
2. Tom White "HADOOP: The Definitive Guide" Third Edition, O'reilly Media, 2012.
3. Chris Eaton, Dirk Deron, Tom Deutsch, George Lapis, Paul Zikopoulos, "Understanding Big Data: Analytics for Enterprise Class HADOOPA and Streaming Data", McGraw-Hill Publishing, 2012

Course Code	Course Title	L	T	P	C
19222DSC47A	GAME PROGRAMMING	5	0	0	4

OBJECTIVES:

- To get subsequent understanding of game design and development, which includes the processes, mechanics, and issues in game design, game engine development, modeling, techniques, handling situations, and logic.
- To create interactive games

UNIT I BASICS FOR GAME PROGRAMMING

Coordinate Systems, Ray Tracing, Modeling in Game Production, Vertex Processing, Pasteurization, Fragment Processing and Output Merging, Illumination and Shades, Parametric Curves and Surfaces, Shade Models, Image Texturing, Bump Mapping, Advanced Texturing, Character Animation, Physics-based Simulation.

UNIT II GAME DESIGN PRINCIPLES & THEORY

Game Logic, Game AI, Path Finding, Game Theory, Character development, Story Telling, Narration, Game Balancing, Core mechanics, Principles of level design, Genres of Games, Collision Detection.

UNIT III GAMING ENGINE REQUIREMENT & DESIGN

Renderers, Software Rendering, Hardware Rendering, and Controller based animation, Spatial Sorting, Level of detail, collision detection, standard objects, and physics.

UNIT IV GAMING PLATFORMS AND FRAMEWORKS

Flash, DirectX, OpenGL, Java, Python, XNA with Visual Studio, Mobile Gaming for the Android, is, Game engines - Adventure Game Studio, DX Studio, and Unity.

UNIT V GAME DEVELOPMENT ENVIRONMENT

Developing 2D and 3D interactive games using OpenGL, DirectX – Isometric and Tile Based Games, Puzzle games, Single Player games, and Multi-Player games.

OUTCOMES:

- Illustrate an understanding of the concepts behind game programming techniques.
- Implement game programming techniques to solve game development tasks.
- Construct a basic game engine using open-source programming libraries.

REFERENCES:

1. Andy Harris, "Beginning Flash Game Programming For Dummies", For Dummies; Updated Edition, 2005.
2. David H. Eberly, "3D Game Engine Design, Second Edition: A Practical Approach to Real-Time Computer Graphics" Morgan Kaufmann, 2nd Edition, 2006
3. Dino Dini, "Essential 3D Game Programming", Morgan Kaufmann, 1st Edition, 2012
4. Ernest Adams and Andrew Rollings, "Fundamentals of Game Design", Prentice Hall 1st Edition, 2006

Course Code	Course Title	L	T	P	C
19222DSC47C	MIDDLEWARE TECHNOLOGY	5	0	0	4

OBJECTIVES:

The main objective of the course is to create a practical, wide-ranging discussion on Middleware Technologies to help students understand what is going on so they can pick out the real issues from

- Understand Distributed systems design and implementation
- Understand existing Distributed Technologies
- Use Middleware to Build Distributed Applications
- Understand Middleware Interoperability
- Understand Web services architectures Course

UNIT I INTRODUCTION

Emergence of Middleware – Objects, Web Services – Middleware Elements – Vendor Architecture – Interoperability – Middleware in Distributed Applications – Types of Middleware Transaction-Oriented Middleware – MOM – RPC.

UNIT II OBJECT ORIENTED MIDDLEWARE

OOM – Developing with OOM – Heterogeneity – Dynamic Object Request – Java RMI – COM+.

UNIT III COMPONENT OBJECT RESOURCE BROKER ARCHITECTURE (CORBA)

Naming – Trading – Life Cycle – Persistence – Security – CORBA.

UNIT IV WEB SERVICES

Introduction – XML Web Services standards – Creating Web Services – Extending Web Services – Messaging Protocol – Describing – Discovering – Securing.

UNIT V OTHER TYPES OF MIDDLEWARE

Real-time Middleware – RT CORBA – Multimedia Middleware – Reflective Middleware – Agent-Based Middleware – RFID Middleware.

Outcomes:

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

- Learn how to use Middleware to Build Distributed Applications
- Implement Business Processes
- Learn about Middleware Technologies
- Implement Business Processes
- Learn application design and IT architecture

REFERENCES BOOKS

1. Chris Britton and Peter Eye, "IT Architecture and Middleware", Pearson Education, 2nd Edition, 2004.
2. Wolfgang Emeriti, "Engineering Distributed Objects", John Wiley, 2000.
3. Keith Ballinger, ".NET Web Services – Architecture and Implementation", Pearson Education, 2003. (Unit IV).
4. Quay H. Mahmoud, "Middleware for Communications", John Wiley and Sons, 2004.

Course Code	Course Title	L	T	P	C
19222DSC56A	Information Security	5	0	0	4

OBJECTIVES

- To understand the basics of Information Security
- To know the legal, ethical and professional issues in Information Security
- To know the aspects of risk management
- To become aware of various standards in this area
- To know the technological aspects of Information Security

UNIT I INTRODUCTION

History, what is Information Security, Critical Characteristics of Information, NSTISSC Security Model, Components of an Information System, Securing the Components, Balancing Security and Access, The SDLC, The Security SDLC

UNIT II SECURITY INVESTIGATION

Need for Security, Business Needs, Threats, Attacks, Legal, Ethical and Professional Issues

UNIT III SECURITY ANALYSIS

Risk Management: Identifying and Assessing Risk, Assessing and Controlling Risk

UNIT IV LOGICAL DESIGN

Blueprint for Security, Information Security Policy, Standards and Practices, ISO 17799 / BS 7799, NIST Models, VISA International Security Model, Design of Security Architecture, Planning for Continuity

UNIT V PHYSICAL DESIGN

Security Technology, IDS, Scanning and Analysis Tools, Cryptography, Access Control Devices, Physical Security, Security and Personnel

REFERENCES

1. Michael E Whitman and Herbert J Mattord, "Principles of Information Security", Vikas Publishing House, New Delhi, 2003
2. Micki Krause, Harold F. Tipton, "Handbook of Information Security Management", Vol 1-3 CRC Press LLC, 2004.

Course Code	Course Title	L	T	P	C
19222DSC56B	Internet Of Things	5	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

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

M2M high-level ETSI 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

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

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.

UNIT V CASE STUDIES AND REAL-WORLD APPLICATIONS

Real world design constraints - Applications - Asset management, Industrial automation, smart grid, Commercial building automation, Smart cities - participatory sensing - Data Analytics for IoT – Software & Management Tools for IoT Cloud Storage Models & Communication APIs - Cloud for IoT - Amazon Web Services for IoT.

OUTCOMES:

- Upon completion of the course, the student should be able to:
- Analyze various protocols for IoT
- Develop web services to access/control IoT devices.
- Design a portable IoT using Raspberry Pi
- Deploy an IoT application and connect to the cloud.

REFERENCES:

1. Arshdeep Bahga, Vijay Madisetti, "Internet of Things – A hands-on approach", Universities Press, 2015
2. Dieter Uekelman, Mark Harrison, Michahelles, Florian (Eds), "Architecting the Internet of Things". Springer, 2011.
3. Jan Höller, 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.
4. Honbo Zhou, "The Internet of Things in the Cloud: A Middleware Perspective", CRC Press, 2012.
5. Olivier Hersent, David Boswarthick, Omar Elemi, "The Internet of Things – Key Applications and Protocols", Wiley, 2012

Course Code	Course Title	L	T	P	C
19222DSC56C	M-Marketing	5	0	0	4

UNIT I Introduction

Mobile Marketing Campaign, Fortune 500 and Mobile Marketing, consumers engagement with mobile, Terminologies.

UNIT II Businesses Vs. mobile marketing

Classic mistakes in mobile marketing, laying foundation for successful mobile marketing campaign, understanding technology behind mobile marketing – Android, iOS, Windows Phone.

UNIT III

Strategic thinking about Mobile marketing campaign, Mobile Marketing Tools – setting up mobile website for different firms, using SMS, MMS and apps to drive customers to business and other ways to attract customers.

UNIT IV Location Based Marketing

LBS, NFC, Bluetooth and LBA, 2D codes, Tablet, Other Mobile Applications, Business Firms connecting to customers using Mobile – case study, Mobile Marketing for B2B companies, Mobile E-commerce to Drive Revenue.

UNIT V Mobile Payments

Present and Future Mobile Technology, Mobile Application Development.

OUTCOMES

- Upon Completion of the course, the students should be able to:
- Analyze various mobile marketing strategies.
- Market Mobile based Applications.
- Apply various tools in mobile marketing.

REFERENCE BOOKS:

1. Go Mobile: Location Based Marketing, Apps, Mobile Optimized Ad Campaigns, 2D Codes and other Mobile Strategies to Grow your Business, Jeanne Hopkins, Jamie Turner, John Wiley Sons Inc., 2012.



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DEPARTMENT OF COMPUTER SCIENCE
NEW COURSES – 2019
M.Sc. CS

Course Code	Course Title	L	T	P	C
19220DSC16B	Advanced Computer Architecture	6	0	0	4

OBJECTIVES:

The student should be made to:

Understand the micro-architectural design of processors

Learn about the various techniques used to obtain performance improvement and power savings in current processors

UNIT I FUNDAMENTALS OF COMPUTER DESIGN

Review of Fundamentals of CPU, Memory and IO – Trends in technology, power, energy and cost, Dependability - Performance Evaluation

UNIT II INSTRUCTION LEVEL PARALLELISM

ILP concepts – Pipelining overview - Compiler Techniques for Exposing ILP – Dynamic Branch Prediction – Dynamic Scheduling – Multiple instruction Issue – Hardware Based Speculation – Static scheduling - Multi-threading - Limitations of ILP – Case Studies.

UNIT III DATA-LEVEL PARALLELISM

Vector architecture – SIMD extensions – Graphics Processing units – Loop level parallelism.

UNIT IV THREAD LEVEL PARALLELISM

Symmetric and Distributed Shared Memory Architectures – Performance Issues – Synchronization – Models of Memory Consistency – Case studies: Intel i7 Processor, SMT & CMP Processors.

UNIT V MEMORY AND IO

Cache Performance – Reducing Cache Miss Penalty and Miss Rate – Reducing Hit Time – Main Memory and Performance – Memory Technology. Types of Storage Devices – Buses – RAID – Reliability, Availability and Dependability – I/O Performance Measures.

OUTCOMES:

At the end of the course, the student should be able to:

- Evaluate performance of different architectures with respect to various parameters
- Analyze performance of different ILP techniques
- Identify cache and memory related issues in multi-processors

TEXT BOOK:

1. John L. Hennessey and David A Patterson, "Computer Architecture A Quantitative Approach",

Morgan Kaufmann/ Elsevier, Fifth Edition, 2012.

REFERENCES:

1. Kai Hwang and Faye Briggs, "Computer Architecture and Parallel Processing", Mc Graw-Hill International Edition, 2000.
2. Sima D, Fountain T and Kaesuk P, "Advanced Computer Architectures: A Design Space Approach", Addison Wesley, 2000.

Course Code	Course Title	L	T	P	C
19220DSC35B	Real time Operating Systems	5	0	0	4

Unit I

Operating system objectives and functions, Virtual Computers, Interaction of hardware architecture, Evolution of operating systems. Architecture of OS (Monolithic, Microkernel, Layered, Exon-kernel and Hybrid kernel structures). Batch, Multi programming, Multitasking, Multiuser, distributed & real-time O.S.

Unit II

Uniprocessor Scheduling: Types of scheduling: Scheduling algorithms: FCFS, SJF, Priority, Round Robin NIX. Multi-level feedback queue scheduling, Thread scheduling, Multiprocessor Scheduling concept concurrency: Principles of Concurrency, Mutual Exclusion, H/W Support, software approaches, Semaphores and Mute, Message Passing techniques.

Unit III

Deadlock: Principles of deadlock, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection, An Integrated Deadlock Strategies. Memory Management requirements, Memory partitioning: Fixed, dynamic, and partitioning.

Unit IV

Memory allocation Strategies (First Fit, Best Fit, Worst Fit, Next Fit), Fragmentation, Swapping, Segmentation, Paging, Virtual Memory, Demand paging.

Unit V

Page Replacement Policies (FIFO, Thrashing, Working Set Model. Operating System Design issues, I/O Buffering, Disk Scheduling (FCFS, SCAN, C-SCAN, and SSTF), and Disk Caches

Text Books:

1. C.M. Krishna and G.Shin, Real Time Systems, McGraw-Hill International Edition, 1997.

Course Code	Course Title	L	T	P	C
192110EC	WRITING FOR THE MEDIA	5	0	0	4

Objectives:

- To understand the basics of operating systems tasks and basic OS architectures and develop these to RTOS
- To understand concepts of task scheduling
- To understand problems and issues related with multitasking
- To learn strategies to interface memory and I/O with RTOS kernels
- To impart skills necessary to develop software for embedded computer systems using

UNIT 1:

Radio and its potential: An Introduction-Types of Programmed: A Summary- Essential Production techniques: Adapting for radio

UNIT 2:

Radio talk and Profile -Radio Documentary-Radio Interviews and Discussions- Radio plays

UNIT 3:

Writing for Children: Radio- Television and its potential: An Introduction

Types of Programmed: A Summary- Essential production Techniques: Adapting for TV

UNIT 4:

Adapting for TV-Plays and Serials- TV Ads -TV and Video Magazines

UNIT 5:

Television Documentary - Writing for Television: Children

Course Code	Course Title	L	T	P	C
19212OEC	Applicable Mathematical Techniques	4	0	0	3

Outcomes:

- Students using OR techniques in business tools for decision making
- Students develop Assignment problem and Replacement problems
- Understand the concept of decision analysis and game theory
- Students gets the knowledge about interpolation

UNIT I

Interpolation with unequal intervals; Newton's, LaGrange's, and inverse interpolation

UNIT II

Assignment Problems

UNIT III

Replacement Problems

UNIT IV

Decision Analysis

UNIT V

Game Theory

References

Unit I, "Numerical Methods in Science and Engineering" M.K. Venkatraman

Units II to V, "Operations Research", Kantiswarup, P.K. Gupta and Manmohan

Course Code	Course Title	L	T	P	C
19213OEC	BIO MEDICAL INSTRUMENTATION	4	0	0	3

UNIT I BIOSIGNAL CHARACTERISTICS AND ELECTRODECONFIGURATIONS

Bio signals characteristics – frequency and amplitude ranges. ECG – Einthoven's triangle, standard 12 lead system. EEG – 10-20 electrode system, unipolar, bipolar and average mode. EMG– unipolar and bipolar mode.

UNIT II SIGNAL CONDITIONING CIRCUITS

Need for bio-amplifier - differential bio-amplifier, Impedance matching circuit, isolation amplifiers, Power line interference, Right leg driven ECG amplifier, Band pass filtering

UNIT III MEASUREMENT OF NON-ELECTRICAL PARAMETERS

Temperature, respiration rate and pulse rate measurements. Blood Pressure: indirect methods - Auscultator method, direct methods: electronic manometer

UNIT IV

Systolic, diastolic pressure, Blood flow and cardiac output measurement: Indicator dilution, and dye dilution method, ultrasound blood flow measurement.

UNIT V BIO-CHEMICAL MEASUREMENT

Blood gas analysers and Non-Invasive monitoring, colorimeter, Sodium Potassium Analyser, spectrophotometer, blood cell counter, auto analyser (simplified schematic description)

TEXT BOOKS:

1. Leslie Cromwell, "Biomedical Instrumentation and measurement", Prentice hall of India, New Delhi, 2007.

REFERENCES:

1. Myer Kutz, "Standard Handbook of Biomedical Engineering and Design", McGraw Hill Publisher, 2003.

Course Code	Course Title	L	T	P	C
19214OEC	Green Chemistry	4	0	0	3

Objectives: To learn about the environmental status, public awareness in evolution, principles involved in green chemistry, bio-catalytic reactions, global warming and its control measures, availability of green analytical methods.

Unit I - Introduction

Introduction-Current status of chemistry and the Environment-Evolution of the Environmental movement: Public awareness - Dilution is the solution to pollution prevention.

Unit II - Principles

Green Chemistry - Definition - Principles of Green Chemistry - Why is this new area of Chemistry getting to much attention - Why should chemist pursue the Goals of Green Chemistry - The roots of innovation - Limitations.

Unit III - Bio Catalytic Reactions

Green Chemistry Using Bio Catalytic Reactions - Introduction - Fermentation and Bio transformations - Production of Bulk and fine chemicals by microbial fermentation Antibiotics - Vitamins - Bio catalysis synthesis of industrial chemicals by bacterial constructs - Future Trends.

Unit IV - Green House Effect

Greenhouse effect and Global Warming - Introduction - How the greenhouse effect is produced - Major sources of greenhouse gases - Emissions of CO₂ - Impact of greenhouse effect on global climate - Control and remedial measures of greenhouse effect - Global warming a serious threat - Important points.

Unit V - Green Analytical Methods

Future trends in Green Chemistry - Green analytical methods, Redox reagents, Green catalysts, Green Nano-synthesis, Green polymer chemistry, Exploring nature, Biomimetic, Proliferation of solvent-less reactions; Non-covalent derivatization, Biomass conversion, emission control

Course Code	Course Title	L	T	P	C
192150EC	BIO ANALYTICAL TECHNIQUES	4	0	0	3

UNIT 1:

Spectroscopy and Chromatography Concepts of spectroscopy, Visible and UV spectroscopy, Laws of photometry, Beer-Lambert's law, Principles and applications of colorimetric, Chromatography – Principles of partition chromatography, paper, thin layer, ion exchange and affinity chromatography, gel permeation chromatography, HPLC and FPLC .

UNIT 2:

Centrifugation Principles of centrifugation, concepts of RCF, different types of instruments and rotors, preparative, differential and density gradient centrifugation, analytical ultra-centrifugation, determination of molecular weights and other applications, subcellular fractionation.

UNIT 3:

Electrophoretic techniques Principles of electrophoretic separation. Continuous, zonal and capillary electrophoresis, different types of electrophoresis including paper, cellulose, acetate/nitrate and gel. Electroporation, pulse field gel electrophoresis

UNIT 4:

Viscosity – Viscosity of macromolecules, relationship with conformational changes.

UNIT 5:

Electron microscopy Transmission and scanning, freeze fracture techniques, specific staining of biological materials. ORD, CD, X-ray diffraction, X-ray absorption, NMR.

Course Outcome

Students will learn about various spectroscopic and Chromatographic techniques and their applications

Students will learn about various centrifugations techniques and their applications

Course Code	Course Title	L	T	P	C
19261OEC	INSURANCE SERVICES	6	0	0	5

Unit – 1

Risk management – Objectives of risk management – Risk management process – Identifying and evaluating potential losses – Selecting appropriate technique for treating loss exposure – Risk financing – Implementing and administering risk management program – Personal risk management – Loss forecasting

Unit – 2:

Risk Assessment, Analysis, Evaluation, Risk Control and Treatment - Risk Reduction - Transfer and Sharing of Risk - Elimination and Retention of Risk

Unit 3:

General Insurance Business - Fundamental principles of general insurance – Fire insurance – Marine insurance – Motor insurance – Personal accident insurance – Liability insurance – Miscellaneous Insurance – Claims settlement

Unit 4:

Meaning of rate/premium, Objectives of rate making, Rate making in life insurance business – Basic methods of rate making – Net single premium – Net annual level premium – Premium concepts – Level premium – Basic premium – Office yearly premium – Premium tables – Tabular premium – Rebate – Extra premium – Rider premium – Bonus – Calculation of premium and bonus.

Unit 5:

Rate making in general insurance business – Principles – Basic methods of rate making – Judgment rating – Class rating – Merit rating.

Suggested Readings:

1. George Rejda, Principles of Risk Management and Insurance, Pearson Education.
2. S. Balachandran, General Insurance, Insurance Institute of India.

Course Code	Course Title	L	T	P	C
19280OEC	COUNSELLING PSYCHOLOGY	6	0	0	5

UNIT 1:

Definition and areas of psychology, Branches of psychology. Approaches to study psychological process: biological, psychodynamic, behaviorist, cognitive, humanistic. Methods: experimental, observation, field study, questionnaire and case study. Psychology and social issues. Application in education, environment, health.

UNIT 2:

Nervous system-Its Basic structure and functions. Neuron-Central Nervous system, brain, spinal cord. Peripheral nervous system-its division, the cerebral hemispheres, endocrine glands, heredity and behavior, consciousness-levels and psychological basis, biofeedback.

UNIT 3:

Visual, auditory and other senses-Structure and functions-Illusions-Social perception Perceptual organization. Determinants of perception-Form, space and depth perception Attention process- Selective and sustained attention- Attention and vigil

UNIT 4:

Learning classical and operant conditioning. Basic processes-Extinction, spontaneous recovery, generalization and discrimination, reinforcement schedules, verbal learning, cognition in learning, motivational and cognitive influence on learning, observational learning, transfer of learning, psychological basis of learning.

UNIT 5:

Encoding, storage and retrieval process- Sensory, short term and long term memory, Constructive memory-Forgetting-Decay, interference, retrieval failure, motivated forgetting and amnesia. Techniques to improve retention and retrieval processes.

References:

1. Baron, R.A. (2002). Psychology (5TH ed), India Pearson Education, Asia.

Course Code	Course Title	L	T	P	C
19220SEC42	Human Computer Interaction	6	0	0	5

UNIT I

The interaction: Introduction - Models of interaction - Frameworks and HCI - Ergonomics Interaction Styles - Elements of WIMP interface - Interactivity - The Context of the interaction Paradigm: Introduction Paradigms for interaction.

UNIT II

Interaction Design basics: Introduction - what is design? - User focus - Scenarios Navigation design - Screen design and layout - Interaction and prototyping - HCI in the software process: Introduction - The software lifecycle - Usability engineering – interactive design and prototyping – Design rationale.

UNIT III

Design rules: Introduction - Principles to support usability - Standards – Guidelines- Golden rules and heuristics - HCI patterns - Implementation Support: Introduction -elements of windowing systems - Programming the application - Using toolkits- User interface management systems.

UNIT IV

Evaluation techniques: What is evaluation - Goals of evaluation - Evaluation through expert analysis - Evaluation through user participation - Choosing an evaluation method - Universal Design: Introduction - Universal design principles - Multi-modal interaction - Designing for diversity?

UNIT V

User Support: Instruction - Requirements of user support - Approaches to user support Adaptive help system - Designing user support systems.

REFERENCES:

1. "Human-computer Interaction" - Alan Dix - Pearson Education - 2004.

Course Code	Course Title	L	T	P	C
19220DSC43B	Multimedia and its applications	4	0	0	4

OBJECTIVES:

- To making multimedia presentation.
- To learn the Multimedia animation.
- To study about multimedia and Internet concepts

UNIT-I:

Introduction – Definition- Multimedia Hardware- Multimedia Software- MULTIMEDIA networking- Multimedia Applications- Multimedia Environments- Multimedia Computer Components- Multimedia Standards- Multimedia PC.

UNIT-II:

Multimedia Information Systems: Limitations: In workstation operating systems, Middleware System Services Architecture: Goals of Multimedia System Services- Multimedia System Services Architecture Text: Elements of Text- Using Text in Multimedia Applications- Graphics: Element of Graphics- Images and Color- Graphics file and Application Formats- Obtaining Images for Multimedia use- Using Graphics on Multimedia Applications.

UNIT-III:

Digital Audio Representation and Processing: Uses of Audio in Computer Applications- Digital Representations of sound- Transmission of Digital Sound- Digital Audio Signal Processing, Video Technology: Raster Scanning Principles- Sensors for TV Cameras- Color fundamentals- Color Video- Digital Video and Image Compression: Evaluating Compression System- Video Compression Techniques- JPEG Image Compression Standard- MPEG motion Video Compression Standard.

UNIT-IV:

Multimedia Communications Systems: Applications Network Services- Network Protocols. Multimedia Conferencing: Teleconferencing systems- Requirements for Multimedia Communications- Multimedia Conferencing Architectures.

UNIT-V:

Multimedia and Internet: Internet- Client/Server Technology- Communications protocol- Internet Addressing- Internet Functions- HTML and Web Authoring. Multimedia

development Team: Team Approach- Assembling multimedia Production Team- Multimedia Development Process: Multimedia Project- Structured Multimedia development- casting multimedia project.

OUTCOMES:

- Enhance the perspective of modern computer system with modeling, analysis and interpretation of 2D and 3D visual information.
- Able to understand different realizations of multimedia tools
- Able to develop interactive animations using multimedia tools
- Gain the knowledge of different media streams in multimedia transmission

REFERENCE BOOK:

1. For Unit I: Toy Vaughan, "Multimedia making it work", 4th Edition Tata McGraw – Hill Edition, 2000.
2. For Units II, III, IV: John E. Koegel Buford, "Multimedia Systems", Published by Addison Wesley Longman, 3rd Edition year 2000.
3. For Unit V: David Hillman, "Multimedia Technology and Applications", Galgotia Publications Pvt. Ltd., year 1998.
4. Fred T. Hofstetter, "Multimedia Literacy", McGraw Hill, 1995.

Course Code	Course Title	L	T	P	C
19220DSC43C	Middleware Technology	4	0	0	4

UNIT I INTRODUCTION

Emergence of Middleware – Objects, Web Services – Middleware Elements – Vendor Architecture – Interoperability – Middleware in Distributed Applications – Types of Middleware Transaction-Oriented Middleware – MOM – RPC.

UNIT II OBJECT ORIENTED MIDDLEWARE

OOM – Developing with OOM – Heterogeneity – Dynamic Object Request – Java RMI – COM+.

UNIT III COMPONENT OBJECT RESOURCE BROKER ARCHITECTURE (CORBA)

Among – Trading – Life Cycle – Persistence – Security – CORBA.

UNIT IV WEB SERVICES

Introduction – XML Web Services standards – Creating Web Services – Extending Web Services – Messaging Protocol – Describing – Discovering – Securing.

UNIT V OTHER TYPES OF MIDDLEWARE

Real-time Middleware – RT CORBA – Multimedia Middleware – Reflective Middleware – Agent-Based Middleware – RFID Middleware.

REFERENCES BOOKS

1. Chris Britton and Peter Eye, "IT Architecture and Middleware", Pearson Education, 2nd Edition, 2004.
2. Wolfgang Emmerich, "Engineering Distributed Objects", John Wiley, 2000.



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**SCHOOL OF ARTS AND SCIENCE
DEPARTMENT OF COMPUTER SCIENCE**

VALUE ADDED COURSE SYLLABUS-2019-2020

COURSE: DIPLOMA IN MAT LAB

SUBJECT CODE: (19CCML01)

MODULE -I

Basics of Mat lab and MATLAB Compiler

The Mat lab user interface, working with Mat lab data types, Creating matrices and arrays

MODULE -II

Operators and control statements, Using scripts and functions, Data import and export

MODULE -III

Using the graphical features, Programming with simple examples

MODULE -IV

Discussion of Toolboxes with Applications, Signal Processing, Image Acquisition Toolbox

MODULE -V

Image Processing, Neural Network,

Fuzzy Logic Toolbox. Simulink and Hardware Interfacing (Using Kits: Lego, Raspberry Pi, Mind storms etc.

COURSE: DIPLOMA IN GRAPHICAL PROGRAMMING

SUBJECT CODE: 19CCGP02

MODULE -I

Computer Studies, Typographic Design, Generic Skills, Graphics Principle and Method of Design Introduction to Multimedia, Basic Information, Colour Theory for Computer, Sound Principles

MODULE -II

Visual Communication - Digital Publishing - Principles of Management - Drawing as Basis for 2D and 3D Animation - Design: Character □ Background & Concept - Introduction to Computer Animation - Modelling Using CAD - Web Design - Digital Portfolio Development & Presentation - Multimedia Authoring - Flash & Scripting for the Web - Web Campaign Implementation - Animation the Production Process.

MODULE -III

Composing/Shooting on Film - Project-I + Case Study I - Industrial Training - Live Project - Team Management - Language Career planning and guidance - Sound Recording - Breakdown: Voice -Music & Effects Film

MODULE -IV

Animation Techniques - Frame-based animation vs. vector animation - Creating smooth animations and transitions - Game Development Basics - Game loops and event handling - Collision detection and response - Shader Programming - Introduction to shaders and GLSL - Writing and applying shaders in graphics applications.

MODULE -V

Mathematics for Graphics - Linear Algebra - Vectors and matrices - Matrix transformations - Geometry - Coordinate systems - Geometric transformations (e.g., rotation, scaling)

COURSE: DIPLOMA IN WEB APPLICATION DEVELOPMENT AND HOSTING

SUBJECT CODE: 19CCWAH03

MODULE -I

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 -II

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 -III

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 -IV

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 -V

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

COURSE: CERTIFICATE IN DESIGNING PHOTOSHOP

SUBJECT CODE: 19CCDP04

MODULE I

Computer Studies - Typographic Design - Generic Skills - Graphics Principle and Method of Design Introduction to Multimedia - Basic Information - Colour Theory for Computer - Sound Principles - Visual Communication - Digital Publishing - Principles of Management - Drawing as Basis for 2D and 3D Animation - Design: Character - Background & Concept - Introduction to Computer Animation

MODULE II

Image Editing and Retouching - Working with Layers - Layer Types (Background, Adjustment, Text, and Shape Layers) - Layer Styles and Effects - Layer Masks and Clipping Masks - Image Adjustment and Correction - Color Correction (Levels, Curves, Hue/Saturation) - Brightness and Contrast - Removing Imperfections (Spot Healing Brush, Clone Stamp, Patch Tool)

MODULE III

Design Principles and Typography - Design Principles - Basic Design Principles (Balance, Contrast, Alignment, Repetition) - Color Theory and Application - Creating and Using Color Swatches - Typography in Photoshop - Introduction to Typography (Fonts, Typefaces, and Glyphs) - Text Tool Basics (Formatting, Alignment, and Warping Text) - Creating Text Effects and Styles

MODULE IV:

Advanced Photoshop Techniques - Advanced Selection and Masking - Advanced Selection Techniques (Quick Selection, Magic Wand, Color Range) - Working with Complex Masks and Layer Masks - Using Channels for Selections - Advanced Image Manipulation - Compositing Multiple Images - Creating Realistic Shadows and Reflections - Working with 3D Elements and Textures

MODULE V

Project Work and Advanced Topic - Project Development - Developing a Design Project from Concept to Completion - Applying Photoshop Skills to Real-World Design Problems - Peer Review and Critique of Projects - Workflow Efficiency and Automation - Using Photoshop Actions for Repetitive Tasks - Customizing Workspace and Shortcuts - Efficient Workflow Techniques and Tips

COURSE: CERTIFICATE IN ANDROID APP DEVELOPMENT

SUBJECT CODE: 19CCAAP05

MODULE I

Introduction to Android Development - Getting Started with Android Development - Overview of Android Operating System and Architecture - Setting Up Android Studio and Development Environment - Introduction to Android Project Structure - Creating Your First Android Application (Hello World) - Understanding Android Components - Activities and Lifecycle - Fragments and Lifecycle - Intents and Intent Filters - Understanding Manifest File

MODULE II

User Interface Design - Layouts and Views - Introduction to XML Layouts - LinearLayout, RelativeLayout, ConstraintLayout - Common Views (TextView, Button, ImageView, EditText) - Customizing Views (Styles and Themes) - Advanced UI Design - RecyclerView and Adapter Patterns - Handling User Input (Buttons, Forms) - Dialogs and Toasts - Menus and Navigation Drawers

MODULE III

Application Logic and Data Management - Working with Data - Shared Preferences for Simple Data Storage - SQLite Database and Room Persistence Library - Content Providers and CursorLoader - Networking and APIs - Making Network Requests (HTTP, Retrofit, Volley) - Parsing JSON and XML Data - Handling Asynchronous Tasks (AsyncTask, Coroutine)

MODULE IV

Advanced Android Features - Background Tasks and Services - Introduction to Services and Background Processing - WorkManager for Scheduling Tasks - Broadcast Receivers and Handling System Events - Location and Maps - Working with Location Services - Integrating Google Maps into Your App - Handling Geofencing and Map Interactions

MODULE V

Testing and Debugging - Debugging and Error Handling - Debugging Tools in Android Studio - Logcat and Error Logs - Exception Handling and Crash Reporting - Testing Android Applications - Unit Testing with JUnit - UI Testing with Espresso - Mocking and Test-Driven Development (TDD) Techniques

COURSE: CERTIFICATE IN WEB DESIGNING AND HOSTING

SUBJECT CODE: 19CCOWP06

MODULE I:

Introduction to Web Design and Hosting - Overview of Web Design and Hosting - Evolution of the Web-Importance of Web Design and Hosting-Basic Terminology - Structure of HTML Documents - HTML (HyperText Markup Language) - HTML Basics - Structure of HTML Documents - Common Tags and ElementsAttributes and Forms

MODULE II:

Web Design Principles - Design Fundamentals - Color Theory and Typography - Layout and Grid Systems - User Experience (UX) and User Interface (UI) Design - Accessibility and Usability - Web Content Accessibility Guidelines (WCAG) - Responsive Design Principles - Testing and User Feedback

MODULE III

Web Development Tools - Version Control Systems - Introduction to Git and GitHub - Development Environments - IDEs and Text Editors (e.g., Visual Studio Code, Sublime Text) - Browser Developer Tools - FTP and file management - Monitoring and performance optimization.

MODULE IV:

Introduction to Web Hosting - Hosting Basics - Types of Hosting (e.g., Shared, VPS, Dedicated, Cloud) - Domain Name System (DNS) - FTP and File Management - Web Servers and Configuration - Overview of Web Servers (e.g., Apache, Nginx) - Server Configuration Files - Security Basics (e.g., SSL/TLS) - Deployment and Maintenance - Deployment Strategies - Continuous Integration/Continuous Deployment (CI/CD)

MODULE V:

Emerging Trends and Future Directions - Progressive Web Apps (PWAs) - Web Assembly - Single Page Applications (SPAs) - Serverless Architectures - Design and Develop a Portfolio Site - Implement Responsive Design and Interactivity

COURSE: CERTIFICATE IN DATA VISUALIZATION TOOLS

SUBJECT CODE: 19CCDV01

MODULE I: Introduction to Data Visualization

Overview of Data Visualization - Definition and importance of data visualization - History and evolution of data visualization - Principles of Effective Visualization - Understanding your audience - Designing for clarity, accuracy, and insight

MODULE II: Data Preparation and Cleaning

Data Collection and Importing - Sources of data (databases, APIs, spreadsheets) - Tools for data import (e.g., Python Pandas, Excel) - **Data Cleaning and Transformation** - Handling missing values - Data normalization and standardization - Aggregation and summarization techniques

MODULE III: Visualization Tools and Libraries

Overview of Visualization Tools - Commercial tools (Tableau, Power BI) - Open-source tools (D3.js, Plotly) - **Introduction to Visualization Libraries in Programming Languages** - Python libraries (Matplotlib, Seaborn, Plotly) - JavaScript libraries (D3.js, Chart.js)

MODULE IV: Design Principles for Data Visualization

Visual Perception and Design - Cognitive principles (e.g., Gestalt principles, color theory) - Choosing the right chart type for data - **Designing for User Interaction** - Interactive elements (filters, tooltips, drill-downs) - **User experience (UX) considerations**

UNIT V: Advanced Visualization Techniques

Complex Visualizations - Heatmaps, treemaps, and network diagrams - Geospatial visualizations (maps, choropleth maps) - **Dynamic and Interactive Visualizations** - Animation and transitions - Creating dashboards with interactive elements

Dr.K.Saravanan	<i>SS</i>
Dr.R.Maruthi	<i>R. Maruthi</i>
Dr.AV.Seethalakshmi	<i>D. Anseethalakshmi</i>
G.Preethi	<i>G. Preethi</i>
P.Karthik	<i>P. Karthik</i>
G.Gayathri	<i>G. Gayathri</i>
Dr.K.Raja	<i>K. Raja</i>
Dr.N.E.Gopalan	<i>N. E. Gopalan</i>
Dr.G.Gopinath	<i>G. Gopinath</i>

SS

PRIST Deemed to be University
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Dr. G. Gopinath

Dept of Arts & Science
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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 10.04.2019 at 10 a.m. in, PRIST Deemed to be University, Thanjavur under the chairmanship of DR. Bakrudeen Ali Ahamed.

The following members were present:

1. DR. Bakrudeen Ali Ahamed Prof & HOD., PRIST (Chairman , BOS)
2. DR. L.Chinnappa / Dean, PRIST (BOS, Member)
3. Dr. S. Ramesh, Professor, PRIST (Member, BOS)
4. Dr.S.Moharraj /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)
10. Dr. Rajkumar, Managing Director, Cell Zyme Biotech, Chennai, External Member,
BOS)

The members of the Board have unanimously discussed and carefully reviewed the existing syllabus for (B.Sc Microbiology & M.Sc Microbiology) in detail and made the necessary changes in upcoming (B.Sc Microbiology & M.Sc Microbiology) as mentioned below.


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


Registrar
PRIST Deemed to be University
Thanjavur - 613 403, Tamilnadu

1. Resolved to introduce the following of New courses in the B.Sc., (Microbiology) programme curriculum with effect from 2019-2020

SEMESTER III

1. Immunology / 19116AEC33
2. Immunology Lab/ 19116AEC34L

Introduction of new additional Discipline specific Elective Course

SEMESTER V

1. Proteomics - 19116DSC56A
2. Recombinant DNA Technology-19116DSC65A

For the above list of courses syllabus has to be framed

2. Resolved to introduce the following of New courses in the M.Sc., (Microbiology) programme curriculum with effect from 2019-2020

Inclusion of new Courses


1. 19216 DSC25B- Genomics and Proteomics
2. 19216DSC34A- Plant Tissue Culture
3. 19216DSC34B-Nanotechnology
4. 19216DSC44A- Bioethics and IPR
5. 19216DSC44B-Molecular Immunology
6. 19216DSC25A-Biomolecules
7. 19216SEC41- Pharmaceutical Microbiology
8. 19216SEC43L-Pharmaceutical Microbiology Lab

3. Resolved to introduce the following of New Value added courses

1. Diploma in Agricultural Technology- 19516AGT
2. Certificate course Spirulina cultivation- 19516SPC


The Meeting concluded with thanks from Board of Studies Chairman


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


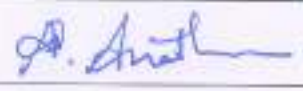


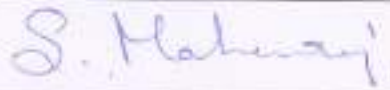
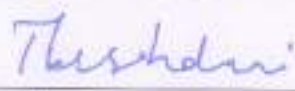


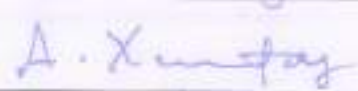


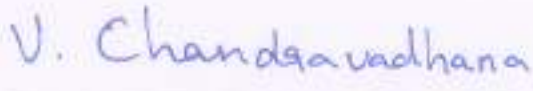

Dean of Arts & Science
PRIST Deemed to be University
Thanjavur - 613 403, Tamilnadu.

Composition of Board of Studies 2019-2020					
S.No	Designation	Name	Qualification	Designation & Affiliation	Mail id
1	Chairperson/HoD	Dr.A.Bakrudeen Ali Ahamed	M.Sc., PhD	Professor, Department of Biochemistry, PRIST Deemed to be University, Vallam, Thanjavur	bakru24@gmail.com
2	External Expert-Academic	Dr. P. Anantharaman	M.Sc., PhD	Professor, CAS in Marine Biology, Annamalai University, Tamil Nadu, India	panantharaman@gmail.com
3	External Expert-Industry	Dr. Rajkumar	M.Sc., PhD	Managing Director, Cell Zyme Biotech, Chennai,	cellzymebiotech@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.Mohunraj	M.Sc.,Ph.D.	Associate Professor, PRIST Deemed to be University, Vallam, Thanjavur	sundar@prist.ac.in
6	Associate Professor	Dr. T. Ushadevi	M.Sc., M.Phil., B. Ed., Ph.D.	Associate Professor, PRIST Deemed to be University, Vallam, Thanjavur	ushadevi29@gmail.com
7	Assistant Professor	Dr.K. Sundar	M.Sc., Ph.D.	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	sathyamm1984@gmail.com
9	Assistant Professor	Dr.A.Xavier Fernando	M.Sc., M.ED M.Phil., Ph.D.	Assistant Professor, PRIST Deemed to be University, Vallam, Thanjavur	a.xavierfernandes@gmail.com
10	Special Invitee-Dean	DR. L.Chinnappa	M.Sc., M.Phil., B. Ed., Ph.D.	Dean, School of Arts and Science, PRIST Deemed to be University, Vallam, Thanjavur	deanarts@prist.ac.in
11	Special Invitee-Alumnus/Alumna	ANJALI B	UG	Omega Microbiology Lab, Thanjavur	anjali@gmail.com
12	Special Invitee -Current student - UG or PG	V.Chandravadhana	PG	Student	chandru.v@gmail.com



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Signature of the Chairman & Members

S.No	Designation	Name	Signature
1	Chairperson/HoD	Dr.A.Bakruddeen Ali Ahamed	
2	External Expert-Academic	Dr. P. Anantharaman	
3	External Expert-Industry	Dr. Rajkumar	
4	Professor	Dr. S. Ramesh	
5	Associate Professor	Dr.S.Mohanraj	
6	Associate Professor	Dr. T. Ushadevi	
7	Assistant Professor	Dr.K. Sundar	
8	Assistant Professor	Dr. R. Saihya	
9	Assistant Professor	Dr.A.Xavier Fernandes	
10	Special Invitee-Dean	DR. L.Chinnappa	
11	Special Invitee-Alumnus/Alumna	ANJALI.B	
12	Special Invitee -Current student - UG or PG	V.Chandravadhana	


HOD
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Course Code	Course Title	L	T	P	C
19116AEC33	Immunology	5	0	0	4

Aim:

Designed to introduce the essential fundamentals of Immunology.

Objectives

- This course focuses on the concepts of immunology
- To create awareness on immunity
- To give knowledge on antigen and antibody
- To learn human diseases and vaccine

Outcomes

- CO1- To understand theory linked to cells and organs related to immune system.
- CO2- Able to know Immune response and immune mechanism.
- CO3- To Understand the mechanism of Immunological disorders.
- CO4- To Learn the importance and precautions of Immunodeficiency syndromes

Unit I

Introduction- History of immunology-scope of immunology. Immunity and their types- Innate and Acquired immunity, Active and Passive immunity. Immune response- Humoral and Cell mediated immune response.

Unit II

Lymphoid organs- primary and secondary lymphoid organs and their role. Cells of the immune system – Stem cell, Lymphocytes, T and B lymphocytes. Plasma cell, T Helper cell, T suppressor cell, T-cytotoxic cell, Null cells, Killer cell, Macrophages. Blood cells and platelets.

Unit III

Antigen- types, chemical nature and essential factors of antigen. Hapten, Adjuvants, Immunoglobulin - Structure, classes, properties and functions. Antigen- antibody reactions.

Unit IV

Complement- Salient features, complement activation, Classical pathway, Alternative pathway, Biological function of complement system. Major-Histocompatibility complex (MHC)- Types and functions.

Unit V

Monoclonal antibodies, Hypersensitivity reactions, Immunoprophylaxis, Vaccines – types, Toxoid and antitoxin, Immunoelectrophoresis, HLA typing, ELISA and RIA

Text Books

S. No	Author Name	Title of the Book	Edition/year	Publisher
1.	Kuby	Immunology	4 th / 2000	W.H. Frumen and Company

Course Code	Course Title	L	T	P	C
19116AEC34L	Immunology Lab	0	0	3	2

Aim

To create the value on Immunology

Objectives

- Acquire knowledge on medical experiments

Outcomes

- CO1- Able to know about principles and techniques Blood grouping
 CO2- To Understand the immunological experiments for clinical field
 CO3- To know the methods of Counting of RBC, WBC and platelets

Lab work

1. ABO Blood Grouping
2. Rh typing
3. WIDAL Test
4. White Blood Cell Count
5. Red Blood Cell Count
6. Antigen preparation
7. Radial Immunodiffusion
8. Double Immunodiffusion
9. Demonstration of ELISA
10. Demonstration of RIA

References

1. O'Gorman, Maurice RG and Albert David Donnenberg. Hand book of human immunology. Boca Raton, FL: CRC press, Francis.2008.
2. Rajan S and Selvi Christy R. Experiments in Microbiology. Anjana Books House, Chennai, 2015.

Course Code	Course Title	L	T	P	C
19116AEC53	Agricultural and Environmental Microbiology	4	1	0	4

Aim:

- To learn about microorganisms in environment

Objectives

- To know the role of microbes in environmental field
- To get information on aquatic Microorganism

Outcome

CO1 - To acquire the information about microbes

CO2 - To Know about microbes and its role in environment.

CO3 - Able to understand about microbes in agriculture and environmental practice.

UNIT – I

Classification of soils. Physical and chemical characteristics and microflora of various soil types. Interactions among microorganisms: Symbiosis – mutualism – commensalisms – competition – amensalism – synergism – parasitism – predation. Biogeochemical cycles. Carbon, nitrogen, phosphorus and sulphur.

UNIT – II

Biofertilizers. Symbiotic nitrogen fixation – (*Rhizobium*, *Frankia*) –Symbiotic nutrient mobilizers – Endomycorrhizae and Ectomycorrhizae – Non symbiotic microbes – *Azotobacter* – *Azospirillum* – Cyanobacteria (*Nostoc*, *Gloeoecapsa Anabaena*)

UNIT – III

Microbial Association with higher plants – Rhizosphere – *Rhizobium* – infection – inoculation – nodule formation. Phylloplane association with animals. A brief account of the symptoms, etiology, life-cycle and management of bacterial (blight of paddy, citrus canker) and fungal (late blight of potato and red rot of sugarcane) diseases.

UNIT – IV

Microbiology of air – organisms in air, distribution and sources. Droplet nuclei, aerosol, assessment of air quality. Types of aquatic ecosystems: fresh water – ponds, lakes, streams. Marine habitats – estuaries, mangroves, deepsea, hydrothermal vents, salt pans, coral reefs. Zonations – upwelling – eutrophication – food chain. Potability of water – microbial assessment of water quality – water purification – brief account of water - borne diseases.

UNIT – V

Types of wastes – characterization of solid and liquid wastes. Solid waste treatment – saccharification – gasification – composting, Utilization of solid wastes – food (SCP, mushroom, yeast); fuel (ethanol, methane, hydrogen); fertilizers (composting). Liquid waste treatment. Treatment methods – primary –secondary (anaerobic – methanogenesis; aerobic- trickling activated sludge – oxidation pond – tertiary treatment.

Course Code	Course Title	L	T	P	C
19116AEC55L	Agricultural and Environmental Microbiology Lab	0	0	3	2

Aim:

- To use appropriate lab techniques and analyze results for routine microbiological samples

Objectives

- To know the role of microbes in environmental field
- To get information on aquatic Microorganism

Outcome

CO1 - To acquire the information about microbes role in agriculture

CO2 - To Learn about Biofertilizer production

CO3 - To Know about microbes and its role in environment

Lab work

1. Isolation and culturing of *Rhizobium* from root nodules.
2. Isolation and culturing of *Azospirillum* from grassplant.
3. Isolation and culturing of *Azotobacter* from paddy field
4. Isolation and culturing of *Phosphobacter* from paddy field
5. Isolation and culturing of Blue Green Algae from paddy field
6. Isolation and identification of air-borne bio-particles using Open plate method
7. Effects of high salt concentration on microbial growth
8. Microbial flora of polluted water – Microbial flora of sewage
9. Bacterial examination of drinking water by membrane filter technique and MPN

Course Code	Course Title	L	T	P	C
19116DSC56A	Proteomics	5	0	0	3

Aim

To acquaint the students to the versatile tools and techniques employed in proteomics.

Objectives

- To illustrate creative use of modern biology linked with proteomics.
- To expose students to importance of proteomics
- To learn different approach and types of proteomics.

Outcome

- CO1- To acquire knowledge in protein functional and expressions.
- CO2- To get Knowledge about 3-D structural prediction of proteins
- CO3- To Study the protein purification with various chromatography techniques.
- CO4- To Know about MALDI-TOF (Matrix assisted laser Desorption and Ionization)

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

Reference Book

1. Hartl, Daniel L., Jones, Elizabeth W. "Genetics: Analysis of Genes and Genomes". Jones and Bartlett Publishers: Boston, 2005.
2. Weaver, Robert F. "Molecular Biology, 2nd Edition". McGraw Hill: Boston, 2002.
3. Colinge, Jacques and Keiryn L. Bennett. "Introduction to Computational Proteomics". PLoS Comput Biol. 2007 July; 3(7): e114.
4. Graves, P. R., T. A. J. Haystead. "Molecular Biologist's Guide to Proteomics". Microbiology and Molecular Biology Reviews: Vol.66 No. 1, 2002.
5. van Wijk, K. J. "Challenges and Prospects of Plant Proteomics". Plant Physiol. 2001 June; 126(2): 501-508.

Course Code	Course Title	L	T	P	C
19116DSC65A	Recombinant DNA Technology	5	0	0	3

Aim

To acquaint the students to the versatile tools and techniques employed in recombinant DNA technology.

Objectives

- To illustrate creative use of modern tools and techniques for manipulation and analysis of genomic sequences
- To expose students to application of recombinant DNA technology in biotechnological research.
- To train students in strategizing research methodologies employing genetic engineering techniques.

Outcome

CO1- To acquire knowledge in desired DNA and protein separation.

CO2- To Learn the gene and operon concept

CO3- To gain Knowledge about gene cloning and cDNA library

CO4- To Learn the blotting techniques.

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.

REFERENCES

1. Mitra (2005). Genetic engineering. Published by Macmillan India Ltd., Chennai.
2. JogdandSN (2005). Gene biotechnology. Himalaya Publishing House, Mumbai.
3. Satyanarayana (2005). Biotechnology. First edition, Books and Allied (P) Ltd, Kolkata.
4. Preeti Joshi (2002). Genetic engineering and its application. First edition, Agrobios (India).
5. Dubey RC (2005). A Text of Biotechnology. Multicolour Illustrative edition, S.Chand and Company Ltd., New Delhi.

Course Code	Course Title	L	T	P	C
19216DSC25A	Biomolecules	5	0	0	4

AIM

To teach students about important biomolecules essential to life processes.

OBJECTIVES:

- To learn the principles of organic chemistry in the structure and function of important biomolecules.
- To understand the structure and function of important biological molecules such as DNA, RNA and some enzymes.
- To understand biological processes such as protein biosynthesis, DNA replication and RNA biosynthesis.

COURSE OUTCOME:

CO1- They acquire knowledge in the quantitative and qualitative estimation of biomolecules

CO2- They study the influence and role of structure in reactivity of biomolecules

CO3- Students have a thorough understanding on the role of biomolecules and their functions.

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.

Text Books

S. No	Author Name	Title of the Paper	Edition/year	Publication
1.	J. L. Jain	Fundamentals of Biochemistry	1 st / 2005	S. Chand and Company

References

1. Biochemistry Dubay 4th edition William C. Brown Publication, 1998.
2. Biochemistry, Davidson and Sittmann, NMS 4th ed. Lippincott William's and Wilkins, 1999
3. Biochemistry – Voet and Voet, J O H N W I V P & Publisher Kaye Pace Associate Publisher, 2011.
4. Biochemistry Student Companion, by Berg, 7th Edition Berg, Jeremy M. / Tymoczko, John L. / Stryer, Lubert Published by W. H. Freeman, 2011.

Course Code	Course Title	L	T	P	C
19216DSC25B	Genomics and Proteomics	5	0	0	4

AIM

To monitor the properties of the entire complement of proteins from a given cell or organism.

OBJECTIVES:

To gain the knowledge and analyze the varying proteomes of an organism at different times in order to highlight differences between them.

COURSE OUTCOME:

CO1- Students gain the knowledge about the interactions between the proteins

CO2- Get the information to predict cell behavior or develop drug targets.

CO3- Rapidly evolving scientific area into *genomes*, proteomes and databases

CO4- Learn to store various data NCBI, DDBJ and EMBL

Unit I

Genomics: genetic and physical maps, physical mapping and map-based cloning, choice of mapping population, simple sequence repeat loci, southern and fluorescence in situ hybridization(FISH) for genome analysis, chromosome microdissection, molecular markers in genome analysis

Unit II

Genome sequencing: genome sizes, organelle genomes, genomic libraries, strategies for genome sequencing, packaging, transfection and recovery of clones, application of sequence information for identification of defective genes. Pharmacogenetics, cancer genetics; immunogenetics; mapping of human genome; somatic cell genetics; DNA polymorphism in mapping; structure and function; biochemical genetics; polygenic inheritance

Unit III

Proteomics: Sample preparation, Gel-based proteomics - two-dimensional gel electrophoresis (2-DGE), two-dimensional fluorescence difference in-gel electrophoresis (DIGE), Staining methods, PF-2D, Tandem FPLC, Mass spectroscopy: basic principle, ionization sources, mass analyzers, different types of mass spectrometers (MALDI-TOF Q-TOF, LC-MS).

Unit IV

Nuclear magnetic resonance spectroscopy (NMR), basic principles, chemical shift, spin-spin interaction, NOE, 2D-NMR, NOESY, COSEY. X-ray Crystallography: Principle of X-ray diffraction, scattering vector, structure factor, phase problem, reciprocal lattice and Ewald sphere, Miller indices, Zone axes, crystal lattice, Lane Equations, Bragg's law, special properties of protein crystals, model building, refinement and R-factor.

Unit V

Protein Engineering: Protein sources, Industrial and medical application of proteins, different expression of proteins for large scale purifications, protein engineering strategy, rational and random mutagenesis. Applications of protein engineering-protein in Chemical and Medical Industries: Generation of heat stable, pH stable enzymes, application in vaccine development, drug development, sensor development.

References

1. Gupta, P.K. 2004. Biotechnology and Genomics. First edition. Rastogi Publications, Meerut.

2. Miglani, G.S. 2007. *Advanced Genetics*. New Delhi: Narosa Publishing House.
3. Primrose, S.B. and Twyman, R.M. 2006. *Principles of Gene Manipulation and Genomics*. Blackwell Publishing, Australia.
4. Singh, B.D. 2009. *Biotechnology: Expanding Horizons*. Second Edition. Kalyani Publishers, Ludhiana.
5. Singh, B.D. 2009. *Plant Biotechnology*. Kalyani Publishers, Ludhiana.
6. Thompson, J.D., Schaeffer-Reiss, C., and Ueffing, M. 2008. *Functional Proteomics. Methods and Protocols*. Humana Press, New York.
7. Twyman, R.M. 2004. *Principles of Proteomics*. Taylor & Francis.

Course Code	Course Title	L	T	P	C
19216SEC34A	Plant Tissue Culture	5	0	0	4

AIM

- To understand the knowledge on culturing **plant** seeds, organs, explants, tissues.

OBJECTIVE

- To understanding the basic process of preparing media for plant tissue culture.
- To learn micronutrients, macronutrients and organic elements.

COURSE OUTCOME

CO1- To inculcate the basics of plant tissue culture

CO2- To impart the knowledge about the various aspects of tissue culture and their applications

CO3- Learn the role of micro and macro- nutrients in tissue culture plantation.

Unit I

Introduction - history, scope and concepts of basic techniques in plant tissue culture. Laboratory requirements and organisation. Sterilization-filter, heat and chemical. Media preparation - inorganic nutrients, organic supplements, carbon source, gelling agents, growth regulators and composition of important culture media (MS, White,s and Gamborg's media).

Unit II

Cell, tissue and organ culture - Isolation of single cells, selection and types of cells, tissue explants and organs for culture - paper, raft nurse technique, plating method, microchamber techniques, cell suspension cultures - batch, continuous, chemostat culture - synchronization of suspension culture, cellular totipotency, cytological, cytochemical and vascular differentiations - totipotency of epidermal and crown - gall cells.

Unit III

Micropropagation - clonal propagation of elite germplasm, factors affecting morphogenesis and proliferation rate, technical problems in micropropagation. Organogenesis - formation of shoots and roots - role of growth regulators and other factors, somaclonal and gametoclinal variations. Somatic embryogenesis - Process of somatic embryogenesis, structure, stages of embryo development, factors affecting embryogenesis, synthetic seeds.

Unit IV

Haploid production - androgenesis, gynogenesis - techniques of anther culture – segmentation pattern in microspore - isolated pollen culture - plantlets from haploids - diploidisation - factors influencing androgenesis, haploidy through gynogenesis, haploid mutants, utilization of haploids in plant breeding. Protoplast culture: Isolation of protoplasts - mechanical and enzymatic sources, culture of protoplasts, viability, Protoplastfusion - spontaneous, mechanical, induced electrofusion, selection of somatic hybrids, cybrids, importance.

Unit V

Cryopreservation and gene bank - Modes of preservation, preparation of materials for deep freezing, cryoprotectors, storage strategies, assessment of successful cryopreservation, application and limitations. Application of tissue culture in forestry, horticulture, agriculture and pharmaceutical industry, transgenic plants.

REFERENCES

1. Bhojwani, S.S. and Razdan, M.K. (1983). *Plant Tissue Culture: Theory and Practice*. Elsevier Science Publishers, Netherlands.
 2. Dodds, J.H. and Roberts, I.W. (1985). *Experiments in Plant Tissue Culture*. Cambridge University Press, UK.
 3. Fowler, M.W. (1986). *Industrial Application of Plant Cell Culture*. In: Yeoman, M. M. (ed.). *Plant Cell Culture Technology*. Blackwell, Oxford, London.
 4. Hammond, J., McGarvey, P. and Yusibov, V. (2000). *Plant Biotechnology*. Springer Verlag, New York.
 5. Johri, B.M. (1982). *Experimental Embryology of Vascular Plants*. Narosha Publishing House, New Delhi.
 6. Kalyan Kumar, De (1992). *An Introduction to Plant Tissue Culture*. New Central Book Agency, Calcutta.
 7. Ramawat, K.G. (2000). *Plant Biotechnology*. S. Chand and Co. Ltd., New Delhi.
 8. Razdan, M.K. (2004). *Introduction to Plant Tissue Culture* (2nd ed.). Oxford and IBH Publishing Co. Pvt. Ltd., New Delhi.
 9. Reinert, J. and Bajaj, Y.P.S. (1977). *Plant Cell Tissue and Organ Culture: A Laboratory Manual*. Narosa Publishing House, New Delhi.
- Vasil, I.K. (1986). *Cell Culture and somatic Cell Genetics of Plants* (3 Volumes). Academic Press Inc.

Course Code	Course Title	L	T	P	C
19216SEC34B	Nanotechnology	5	0	0	4

AIM

To provide basic knowledge in the interface between chemistry, physics and biology on the nanostructural level with a focus on biotechnological usage.

OBJECTIVE

- ❖ Nanoscience is the study of materials which are in nanoscale range. Conversion of any material in nanoscale results in alteration of its physicochemical, biological, mechanical, optical, electronic, etc. properties.
- ❖ To learn advanced research and promote innovation through applications of nanobiotechnology to address issues in health, energy, agriculture and environment.

COURSE OUTCOME

- CO1- Describe the basic science behind the properties of materials at the nanometre scale
 CO2- Advanced experimental and computational techniques for studying nanomaterials.
 CO3- Learn clearly and effectively using conventional scientific and mathematical notation.
 CO4- Systematically solve scientific problems related specifically to nanotechnological materials.

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.

REFERENCES

1. Parthasarathy BK. Introduction to Nanotechnology, Isha Publication. 2007.
2. Elisabeth Papazoglou and Aravind Parthasarathy. Bionanotechnology. Morgan and Claypool Publishers. 2007.
3. Bernd Rehm. Microbial Bionanotechnology: Biological Self-assembly Systems and Biopolymer-based Nanostructures. Horizon Scientific Press. 2006.
4. David E Reisner and Joseph D Bronzino. Bionanotechnology: Global Prospects. CRC Press. 2008.
5. Ehud Gazit. Plenty of Room for Biology at the Bottom: An Introduction to Bionanotechnology. Imperial College Press. 2006.
6. Kamali Kannangara. Nanotechnology: Basic science and emerging technologies- Mick Wilson, Overseas Press. 2005.
7. Mark A Ratner and Bandyopadhyay AK. Nano Materials. Nanotechnology: A gentle introduction to the Next Big Idea, New Age Publishers. 2002.
8. Pradeep T. Nano Essentials understanding nanoscience and Nanotechnology. 1st edition, TMH publications. 2007.
9. Parag Diwan and Asish Bharadwaj. Nanomedicines, Pentagon Press. 2006.
10. Vladimir P Torchilin. Nanoparticles as Drug Carriers. Imperial College Press, North Eastern University, USA. 2006.

Course Code	Course Title	L	T	P	C
19216SEC41	Pharmaceutical Microbiology	6	1	0	6

AIM

To ensure safety and efficacy of pharmaceutical products.

OBJECTIVES

To test and ensure sterility, determine effectiveness, contamination or bioburden, analyze toxins of the drugs.

COURSE OUTCOME

CO1- Acquired detailed knowledge of antimicrobial agents, their mechanism of action.

CO2- Developed understanding of different types of disinfectants/antiseptics bactericidal and bacteriostatic actions

CO3- Regulatory practices, biosensors and applications in Pharmaceuticals.

CO4- Quality Assurance and Validation.

Unit – 1 Antibiotics and synthetic antimicrobial agents

Antibiotics and synthetic antimicrobial agents, Antifungal antibiotics, antitumor substances. Peptide antibiotics, Chloramphenicol, Sulphonamides and Quinolone antimicrobial agents. Chemical disinfectants, antiseptics and preservatives.

Unit – 2 Mechanism of action of antibiotics

Mechanism of action of antibiotics (inhibitors of cell wall synthesis, nucleic acid and protein synthesis). Molecular principles of drug targeting. Drug delivery system in gene therapy. Bacterial resistance to antibiotics. Mode of action of non – antibiotic antimicrobial agents. Penetrating defenses – How the antimicrobial agents reach the targets (cellular permeability barrier, cellular transport system and drug diffusion).

Unit – 3 Microbial production and Spoilage of pharmaceutical Products

Microbial contamination and spoilage of pharmaceutical products (sterile injectibles, non injectibles, ophthalmic preparations and implants) and their sterilization.

Manufacturing procedures and in process control of pharmaceuticals.

Other pharmaceuticals produced by microbial fermentations (streptokinase, streptodornase). New vaccine technology, DNA vaccines, synthetic peptide vaccines, multivalent subunit vaccines. Vaccine clinical trials.

Unit – 4 Regulatory practices, biosensors and applications in Pharmaceuticals

Financing R&D capital and market outlook. IP, BP, USP. Government regulatory practices and policies, FDA perspective. Reimbursement of drugs and biologicals, legislative perspective. Rational drug design. Immobilization procedures for pharmaceutical applications (liposomes). Macromolecular, cellular and synthetic drug carriers. Biosensors in pharmaceuticals. Application of microbial enzymes in pharmaceuticals.

Unit – 5: Quality Assurance and Validation

Good Manufacturing Practices (GMP) and Good Laboratory Practices (GLP) in pharmaceutical industry. Regulatory aspects of quality control. Quality assurance and quality management in pharmaceuticals ISO, WHO and US certification. Safety in microbiology laboratory.

Course Code	Course Title	L	T	P	C
19216SEC43L	Pharmaceutical Microbiology Lab	5	0	0	4

AIM

To provide a knowledge and understanding of pharmaceutical microbiology relevant to healthcare

OBJECTIVES

To gain the knowledge on culture and identification of microorganism, important human pathogens, microbial growth conditions, effect of antimicrobial agents, development of resistance against antimicrobial agents, sterilization and disinfection, bacterial virulence factors, production and control of vaccines.

COURSE OUTCOME

CO1 - Aseptic condition relevance to healthcare and the pharmaceutical industry.

CO2 - Knowledge and understanding of the practical aspects of pharmaceutical microbiology.

CO3 - Perform practicals on antimicrobial activity

CO4- Learn the production of antibiotics from microbes.

Lab Work

1. Introduction to equipment and glassware used in microbiology laboratory (BOD, Incubator, laminar flow, aseptic hood, autoclave, hot air sterilizer, deep freezer, etc..)
2. Study of morphology of different microbes
3. Preparation of various culture media (Determination of microbial colony characteristics)
4. Isolation of pure cultures by streak plate, spread plate & pour plate techniques.
5. Enumeration of bacteria by direct microscopic count.
6. Motility test by Hanging drop method
7. Microbiological assay of antibiotics by cup plate method and other methods
8. Characterization of microbes through Bio-chemical reactions (IMViC)
9. Evaluation of any disinfectant by phenol coefficient test
10. Study of Oligodynamic action (of metals on bacteria)
11. Preservation of microorganisms (slant and stab cultures)
12. Sterility testing of Pharmaceuticals
13. Microbiological Analysis of Water.
14. Production of antibiotics using microbes

Course Code	Course Title	L	T	P	C
19216SEC44A	Bioethics and IPR	5	0	0	4

AIM

- To understand Bioethics and Human Rights in order to assist their application and promotion in the areas of science

OBJECTIVES

- To encourage investigation, analysis and studying the **bioethical** principles, values, concepts, and social and juridical implications contained in the Universal Declaration on **Bioethics**.

COURSE OUTCOME

CO1- Students will gain awareness about *Intellectual Property Rights (IPRs)*

CO2- To take measure for the protecting their ideas

CO3- Able to develop business strategies by taking account of *IPRs*

CO4- Able to assists in technology up gradation and enhancing competitiveness.

Unit I

Bioethics Concept, philosophical considerations, epistemology of science, ethical terms, principles and theories and relevance to biotechnology. Ethics and the law issues - genetic engineering, stem cells, cloning, medical techniques, transhumanism and bioweapons. Research concerns - animal rights, ethics of human cloning, reproduction and stem cell research.

Unit II

Emerging issues - biotechnology's impact on society, DNA on the witness stand and use of genetic evidence in civil and criminal court cases. Challenges to public policy, regulations, improving public understanding of biotechnology products to correct misconceptions.

Unit III Introduction to IPR & Legal Protection

Basics of patents, types of patents, Indian Patent Act 1970, recent amendments, filing patent application, precautions before patenting - disclosure and non-disclosure, WIPO treaties, Budapest treaty, PCT and implications, role of a country patent office and procedure for filing a PCT application. Types of IP - patents, trademarks, copyright & related rights, industrial design, traditional knowledge, geographical indications and international framework for the protection of IP. Introduction to history of GATT, WTO, WIPO and TRIPS. Global scenario of patents and Indian position, patenting of biological materials. IP as a factor in R&D and IP relevance to Biotechnology.

Unit IV Patent Filing and Infringement

Patent application - forms and guidelines, fee structure and time frames. Types of patent applications, provisional and complete specifications, PCT and convention patent applications. International patenting - requirement, procedures and costs.

Financial assistance for patenting and introduction to existing schemes. Publication of patents -gazette of India, status in Europe and US. Patenting by research students, lecturers and scientists. University/organizational rules in India and abroad, credit sharing by workers and financial incentives. Patent infringement - meaning, scope, litigation, case studies and examples.

Unit V Biosafety

Introduction and historical background. Introduction to biological safety cabinets, primary containment for biohazards, biosafety levels, biosafety levels of specific microorganisms, recommended biosafety levels for infectious agents and infected animals. Biosafety guidelines by Government of India. Definition of GMOs and LMOs. Roles of Institutional Biosafety Committee, RCGM, GEAC etc. for GMO's applications in food and agriculture. Environmental release of GMOs, risk assessment; risk management and communication. Overview of national regulations and relevant international agreements including Cartagena protocol.

Important Links

1. Bioethics - by Ellen Frankel Paul, Fred D. Miller, Jeffrey Paul, Fred Dycus Miller Cambridge University Press, 2002.
2. Bioethics & Science, John A. Bryant, Linda Baggott la Velle, John F. Searle - 2002.
3. <http://www.w3.org/IPR/>
4. <http://www.wipo.int/portal/index.html.ca>
5. http://www.ipr.co.uk/IP_conventions/patent_cooperation_treaty.html
6. www.patentoffice.nic.in
7. www.iprlawindia.org/ - 31k - Cached - Similar page

Course Code	Course Title	L	T	P	C
19216SEC44B	Molecular Immunology	5	0	0	4

AIM

To learn immunological response at the molecular, cellular and functional levels of innate and acquired immunity. It includes immune regulation, cell signaling and Immunochemistry.

OBJECTIVES

- ❖ To identify the cellular and molecular basis of immune responsiveness.
- ❖ To describe the roles of the immune system in both maintaining health and contributing to disease.
- ❖ To understanding of humoral and cellular immunity and their relative significances.

COURSE OUTCOME

- CO1 - Able to identify the cellular and molecular basis of immune responsiveness.
- CO2- Learn about Biosensor assays for assessing ligand –receptor interaction.
- CO3- Rationale for vaccine design about new generation antibodies
- CO4- Multi-gene organization of immunoglobulin gene

Unit I Fundamental Concepts and Anatomy of the Immune System

Terminology – Antigen, immunogen, hapten, allergen, tolerogen, super antigens, antibody, immunoglobulin, antigenicity, immunogenicity. Self & nonself, innate & acquired immunity. Haematopoiesis. Organs, tissues, cells and mediators of immune system - primary lymphoid organs, secondary lymphoid tissues, lymphocytes, cytokines and lymphokines. Lymphatic system, lymphocyte circulation and lymphocyte homing. Mucosal and Gut associated lymphoid tissue (MALT&GALT) and mucosal immunity. Principles of cell signaling.

Unit - II Immune Responses Generated by B and T lymphocytes

B cell: B cell development, maturation, activation and differentiation. B cell receptor and determinants. B cell subsets. Immunoglobulins - basic structure, classes & subclasses of immunoglobulins, antigenic determinants, multigene organization of immunoglobulin genes and immunoglobulin super gene family. Generation of antibody diversity.

T cell: T cell development, maturation, activation and differentiation. T cell receptor and determinant. T cell subsets. TCR complex. Antigen processing and presentation - endogenous antigens, exogenous antigens, non-peptide bacterial antigens Cell to cell co-operation and hapten-carrier system.

Unit - III Immune Response

Recognition & response: Non specific and Specific. **Nonspecific:** Natural built-in barrier, phagocytosis. Complements, natural killing, inflammatory response. **Specific:** HI & CMI. Antigen recognition and response. Major Histocompatibility Complex - MHC genes, MHC in immune responsiveness and disease susceptibility. HLA typing. Kinetics of immune response and memory. **Unresponsiveness:** tolerance, suppression and potentiation.

Unit - IV Vaccinology

Active, passive and combined immunization. Live, killed, attenuated, plasma derived, sub unit, recombinant DNA, protein based, plant-based, peptide, anti-idiotypic and conjugate vaccines – production & applications. Role and properties of adjuvants & ISCOMS. Antibody genes and antibody engineering - chimeric and hybrid monoclonal antibodies, catalytic antibodies and generation of immunoglobulin gene libraries.

Unit - V Clinical Immunology

Immunity to infection, bacteria, viral, fungal and parasitic infections (with examples from each group). Hypersensitivity – Type I, II, III and IV. Autoimmunity and types of autoimmune diseases. Mechanism and role of CD4+ T cells, MHC and TCR in autoimmunity. Treatment of autoimmune diseases. Transplantation – immunological basis of graft rejection, clinical transplantation and immunosuppressive therapy. Tumor immunology, tumor antigens, immune response to tumors and tumor evasion of the immune system. Cancer immunology and immunotherapy. Immunodeficiency - primary immuno - deficiencies, acquired or secondary immuno - deficiencies.

Text Books

1. Peter J. Delves, Seamus J. Martin, Dennis R. Burton and Ivan M. Roitt. 2011. Essential Immunology 12th Edition. Wiley - Blackwell.
2. Charles A Janeway, Jr. Paul Travers, Mark Walport, and Mark J Shlomchik. 1999. Immunobiology. 4th Edition. Journal of Current Biology publications.
2. D. M. Weir and John Stewart. 1997. Immunology. 8th Edition. Churchill Livingstone.
3. P.J.Delves, I S.J.Artin, I D.R.Burton and I.M.Roitt. 2006. Essential Immunology. 11th Edition. Wiley - Blackwell.
4. Richard M. Hyde. 2012. Microbiology and Immunology. 3rd Edition. Springer Science & Business Media.

Course Code	Course Title	L	T	P	C
191110EC	Open Elective - Journalism	4	0	0	2

Aim :

- To acquaint with the basic knowledge of journalism

Objective:

- To instil in the minds of students the different aspects of journalism
- To understand the different kinds of news
- To learn the qualities and duties of a reporter, editor and sub-editor
- To familiarize with the style and features of the different sections in a newspaper

Outcome:

- Become a journalist
- Explore the different kinds of news

UNIT- I

Journalism – Definition, Qualities of a journalist, Forms of journalism, Role and elements

UNIT- II

News – Definition, Kinds, Elements, Sources

UNIT- III

Reporters

UNIT- IV

The Editor and the Sub-editor

UNIT -V

Language of Journalism, Style

Qualities of a Writer

Writing a News story, Opinion Pieces, Reviews, Headlines, Editorials

Reference Book:-

Author	Title of the book	Edition / Year	Publisher
Susan	Journalism		
John Hogenberg	Professional Journalism	2012	
M.James Neal	News Writing and Reporting		Surjeet Publication
M.V Komath	The Journalist's Handbook		

Course code	Course Title	L	T	P	C
19112OEC	Open Elective: Development of Mathematics Skills	4	0	0	2

Aim:

- To understand the concepts from the five branches of mathematics

Objectives

- Knowledge and understanding are fundamental to study mathematics and form the base from which to explore concepts and develop problem-solving skills. Through knowledge and understanding students develop mathematical reasoning to make deductions and solve problems.
- To develop student's ability to apply both conventional and creative techniques to the solution of mathematical problems.

Outcomes

- Know and demonstrate understanding of the concepts from the five branches of mathematics (Operations Research, Set Theory, Statistics, Matrices and Business mathematics)
- Use appropriate mathematical concepts and skills to solve problems in both familiar and unfamiliar situations including those in real-life contexts
- Select and apply general rules correctly to solve problems including those in real-life contexts.

Unit I

Simple interest and compound interest

Unit II

Sinking fund – discounting – trade discount – quantity discount – cash discount

Unit III

Set theory – Series

Unit IV

Matrices – Determinants

Unit V

Assignment problems

References

P.A.Navanidham, Business Mathematics & Statistics

Kanti Swarup, P.K.Gupta and Manmohan, "Operations Research"

Course Code	Course Title	L	T	P	C
19H3GEC	Open Elective- Instrumentation	4	0	0	2

Aim:

Making and analyzing measurements is the primary task of the experimental physicist. This includes designing experiments. Most experimental work, whether in bench-top situations, or using complex instruments. To many physicists this can be as interesting and involving as the basic physics one is trying to do.

Objectives:

- ❖ To build the strong foundation in physics of students needed for the field of Instrumentation.
- ❖ To prepare student to apply reasoning informed by the contextual knowledge to practice.
- ❖ To provide opportunity for students to work as part of teams on multi-disciplinary projects.

UNIT – I: INTRODUCTION

Potentiometer - calibration of volt meter and ammeter, measurement of resistance, Principles of network theorems – Thevenin's and Norton's theorem – Bridges : AC bridges – Maxwell, Owen, Schering and deSauty's bridges – Wien bridges.

UNIT – II: ELECTRONIC INSTRUMENTS – I

Basic characteristics of instruments – resolution – sensitivity - Audio frequency oscillator, Conversion of galvanometer into voltmeter and ammeter – resistance meter - Amplified D.C. meter – Chopper stabilized amplifier – A.C. Voltmeter using rectifiers – Electronic multimeter – Differential voltmeter – Digital voltmeters – Component measuring instruments (quantitative studies)

UNIT – III: ELECTRONIC INSTRUMENTS – II

Signal conditioning systems – DC and AC carrier systems – Instrumentation amplifiers – Vibrating capacitor amplifier – Analog to digital data and sampling – A/D and D/A convertor (successive approximation, ladder and dual slope conversions).

Unit IV – Recording Devices

Recorders necessity – Recording requirements – Analog recorders – Graphic recorders – strip chart recorders – Galvanometer types recorders – Null type recorders.

Unit V – CRO

CRO – Construction and action – Beam transit time and frequency limitations – Measurement of potential, current, resistance, phase and frequency – Special purpose oscilloscopes – Sampling storage oscilloscope.

Books for Study

1. Electronic Instrumentation and Measurement techniques – W.D. Cooper and A.D. Helfrick – PHI – Third edn. – 1989

Course Code	Course Title	L	T	P	C
19114OEC	Open Elective-Food and Adulteration	4	0	0	2

Aim:

- To introduce students to food safety and standardization act and quality control of foods.

Objectives:

- To educate about common food adulterants and their detection.
- To impart knowledge in the legislative aspects of adulteration.
- To educate about standards and composition of foods and role of consumer.

Outcomes:

- The students will have knowledge about different processing and preservation methods and principles involved.

Unit-I Introduction to Food Chemistry

Introduction to Food Chemistry- Water (Structure of water and ice, Physical constants of water, Types of water, Water activity) Composition of Food- Carbohydrates, Proteins, Lipids, Vitamins & Minerals.

Unit- II Food Pigments

Introduction- classification, types of food pigments- chlorophyll, carotenoids, anthocyanins, flavanoids.

Unit – III Food Preservation

Introduction - Importance, principle and Types.
High and low temperatures preservation - Pasteurization - Sterilization- Canning- Freezing- Refrigeration.

Unit – IV Food Additives

Introduction- antioxidants, sequestrants, preservatives, nutrient supplement, emulsifiers, stabilizers and thickening agents, bleaching and maturing agent, sweeteners, humectants and anti-caking agents, coloring and flavoring substance.

Unit-V Food Adulteration

Types of adulterants- intentional and incidental adulterants, methods of detection. Detection of common food adulterants in Spices , Grains, Coffee , Tea, Oil fats , Food colours and Milk. Health hazards and risks.

References:

1. The Food Safety and Standard ACT, 2006 – Seth & Capoor
2. Hand book of Food Adulteration and Safety Laws – Sumeet Malik
3. Food Science – B.Srilakshmi

Course Code	Course Title	L	T	P	C
19120OEC	Open Elective -E Learning	4	0	0	2

COURSE OUTCOMES

- ❖ Develop e – learning application on their own.
- ❖ Ability to develop contents for e-learning.
- ❖ To perform course management using tools.

UNIT I INTRODUCTION

Introduction – Training and Learning, Understanding elearning, components and models of e-learning, Advocacy of e-learning – benefits, learning styles, criteria for choosing, - Applications of E-learning.

UNIT II CONCEPTS and DESIGN

E-Learning Strategy, the essential elements of elearning strategy; Quality assuring e-learning, suppliers and resources, virtual learning environments, authoring tools, e-assessment, Learning Design Issues – purpose, general principles, designing live e-learning, designing self managed learning.

UNIT III APPLICATIONS

Moodle 2.0 E-Learning Course Development – Features, Architecture, Installation and Configuring Site.

UNIT IV COURSE MANAGEMENT

Creating – Categories, Courses, Adding Static Course Material – Links, Pages, Moodle HTML Editor, Media Files, Interacting with Lessons and Assignments – Evaluating Students – Quizzes and Feedback.

UNIT V ENHANCEMENT

Adding Social Activities - Chat, Forum, Ratings; Blocks – Types, Activities, Courses, HTML, Online Users – Features for Teachers.

REFERENCE BOOKS:

1. Delivering E-Learning: A complete Strategy for Design, Application and Assessment, Kenneth Fee, Kogan page, 2009.
2. Designing Successful e-Learning, Michael Allen, Pfeiffer Publication, 2007.
3. Moodle 2.0 E-learning Course Development, William Rice, PACKT, 2011.

Course Code	Course Title	L	T	P	C
19120OEC	Open Elective -Web Technology	4	0	0	2

AIM

To equip the students with basic programming skill in Web Technology.

OBJECTIVE

- To understand the concepts and architecture of the Worldwide Web.
- To understand and practice mark up languages
- To learn Style Sheet and Frames

OUTCOMES:

- Acquire knowledge about functionalities of world wide web
- Explore markup languages features and create interactive web pages using them
- Learn and design Client side validation using scripting languages
- Acquire knowledge about Open source JavaScript libraries
- Able to design front end web page and connect to the back end databases.

UNIT I

Introduction to the Internet: networking- internet – email – Internet Technologies: modem internet addressing .

UNIT II

Internet browsers: Internet Explorer – Netscape navigator- Introduction to HTML: Html document – anchor tag – hyperlink.

UNIT III

Head and body sections: Header section – titles – links- colorful web page – sample html document – Designing the body section: paragraph – tab setting.

UNIT IV

Ordered and unordered lists: list – unordered list – heading in a list- order list- nested list.

UNIT V

Table handling: tables – table creation in html cell spanning multiple rows and columns- coloring cells- sample tables- frames frame set definition- nested frames set.

REFERENCE BOOKS

1. World Wide Web design with HTML – C. Xavier – Tata McGraw – Hill – 2000.
2. Principles of web design – Joel Sklar – Vikas publishing house 2001.

Course Code	Course Title	L	T	P	C
19161OEC	Open Elective – Banking Service	4	0	0	2

AIM:

To Provide the Bank is financial institution which is involved in borrowing and lending money.

OBJECTIVE:

- To provide a lending money to firms, customers and home buyers.
- To provide keep money for customers
- To provide offering financial advice and related financial services, such as insurance.

OUTCOME:

To help to gather knowledge on banking and financial system in India

To provide knowledge about commercial banks and its products

To create awareness about modern banking services like e-banking-banking and internet banking, ATM System

To introduce recent trends in banking system

To make the student understand the basic concept of banking and financial institutions and expose various types of risk based by banks

UNIT – I

Commercial Banking – An Overview: Banking-Classification- Banking system- Universal Banking- Commercial Banking- functions – Role of Banks in Economic Development

UNIT – II

E-banking –An Overview: Meaning-Service-E-banking and Financial Services –Benefits-Internet Banking –Internet Banking Vs Traditional Banking –Mechanics of Internet Banking-Services

UNIT – III

Mobile Banking and Telephone Banking –An Overview: Meaning-Features-Registration-Services –Security Issues –Banking Facilities- Telephone Banking System – Drawbacks- Call Centers

Unit – IV

ATM and Electronic Money: Concept of ATM-Features-Functions-Strategic importance of ATM- Electronic Money – Categories –Merits – E-Money and Monetary Policy-Policy Issues for the RBI

Unit-V

EFT System and INFINET: Meaning- Steps in EFT- RBI Guidelines-EFT Systems Vs Traditional System - ECS-Features-Factors- Benefits –Handicaps -Applications

REFERENCES:

1. Banking theory law and Practice
2. Banking Theory law and practice -Santhanam
3. Banking Awareness - N.K.Gupta
4. Management of Banking and financial Services-Padmalthasuresh,Justin paul.



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School of Arts and Science
Department of Microbiology
B. Sc., Syllabus-Regulation 2019

COURSE STRUCTURE

Course Code	Course Title	L	T	P	C
SEMESTER I					
19110AEC11/ 19111AEC11/ 19132AEC11/ 19135AEC11	Language-I (Tamil-I/ Advanced English-I/ Hindi-I/ French-I	4	0	0	2
19111AEC12	English-I	4	0	0	2
19116AEC13	Fundamentals of Microbiology	6	0	0	4
19116AEC14L	Fundamentals of Microbiology Lab	0	0	3	2
19115AEC15B	Bio Chemistry I	6	1	0	5
19115AEC16BL	Bio Chemistry I Lab	0	0	3	2
191 SEC01	Skill Based Elective-I	0	0	2	1
19111SEC01L	Communicative English Lab-I	0	0	1	1
191INDCONS	Indian Constitution	-	-	-	-
	Total	20	1	9	19
SEMESTER II					
19110AEC21/ 19111AEC21/ 19132AEC21/ 19135AEC21	Language-II (Tamil-II/ Advanced English-II / Hindi-II/ French-II)	4	0	0	2
19111AEC22	English-II	4	0	0	2
19116AEC23	Microbial Physiology	6	1	0	4
19116AEC24L	Microbial Physiology Lab	0	0	3	2
19115AEC25	BioChemistry II	6	0	0	5
19115AEC26L	Bio Chemistry II Lab	0	0	3	2
19116RLC27	Research LED Seminar	-	-	-	1
191 SEC02	Skill Based Elective -II	0	0	2	1
19111SEC02L	Communicative English Lab-II	0	0	1	1
	Total	20	1	09	20
SEMESTER III					

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19110AEC31/ 19111AEC31/ 19132AEC31/ 19135AEC31	Language-III (Tamil-III/ Advanced English-III / Hindi-III/ French-III)	4	0	0	2
19111AEC32	English-III	4	0	0	2
19116AEC33	Immunology	5	0	0	4
19116AEC34L	Immunology Lab	0	0	3	2
19112AEC35	Biostatistics	5	1	0	5
19112AEC36L	Biostatistics Lab	0	0	3	2
19116RMC37	Research Methodology	2	0	0	2
191 SEC03	Skill based Elective- III	0	0	2	1
19111SEC03L	Communicative English Lab-III	0	0	1	1
	Total	20	1	09	21
	SEMESTER IV				
19110AEC41/ 19111AEC41/ 19132AEC41/ 19135AEC41	Language-IV (Tamil-IV/ Advanced English-IV/ Hindi-IV/ French-IV)	4	0	0	2
19111AEC42	English-IV	4	0	0	2
19116AEC43	Virology	5	0	0	4
19116AEC44L	Virology Lab	0	0	3	2
19116AEC45	Bioinformatics	6	0	0	5
19116AEC46L	Bioinformatics Lab	0	0	3	2
191 SEC04	Skill based Elective- IV	0	0	2	1
19111SEC04L	Communicative English Lab-IV	0	0	1	1
191ENVTSTU	Environmental Studies	2	0	0	2
	Total	21	0	9	21
	SEMESTER V				
19116AEC51	Food and Dairy Microbiology	5	0	0	4
19116AEC52	Molecular Biology	5	0	0	3
19116AEC53	Agricultural and Environmental Microbiology	4	1	0	4
19116AEC54L	Food and Dairy Microbiology and Molecular Biology Lab	0	0	3	2
19116AEC55L	Agricultural and Environmental Microbiology Lab	0	0	3	2
19116DSC56	Discipline Specific Elective -I	5	0	0	3
19116BRC57	Participation in Bounded Research	-	-	-	1
191 SEC05	Skill based Elective- V	0	0	2	1
19111SEC05L	Communicative English Lab-V	0	0	1	1
	Total	19	1	9	21
	SEMESTER VI				
19116AEC61	Industrial Microbiology	5	0	0	4

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19116SEC62	Clinical Microbiology	5	0	0	5
19116AEC63L	Industrial Microbiology Lab	0	0	3	2
19116SEC64L	Clinical Microbiology Lab	0	0	3	2
19116DSC65	Discipline Specific Elective - II	5	0	0	3
191—OEC	Open Elective	4	0	0	2
19116PRW67	Project Work	-	-	-	4
191__SEC06	Skill Based Elective -VI	0	0	2	1
19111SEC06L	Communicative English Lab-VI	0	0	1	1
19116EXACT	Extension activities	-	-	-	-
19116PEE	Programme exit examinations	-	-	-	1
	Total	19	0	9	25
	Total Credits for the Programme				127

Discipline Specific Electives

Semester	Discipline Specific Elective Courses-I
V	a) 19116DSC56A - Proteomics b) 19116DSC56B - Bioinoculants
	Discipline Specific Elective Courses-I
VI	a) 19116DSC63A-Recombinant DNA Technology b) 19116DSC65B - Bioethics

Open Electives

Semester	Open Elective Courses
VI	a) 19110OEC - Tamil Ilakiya varalaru b) 19111OEC - Journalism c) 19112OEC - Development of Mathematical Skills d) 19113OEC - Instrumentation e) 19114OEC - Food and Adulteration f) 19120OEC - E-Learning g) 19122OEC - Web Technology h) 19161OEC - Banking services

Skill based Electives

Semester	Skill based Elective Courses
I	a) 19120SEC01AL - Package Lab - I b) 19160SEC01B - Soft skill - I
II	a) 19120SEC02AL - Package Lab - II b) 19160SEC02B - Soft skill - II
III	a) 19120SEC03AL - Package Lab - III

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	b) 19160SEC03B-Soft skill – III
IV	a) 19120SEC04AL-Package Lab –IV b) 19160SEC04B- Soft skill – IV
V	a) 19120SEC05AL-Package Lab –V b) 19160SEC05B-Soft skill - V
VI	a) 19120SEC06AL-Package Lab –VI b) 19160SEC06B-Soft skill – VI

Credit Distribution

Sem	AEC	SEC	DSC	OEC	Research	Others	Total
I	17	2	-	-	-	-	19
II	17	2	-	-	1	-	20
III	17	2	-	-	2	-	21
IV	17	2	-	-	-	2	21
V	12	5	3	-	1	-	21
VI	06	9	3	2	4	1	25
Total	86	22	6	2	08	3	127

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M. Sc Microbiology -SYLLABUS – REGULATION 2019
Academic year 2019-2020
COURSE STRUCTURE

Course Code	Course Title	L	T	P	C
SEMESTER I					
19216SEC11	Prokaryotic Microbiology	6	1	0	5
19216SEC12	Eukaryotic Microbiology	6	1	0	5
19216SEC13	Microbial Physiology	6	1	0	4
19216SEC14L	Fundamentals of Microbiology Lab	0	0	4	2
19216DSC15	Discipline Specific Elective	5	0	0	4
19216RLC16	Research Led Seminar	-	-	-	1
Total		23	3	4	21
SEMESTER II					
19216SEC21	Industrial Microbiology	5	1	0	5
19216SEC22	Environmental and Agricultural Microbiology	5	1	0	5
19216SEC23	Clinical Microbiology	5	0	0	4
19216SEC24L	Industrial, Clinical and Environmental and Agricultural Microbiology Lab	0	0	4	2
19216DSC25	Discipline Specific Elective II	5	0	0	4
19216RMC26	Research Methodology	3	0	0	2
19216BRC27	Participation in Bounded Research	-	-	-	2
Total		23	2	4	24
SEMESTER III					
19216SEC31	Microbial Genetics	6	1	0	6
19216SEC32	Microbial Biotechnology	6	1	0	6
19216SEC33L	Microbial Genetics and Biotechnology Lab	0	0	5	3
19216DSC34	Discipline Specific Elective III	5	0	0	4
192_OEC	Open Elective	4	0	0	4
19216SRC35	Design/Socio technical research	-	-	-	2
Total		21	2	5	24
SEMESTER IV					
19216SEC41	Pharmaceutical Microbiology	6	1	0	6
19216SEC42	Biostatistics and Bioinformatics	6	1	0	6
19216SEC43L	Pharmaceutical Microbiology Lab	0	0	5	3

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19216SEC44	Discipline Specific Elective IV	5	0	0	4
19216PRW45	Project Work	-	-	-	6
19216PEE	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)19216DSC15A- Immunotechnology b)19216DSC15B-Bioremediation and Waste Management
	Discipline specific Elective Courses-II
II	a)19216DSC25A-Biomolecules b)19216 DSC25B- Genomics and Proteomics
	Discipline specific Elective Courses-III
III	a)19216DSC34A- Plant Tissue Culture b)19216DSC34B-Nanotechnology
	Discipline specific Elective Courses-IV
IV	a)19216DSC44A- Bioethics and IPR b)19216DSC44B-Molecular Immunology


General Electives

Semester	Open Elective Courses
III	a) 19211OEC-Writing for the Media b) 19212OEC-Applicable Mathematics Techniques c) 19213OEC-Bio-medical Instrumentation d) 19214OEC-Green Chemistry e) 19220OEC-M-Marketing f) 19261OEC- Insurance Services g) 19280OEC-Counselling Psychology

Credit Distribution:

Sem	SEC	DSC	GEC	RSB courses	Other s	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


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DEPARTMENT OF MICROBIOLOGY

M.PHIL MICROBIOLOGY SYLLABUS - REGULATION 2017

COURSE STRUCTURE

SEMESTER - I					
COURSE CODE	COURSE TITLE	L	T	P	C
193RMG11 (Common Paper)	Research Methodology	2	2	0	2
193MBC12	Advanced Microbiology	2	2	0	2
193MBE13	A. Microbial Biotechnology	2	2	0	2
	B. Bioprocess and Enzymic Engineering				
	Total	06	06	00	06
SEMESTER - II					
193MBC21	Project Work				02


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SCHOOL OF ARTS AND SCIENCE

DEPARTMENT OF MICROBIOLOGY

DEPARTMENT OF LIFE SCIENCE

SYLLABUS
FOR


Add on Course

Diploma in Agricultural Technology

Course Co-ordinator

Dr. T. Ushadevi


Head of the Department
Department of Microbiology
School of Arts & Science
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DEPARTMENT OF MICROBIOLOGY
Add on Course
Diploma in Agricultural Technology
Course code – 19516AGT

Duration : 90 Hrs

Unit I

Agriculture: definition, meaning and its branches, Agronomy:-definition, meaning and scope of agronomy. Classification of field crops. Factors affecting on crop production. Classification of Tillage: Influence of tillage on physical properties of soil. Planting geometry and its effect on growth and yield.

Unit II

Cropping systems: Definition and types of cropping systems. Sustainable Agriculture: Introduction, definition, goal and concepts. Land degradation and conservation of natural resources. Soil and climatic requirements, cultural practices viz., selection of seeds, seed treatment, sowing method, seed rate, fertilizer recommendation, time and method of application of manures.

Unit III

Bio-fertilizers, thinning, gap filling, earthing up, interculturing, weed control measures, irrigation, crop rotation, inter-mixed/relay cropping, major insect-pests and diseases, harvesting, threshing, winnowing, cleaning, drying, storage, preparation of produce for market, value addition, high yielding improved and hybrid varieties, yield, main and sub research stations.


Unit IV

Cereals–Major crops: rice, maize, **Pulses**: pigeonpea, mung bean, **Oilseeds**: groundnut, castor, sunflower and sesame. **spices**– Fennel. **Fibre crops**: cotton and sunhemp. **Commercial crop**: tobacco.

Unit V

Introduction and importance of micro organisms. Growth and development of science of microbiology. Morphological, structural, cultural and physiological characters of bacteria. Importance and functions of micro organisms in relation to decomposition of organic matter. Microbial fermentation and importance of microbes in soil, food, milk and sewage water. Role of microbes in Carbon, Nitrogen, Phosphorus and Sulphur cycle. Importance, production and application of biofertilizers.


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Unit VI

Scope, definition and Concept of organic farming. Objectives of organic farming. Importance of organic farming. Components of organic farming and their role in sustainable crop production. Principles of organic farming. Organic farming in relation to soil health and quality production. Nutrient management in organic farming. Disease and pest management in organic farming. Certification and accreditation process of organic products.

Unit VII

Crop Water Requirement and Management Crop water requirement – Potential evapotranspiration (PET) and consumptive use – Definition and estimation – Factors affecting water requirement – Effective rainfall – Critical stages for irrigation – Water requirement of crops – Water management for major field crops.

Unit VIII

Methods of Irrigation Scheduling of irrigation – Different approaches – Methods of irrigation: surface, sub – surface, sprinkler and drip irrigation – Micro irrigation: layout, suitability, merits and demerits – Fertigation – Water use efficiency – Methods to improve WUE – Conjunctive use of surface and ground water.

Unit IX

Introduction to post harvest technology of agricultural produce. Post-harvest operations process for cereal, pulse and oil seed crops. Equipment used in post harvest operations. Study of cotton ginning. Post-harvest study of sugarcane. Study of cold storage and warehouse.


Reference

Transfer of Agricultural Technology. R.R. Chole/P.R. Deshmukh/P.S. Kapse India
2010. Scientific publishers.

Agro-Technology: A Philosophical Introduction, Textbook by R. Paul Thompson. 2011. Cambridge
University Press

A Handbook of Agricultural Technology (PB). Panda SC. 2012


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SCHOOL OF ARTS AND SCIENCE

DEPARTMENT OF MICROBIOLOGY

DEPARTMENT OF LIFE SCIENCE

SYLLABUS
FOR

Add on Course

Certificate Course in Spirulina Cultivation

Course Co-ordinator

Dr. T. Ushadevi


Head of the Department
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DEPARTMENT OF MICROBIOLOGY
Add on Course
Certificate Course in Spirulina Cultivation
Course code – 19516SPC

Duration : 45 Hrs

Unit – I

Introduction to SCP production – Scope of *Spirulina* production, importance – morphology, taxonomy and habitat of *Spirulina*

Unit II

Biochemical composition of *Spirulina*, including proximate composition – amino acids – unsaturated fatty acids – minerals and vitamins. Human health benefits of *Spirulina*.

Unit - III

Parameters for spirulina production. Natural production – laboratory cultivation – small scale commercial production

Unit IV


Commercial and mass cultivation (tank construction, culture medium, strain selection, scaling up of the process, optimum condition) – importance of light and pH in *Spirulina* cultivation


Unit V

Harvesting *Spirulina* Biomass, drying and packing process. Prospects of *Spirulina* As self-employment.

Reference Books

1. 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.
2. Selvendran D. (2015) Large Scale Algal Biomass (*Spirulina*) Production in India. In: D. Das (Ed.) Algal Biorefinery: An Integrated Approach, Springer.


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SCHOOL OF ARTS & SCIENCE
Department of Chemistry
Board of Studies Meeting

Circular 12-04-2019

The Board of Studies meeting will be on 15-04-2019

at 2.30 pm in the department. Staff members are requested to attend the meeting

HOD
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Department of Chemistry
PRIST Deemed to be University

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DEPARTMENT OF CHEMISTRY

MEETING OF BOARD OF STUDIES IN DEPARTMENT OF CHEMISTRY (10.04.2019)

MINUTES OF THE MEETING

The Meeting of Board of Studies in the department of Chemistry was held on 10.04.2019 at 10.30 am in the seminar hall at PRIST University Vallam Campus under the Chairmanship of Prof.Dr.M.Jerome Rozario.

NAME & DESIGNATION

Dr.Kabilan Professor /Academic Expert

Dr.P.Balamurugan Professor /Academic Expert

Dr. P. Parthiban Professor

Dr. M. Jerome Rozario Professor

Dr. D. Senthilnathan Associate Professor

Dr. J.S. Nirmalram Associate Professor

Dr. R Manikandan Assistant Professor

Dr. D. Chinnaraja Assistant Professor

Dr. M. Surendra Varma Assistant Professor

Dr. A. Jenif D'souza Assistant Professor

Dr. N.V.Prabhu Assistant Professor

Dr. J. Thulasidhasan Assistant Professor

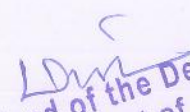
Dr. C.R. Shanthi Assistant Professor


Dr. J.Silabarasan Assistant Professor

Dr.P.Rajamohan Assistant Professor


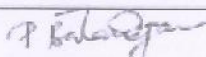


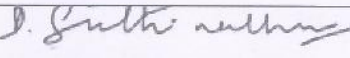
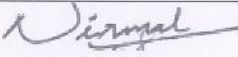
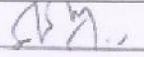
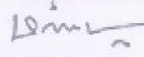

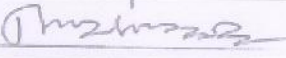
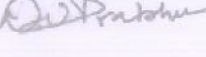

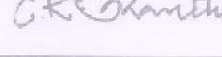
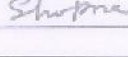

1.Prof. Dr. P. Balamurugan (Industrial Expert)
AGM-Quality Control,
Alembic Pharma,
Gujarath


2. Prof. Dr. S. Kabilan (Academic Expert)
Professor of Chemistry,
Annamalai University, Tamilnadu.



Head of the Department
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Dean of Arts & Science
PRIST Deemed to be University
Thanjavur - 613 403, Tamilnadu.

LIST OF MEMBERS

S.NO	NAME OF THE MEMBERS	DESIGNATION	SIGNATURE
1	Dr.KABILAN	PROFESSOR /ACADAMIC EXPERT	
2	Dr.P.BALAMURUGAN	INDUSTRIAL EXPERT	
3	Dr. P. PARTHIBAN	PROFESSOR	
4	Dr. M. JEROME ROZARIO	PROFESSOR	
5	Dr. D. SENTHILNATHAN	ASSOCIATE PROFESSOR	
6	Dr. J.S. NIRMALRAM	ASSOCIATE PROFESSOR	
7	Dr. R MANIKANDAN	ASSISTANT PROFESSOR	
8	Dr. D. CHINNARAJA	ASSISTANT PROFESSOR	
9	Dr. M. SURENDRA VARMA	ASSISTANT PROFESSOR	
10	Dr. A. JENIF D'SOUZA	ASSISTANT PROFESSOR	
11	Dr. N.V.PRABHU	ASSISTANT PROFESSOR	
12	Dr. J. THULASIDHASAN	ASSISTANT PROFESSOR	
13	Dr. C.R. SHANTHI	ASSISTANT PROFESSOR	
14	Dr. R. SHOPNA	ASSISTANT PROFESSOR	
15	Ms. V.ABARNA	ASSISTANT PROFESSOR	


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DEPARTMENT OF CHEMISTRY

MINUTES OF THE DEPARTMENT ACADEMIC COMMITTEE MEETING

Minutes of the Board of Studies (BoS) meeting held on 15-04-2019 at 10.30 am in PRIST, Vallam, Thanjavur.

Chairperson of the BoS, Department of Chemistry welcomed the members

NAME & DESIGNATION

Dr.Kabilan Professor /Academic Expert

Dr.P.Balamurugan Professor /Academic Expert

Dr. P. Parthiban Professor

Dr. M. Jerome Rozario Professor

Dr. D. Senthilnathan Associate Professor

Dr. J.S. Nirmalram Associate Professor

Dr. R Manikandan Assistant Professor

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Dr. M. Surendra Varma Assistant Professor

Dr. A. Jenif D'souza Assistant Professor


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SCHOOL OF ARTS AND SCIENCE

DEPARTMENT OF CHEMISTRY

We have collected feedback on curriculum from the all the stakeholders for the academic year 2018-2019. We have analysis the feedback and find the issues and suggestion from students, Alumni, Academic Peer, Employer, Parents.

As per investigation of student's feedback, students feel that there is need to add latest chemistry related course in the syllabus.

Alumni feel to introduce new certificate course and diploma course in recent trend chemistry.

Employer suggest that to include new technical relating to the cloud basics

Speculative peer suggested that there is need to include the e-commerce, e-transactions and e-marketing for students' transactions. This will not only enhance the computing skills of students but also lead to better accountability and awareness among parents.

Paternities feel to revise the employability courses on curriculum.

B.Sc Chemistry.

New courses:

Program Exit examination course introduce during VI semester

Electives:

- Middleware Industrial Chemistry II Semester.
- Polymer Chemistry II Semester.

M.Sc Chemistry.

New courses:

- Organic Chemistry-III semester
- Inorganic Chemistry-III semester

Open elective course have to introduce

Electives:

- Medicinal Chemistry course updated during IV Semester.
- Nano chemistry new course updated during IV Semester.

M.Phil. Chemistry

New course- Nil

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Syllabus Revised:

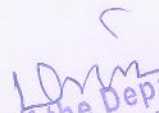
- Research Methodology the entire 5 unit has modified during I Semester


Add on course:

Curriculum and take action for their feedback.

It was decided to observe the intellectual response of the stakeholders in the collected curriculum during the year 2018-2019 and further resolved to change the Syllabus content for B.Sc., Chemistry, Bachelor of Science ,M.Sc., Chemistry.,M.Phil.,in Chemistry with effect from 2019-20 by taking into consideration the stakeholders feedback on curriculum.

DEPARTMENT OF CHEMISTRY


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MEETING OF BOARD OF STUDIES IN DEPARTMENT OF CHEMISTRY (10.04.2019)

MINUTES OF THE MEETING

The Meeting of Board of Studies in the department of Chemistry was held on 10.04.2019 at 10.30 am in the seminar hall at PRIST University Vallam Campus under the Chairmanship of Prof.Dr.M.Jerome Rozario.

NAME & DESIGNATION

Dr.Kabilan Professor /Academic Expert

Dr.P.Balamurugan Professor /Academic Expert

Dr. P. Parthiban Professor

Dr. M. Jerome Rozario Professor

Dr. D. Senthilnathan Associate Professor

Dr. J.S. Nirmalram Associate Professor

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AGM-Quality Control,
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Gujarath

2. Prof. Dr. S. Kabilan (Academic Expert)
Professor of Chemistry,
Annamalai University, Tamilnadu.

Dr. M. Jerome Rozario
Head of the Department
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Dr. M. Jerome Rozario
Dean of Arts & Science
PRIST Deemed to be University
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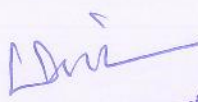
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The chairman of the board of studies welcomed the members. The members of the Board scrutinized the existing syllabi for B.Sc Chemistry & M.Sc Chemistry programme and have unanimously recommended to following suggestion.

- To change the Syllabi for inter-disciplinary course
- To change the Curriculum for value added course
- To classify the courses for B.Sc Chemistry and M.Sc Chemistry programmes as core, elective, foundation courses.
- CIA components- Weekly Test I-20% + Weekly Test II-20% + Pre Semester-20% + MCQ-20 marks + Assignment/Activity-20 marks = 100.

The members of the board also scrutinized and updated the panel of examiners for the B.Sc Chemistry & M.Sc Chemistry submitted the same for the Academic Council for its approval.

The meeting was concluded with thanks from the chairman.


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SCHOOL OF ARTS AND SCIENCE
DEPARTMENT OF CHEMISTRY
B.Sc CHEMISTRY – REGULATION 2019
COURSE STRUCTURE

SEMESTER - I					
COURSE CODE	COURSE TITLE	L	T	P	C
19110AEC11/ 19111AEC11/ 19132AEC11/ 19135AEC11	Tamil – I / Advanced English – I / Hindi – I / French-I	4	0	0	2
19111AEC12	English – I	4	0	0	2
19114AEC13	General Chemistry - I	6	1	0	6
19114AEC14L	Volumetric Analysis Lab	0	0	3	2
19112AEC15A	Calculus and Fourier Series	4	0	0	4
19112AEC16A	Algebra and Trigonometry	4	0	0	4
191_SEC01_	Skill Based Elective - I	0	0	2	1
19111SEC01L	Communicative English Lab – I	0	0	1	1
191INDCONS	Indian Constitution	1	0	0	1
	Total	23	1	6	23
SEMESTER - II					
19110AEC21/ 19111AEC21/ 19131AEC21/ 19135AEC21	Tamil – II / Advanced English – II / Hindi – II / French-II	4	0	0	2
19111AEC22	English – II	4	0	0	2

[Signature]
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[Signature]
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19114AEC23	General Chemistry - II	6	1	0	6
19114AEC24L	Organic Analysis Lab	0	0	3	2
19112AEC25A	ODE,PDE and Laplace Transform	4	0	0	4
19112AEC26A	3D Vector Calculus	4	0	0	4
19114RLC27	Research Led Seminar	-	-	-	1
191_SEC02_	Skill Based Elective - II	0	0	2	1
19111SEC02L	Communicative English Lab-II	0	0	2	1
	Total	22	1	7	23
SEMESTER - III					
19110AEC31/ 19111AEC31/ 19131AEC31/ 19135AEC31	Tamil - III / Advanced English - II I / Hindi - III / French-III	4	0	0	2
19111AEC32	English - III	4	0	0	2
19114AEC33	General Chemistry - III	6	0	0	6
19114AEC34L	Physical Chemistry Lab - I	0	0	3	3
19113AEC35	Physics - I	5	0	0	4
19113AEC36L	Physics Lab - I	0	0	3	2
19114RMC37	Research Methodology	3	0	0	3
191_SEC03_	Skill Based Elective - III	0	0	2	1
19111SEC03L	Communicative English Lab - III	0	0	2	1
	Total	22	0	10	24
SEMESTER - IV					
19110AEC41/ 19111AEC41/ 19131AEC41/ 19135AEC41	Tamil - IV / Advanced English - IV / Hindi - IV / French-IV	4	0	0	2
19111AEC42	English-IV	4	0	0	2

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19114AEC43	General Chemistry - IV	6	01	0	6
19114AEC44L	Physical Chemistry Lab - II	0	0	3	3
19113AEC45	Physics - II	5	0	0	5
19113AEC46L	Physics Lab - II	0	0	3	2
191_SEC04_	Skill Based Elective - IV	0	0	2	1
19111SEC04L	Communicative English Lab -IV	0	0	1	1
191ENVTSTU	Environmental Studies	1	0	0	1
	Total	21	01	9	23
SEMESTER - V					
19114AEC51	Inorganic Chemistry - I	5	0	0	5
19114AEC52	Organic Chemistry - I	5	0	0	5
19114AEC53	Physical Chemistry - I	4	1	0	4
19114AEC54L	Inorganic Qualitative Analysis Lab	0	0	3	3
19114AEC55L	Gravimetric Analysis Lab	0	0	3	3
19114DSC56_	Discipline Specific Elective -I	5	0	0	4
19114BRC57	Participation in Bounded Research	-	-	-	2
191_SEC05_	Skill Based Elective - V	0	0	2	1
19111SEC05L	Communicative English Lab - V	0	0	2	1
	Total	19	1	10	8
SEMESTER - VI					
19114AEC61	Inorganic Chemistry - II	5	1	0	5
19114AEC62	Organic Chemistry - II	5	1	0	5
19114AEC63	Physical chemistry - II	5	1	0	5
19114DSC64_	Discipline Specific Elective - II	5	0	0	4

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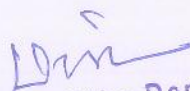
191__OEC65_	Open Elective	4	0	0	2
19114PRW66	Project Work	0	0	0	5
191__SEC06_	Skill Based Elective - VI	0	0	2	1
19111SEC06L	Communicative English Lab-VI	0	0	2	1
19114EXACT_	Extension Activities	0	0	0	1
19114PEE	Programme Exit Examination	0	0	0	2
	Total	23	03	04	31
Total Credits of the Program					152


DISCIPLINE SPECIFIC ELECTIVE COURSES -I

Semester	Elective No.	Course Code	Course Title
V	I	19114DSC56A	a) Pharmaceutical Chemistry
		19114DSC56B	b) Agricultural Chemistry

DISCIPLINE SPECIFIC ELECTIVE COURSES -II

Semester	Elective No.	Course Code	Course Title
VI	II	19114DSC66A	a) Polymer Chemistry
		19114DSC66B	b) Nano Science


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**SCHOOL OF ARTS AND SCIENCE
DEPARTMENT OF CHEMISTRY
M.Sc CHEMISTRY – REGULATION 2019
COURSE STRUCTURE**

SEMESTER - I					
COURSE CODE	COURSE TITLE	L	T	P	C
19214SEC11	Organic Chemistry-I	5	0	0	4
19214SEC12	Inorganic Chemistry-I	5	0	0	4
19214SEC13	Physical Chemistry-I	5	0	0	4
19214SEC14L	Organic Chemistry Lab-I	0	0	5	2
19214SEC15L	Inorganic Chemistry Lab-I	0	0	5	2
19214DSC16_	Discipline Specific Elective-I	5	0	0	4
19214RLC17	Research Led Seminar	-	-	-	1
	Total	20	0	10	21
SEMESTER - II					
19214SEC21	Organic Chemistry-II	4	0	0	4
19214SEC22	Inorganic Chemistry-II	4	0	0	4

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19214SEC23	Physical Chemistry-II	4	0	0	4
19214SEC24L	Organic Chemistry Lab-II	0	0	5	2
19214SEC25L	Inorganic Chemistry Lab-II	0	0	5	2
19214DSC26_	Discipline Specific Elective-II	5	0	0	4
19214RMC27	Research Methodology	3	0	0	2
19214BRC28	Participation in Bounded Research	-	-	-	2
	Total	20	0	10	24
SEMESTER - III					
19214SEC31	Organic Chemistry-III	5	0	0	5
19214SEC32	Inorganic Chemistry-III	5	0	0	5
19214SEC33L	Physical Chemistry Lab-I	-	0	5	3
19214SEC34L	Physical Chemistry Lab-II	-	0	5	3
19214DSC35_	Discipline Specific Elective-III	5	0	0	4
192__OEC36	Open Elective	4	0	0	2
19214SRC37	Participation in Scaffold Research (Design and Societal Project)	-	-	-	2
	Total	19	0	10	24
SEMESTER - IV					
19214SEC41	Physical Chemistry-III	6	1	0	6
19214SEC32	Industrial Chemistry	6	1	0	5
19214DSC43_	Discipline Specific Elective-IV	5	0	0	4
19214PRW44	Project	-	-	-	10

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19214PEE	Programme Exit Examination	-	-	-	2
	Total	17	2	0	27
	Total Credits of this Program				96

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DISCIPLINE SPECIFIC ELECTIVE COURSES -I

Semester	Elective No.	Course Code	Course Title
I	I	19214DSC16A	a) Environmental Chemistry
		19214DSC16B	b) Supramolecular Chemistry

DISCIPLINE SPECIFIC ELECTIVE COURSES -II

Semester	Elective No.	Course Code	Course Title
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II	II	19214DSC26A	a) Special Topics in Chemistry
		19214DSC26B	b) Macromolecules as Engineering Materials.

DISCIPLINE SPECIFIC ELECTIVE COURSES -III

Semester	Elective No.	Course Code	Course Title
III	III	19214DSC35A	a) Medicinal Chemistry
		19214DSC35B	b) Green Organic Synthesis: Principles and Applications

DISCIPLINE SPECIFIC ELECTIVE COURSES -IV

Semester	Elective No.	Course Code	Course Title
IV	IV	19214DSC43A	a) Nano Chemistry
		19214DSC43B	b) Material Chemistry

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COURSE CODE	COURSE TITLE	L	T	P	C
17114DSC66B	Discipline Specific Elective:II Polymer Chemistry	4	0	0	4

COURSE OBJECTIVES:


- To learn the purification techniques of solids and liquids.
- To understand data analysis, various separation techniques.
- To learn gravimetric analysis and various thermo analytical methods.
- To learn visible spectrophotometry and colorimetry.
- To know the various electro analytical techniques.


UNIT – I LABORATORY SAFETY AND PURIFICATION OF CHEMICALS:

- 1.1 Precautions to avoid poisoning-treatment for specific poisons, threshold vapour concentrations-safe limits-laboratory safety measures.
- 1.2 Waste disposal-fume disposal-precautions for avoiding accidents.
- 1.3 Purification of solid organic compounds: recrystallisation, extraction, sublimation.
- 1.4 Purification of liquids: fractional distillation, steam distillation and azeotropic distillation.

UNIT – II DATA ANALYSIS:

- 2.1 The Mean-significant numbers, the median-precision, accuracy- confidence limits, standard deviation.
- 2.2 Errors-method for improving accuracy-rejection of data-presentation of tabulated data-Scatter diagram –method of least squares- S.I. units.
- 2.3 Separation techniques: Precipitation-solvent extraction-chromatography – types, column chromatography-thin layer chromatography.


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2.4 Paper chromatography – paper electrophoresis– ion exchange chromatography –Gas liquid chromatography. UNIT – III GRAVIMETRIC ANALYSIS AND THERMO ANALYTICAL TECHNIQUES:

3.1 Gravimetric analysis - principles-methods of gravimetric analysis - requirement of gravimetric analysis-precipitation-theories of precipitation.

3.2 Types of precipitation – co–precipitation, post precipitation - and precipitation from homogeneous solution-digestion, filtration and washing, drying and ignition. Inorganic and organic precipitating agents.

3.3 Thermo analytical techniques – types-TGA principle-Instrumentation - TGA analysis of $\text{CaC}_2\text{O}_4 \cdot \text{H}_2\text{O}$. Differential thermal analysis-principle-DTA of $\text{CaC}_2\text{O}_4 \cdot \text{H}_2\text{O}$.-factors affecting TGA & DTA.

UNIT – IV VISIBLE SPECTROPHOTOMETRY AND COLORIMETRY:

4.1 Theory of spectrophotometry and colorimetry, Beer-Lambert's law (statement only), Molar absorptivity and absorbance.

4.2 Visual comparators-multiple standard methods, duplication and dilution method, balance method, photoelectric colorimeter, spectrophotometer.

4.3 Criteria for satisfactory colorimetric estimation-advantages of colorimetric estimation, determination of composition of complexes, colorimetric estimation Of iron.

UNIT – V ELECTRO ANALYTICAL METHODS:

5.1 Electro gravimetry –theory - electro gravimetric analysis of Fe and Cu.

5.2 Electrolytic separation of metals: principle –separation of copper and nickel, Electro deposition-principle –overtoltage.

5.3 Coulometry -Principle of coulometric analysis –coulometry at controlled potentialapparatus and technique-separation of nickel and cobalt. Amperometry titrationsprinciple –Instruments –types-applications.

UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment Only):

General quiz on – inter conversion of the units of energy – joules, calories and ergs. Wave properties– wave length, wave number and frequency. Assignment on –electroplating of nickel on steel surface, gravimetric estimation of lactose in milk, preparing rose oil by solvent extraction. Estimation of iron in

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ground water by colorimetric method. Preparing chart for handling and storage of glassware and chemicals in laboratory.

REFERENCES:

1. Gopalan R, Subramanian PS and Rengarajan K (1993) "Elements of analytical chemistry" second revised edition, Sultan Chand.
2. Gurdeep R Chatwal, Sham K. Anand (2005) "Instrumental methods of chemical analysis", Himalaya publishing house.
3. Vogel A.I. Text Book of Quantitative Inorganic analysis," The English Language Book Society, Fourth edition.
4. Douglas A. Skoog, Donald M. West and F. J. Holler, Fundamentals of Analytical chemistry, 7th edition, Harcourt College Publishers.
5. Mendham J., Denny R. C., Barnes J.D., Thomas M., Vogel's Test book of Quantitative Chemical analysis 6th edition, Pearson education.
6. Sharma, B. K., Instrumental methods of chemical analysis, Goel Publishing House, Merrut (1997).
7. <https://www.iitk.ac.in/che/pdf/resources/TGA-DSC-reading-material.pdf>
8. <https://epgp.inflibnet.ac.in/epgpdata/up>

COURSE CODE	COURSE TITLE	L	T	P	C
17114DSC66A	Discipline Specific Elective:II Middleware Industrial Chemistry	4	0	0	4

COURSE OBJECTIVES:

- To know the basic ideas of an industry and industrial wastes.
- To understand the petroleum and petrochemicals.
- To understand the functions of portland cement.
- To study the principles of pulp and paper.
- To know the preparation of soaps, detergents and perfumes.

UNIT – I BASIC IDEAS AND INDUSTRIAL WASTES: Basics idea about unit operation – flow chart – chemical conversion – batch versus continuous processing – chemical process selection – design –

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chemical process control. Types of industrial wastes – treatment of wastes or effluent with organic impurities – treatment of wastes or effluent with inorganic impurities – treatment of some important chemical wastes.

UNIT – II PETROLEUM AND PETROCHEMICALS: Introduction – saturated hydrocarbons from natural gas – uses of saturated hydrocarbons – unsaturated hydrocarbons – acetylene, ethylene, propylene, butylene – aromatic hydrocarbons – toluene and xylene. Preparation of rectified spirit from beat – methylated spirit – preparation of absolute alcohol from rectified spirit – petrochemicals in India.

UNIT – III MANUFACTURE OF CEMENT: Introduction – types of cement – high alumina cement, water proof cement, slag cement, acid resisting cement, white cement, coloured cement, Pozzolana cement. Setting of cement – properties of cement – testing of cement – uses of cement – concrete – cement industries in India.

UNIT – IV PULP AND PAPER AND MANUFACTURE OF PAPER Introduction – manufacture of pulp – types of pulp – sulphate or craft pulp, soda pulp, Rag pulp – beating, refining, filling, sizing and colouring. Calendaring – uses – paper industries in India. 57 UNIT – V SOAPS, DETERGENTS AND PERFUMES: Introduction – types of soaps – hard and soft soaps – manufacture of soap (hot and continuous process only) – cleansing action of soap – detergents – surface active agents – biodegradability of surfactants, amphoteric detergents. Introduction – production of natural perfumes – flower perfumes – jasmine, rose and lily – production of synthetic perfumes – muscone and nitro-musks.

UNIT – VI DYES(For Continuous Internal Assessment Only): Introduction-sensation of colour-colour and constitution-nomenclature-basic operations in dyeing-classification of dyes according to the mode of applicationsynthesis, reaction and applications of diphenyl methane dyes-triphenylmethane dyes-phthalein dyes- xanthene dyes-acridine dyes-Sulphur dyes-cyanine dyes.

REFERENCES:

1. B. K. Sharma, Industrial Chemistry; 8th Ed., Goel Publishing House, New Delhi, 1997. (Unit-I, II, III, IV and V)
2. R. N. Shreve, and J. A. Brink Jr. Chemical Process Industries; 4th Ed., McGraw Hill, Toronto, 1977. (Unit-I, II, III, IV and V)
3. A. C. S. Brain, Production and Properties of Industrial Chemicals; Reinhold, New York, 1989. (Unit-I)

M.Sc Chemistry.

➤ Medicinal Chemistry course updated during IV Semester.

COURSE CODE	COURSE TITLE	L	T	P	C
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19214DSC41A	Discipline Specific Elective - III Medicinal Chemistry	5	1	0	4
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Aim:

- The aim of this course is to provide a core for future studies and aspects of Medicinal Chemistry.

Objective:

- To learn the importance of Medicinal Chemistry.

Outcomes:

- Having successfully completed this module you will be able to:
- Learning various concepts of Drugs.
- Learning various concepts in medicinal Chemistry.

UNIT- I

General Introduction

Introduction to medicinal chemistry, general mechanism of drug action on lipids, carbohydrates, proteins and nucleic acids, drug metabolism and inactivation, receptor structure and sites, drug discovery development, design and delivery systems, gene therapy and drug resistance.

UNIT - II

Drugs

Drugs based on structure or pharmacological basis with examples, synthesis of important drugs such as α - methyl dopa, chloramphenicol, griseofulvin, cephalosporins and nystatin. Molecular modeling, conformational analysis, qualitative and quantitative structure activity relationships.

UNIT - III

Antibiotics

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Mechanism of action of lactam antibiotics and non lactam anti biotics, antiviral agents, chemistry, stereochemistry, biosynthesis and degradation of penicillins - An account of semisynthetic penicillins - acid resistant, penicillinase resistant and broad spectrum semisynthetic penicillins.

UNIT- IV

DNA Interactions

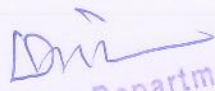
DNA-protein interaction and DNA-drug interaction. Introduction to rational approach to drug design, physical and chemical factors associated with biological activities, mechanism of drug action.


UNIT V

Enzyme Reactions: Nomenclature and classification of enzymes, Fischer's lock and key and Koshland's induced fit hypothesis, concept and identification of active site by the use of inhibitors. Enzyme kinetics, Michaleis-Menten and Lineweaver-Burk plots.

References:

1. G. L. Patrick, Introduction to Medicinal Chemistry, Oxford Univeristy Press, 2001.
2. I. Wilson, Giswald and F. Doerge, Text Book of Organic Medicinal and Pharmaceutical Chemistry, J.B. Lippincott Company, Philadelphia, 1971.
3. A. Burger, Medicinal Chemistry, Wiley Interscience, New York, Vol. I and II, 1970.
4. Bentley and Driver's Text Book of Pharmaceutical Chemistry revised by L.M. Artherden, Oxford University Press, London, 1977.
5. A. Gringauz, Introduction to Medicinal Chemistry, How Drugs Act and Why?, John Wiley and Sons, 1997.


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Chemical spills – Mercury and Biohazardous – clean up procedure - Accident management - Disposal of chemicals and glass wares.

References:

1. C. R. Kothari, Research Methodology, New Age International Publishers. New Delhi, 2004.
2. R.A Day and A.L. Underwood, Quantitative analysis, Prentice Hall, 1999.
3. D.G Peters, J.M. Hayes and G.M. Hefige, A brief introduction to Modern chemical analysis.
4. R. Gopalan, Thesis writing, Vijay Nicole Imprints Private Ltd., 2005.
5. R. Gopalan, P. S. Subramanian and K. Rengarajan, Elements of Analytical Chemistry, Sultan Chand and Sons, New Delhi, 2005.
6. E. Balagurusamy, Numerical methods, Tata McGraw-Hill
7. S.S. Sastry, Introductory Methods of Numerical analysis, PHI, N.Delhi

SEMESTER - III

COURSE CODE	COURSE TITLE	L	T	P	C
19214SEC31	Organic Chemistry - III	5	0	0	4

Aim:

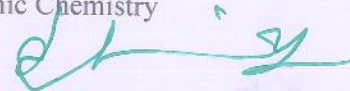
- To acquaint students with learning Organic Chemistry

Objective:

- To sensitize students to learn Important components of Organic Chemistry

Outcome:

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- Having successfully completed this module you will be able to:
- Gaining knowledge organic Synthesis.

Unit I

Reagents in Organic Synthesis:

Use of the following reagents in organic synthesis and functional group transformations, complex metal hydrides, Gilman's reagent, lithium dimethylcuprate, lithium diazopropylamine (LDA), 1,3-dithiane, trimethylsilyl iodide, tri-n-butyltin hydride, Woodward and Prevost hydroxylation, osmium tetroxide, DDQ, selenium dioxide, Peterson's synthesis, Wilkinson's catalyst, baker yeast.

Unit II

Photochemistry:

Cis-trans isomerism, Paterno-Buchi reaction, Norrish type I and II reactions. Photoreduction of ketones, di-pimethane rearrangement, photochemistry of arenes.

Unit III

Pericyclic Reactions:

Selection rules and stereochemistry of electrocyclic reactions, cycloaddition, and sigmatropic shifts, Sommet, Hauser, Cope and Claisen rearrangements.

Unit IV

Selective Organic Name Reactions:

Favorski, Mannich, Stork-Enamine reactions, Sharpless asymmetric epoxidation, Ene reaction, Barton reaction, Hoffmann-Löffler-Freytag reaction, Shapiro, Chichibabin and Bayer-Villiger reactions.

Unit V

Spectroscopy:

Applications of Mass, UV-VIS, IR and NMR spectroscopy for structural elucidation of organic molecules.

References:

- (1) R.K. Bansal, Organic reaction mechanisms, New Age International, 1996.
- (2) F.A. Carey and R.J. Sunberg, Advanced Organic Chemistry.
- (3) W. Carruthers, Some Modern Methods in Organic Synthesis, Cambridge, 1971.
- (4) E.J. Corey, Reactions and Reagents in Organic Synthesis, VCH, 1988.

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- (5) I.L.Finar, Organic Chemistry, Vol. II, ELBS, 1977.
- (6) C. H. Depuy and O.S. Chapman, Elements of Organic Photochemistry, Prentice Hall, 1975.
- (7) D. Dyer, Application of Absorption Spectroscopy of Organic Compounds, Prentice Hall, 1978.

COURSE CODE	COURSE TITLE	L	T	P	C
19214SEC32	Inorganic Chemistry - III	5	0	0	4

Aim:

- To acquaint students with learning Inorganic Chemistry

Objective:

- To learn Important Concepts of Inorganic Chemistry

Outcome:

- Having successfully completed this module you will be able to:

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- .Recognise Analytical Techniques and Spectroscopy.

UNIT – I

Topics in Analytical Chemistry:

Adsorption partition, exclusion electrochromatography, solvent extraction and ion exchange methods. Application of atomic and molecular absorption and emission spectroscopy in quantitative analysis. Light scattering techniques including nephelometry. Raman Spectroscopy: Electroanalytical techniques; voltammetry, cyclic voltammetry, polarography, amperometry coulometry and conductometry. Ion-selective electrodes, anodic stripping voltammetry, TGA, DTA, DSC and online analyzer.

UNIT –II

Electronic Spectroscopy:

Electronic configuration, terms states and microstates, derivation of term symbols (p^2 , d^2) and arranging the various terms according to their energies. Spectroscopic terms – effect of inter electronic repulsion and spin – orbit coupling – Racah parameters B and C- R-S coupling and JJ coupling. Selection rules and the breakdown of selection rules- group theoretical explanation. Ground states of free ions for d^n systems- Oh and T_d systems and the corresponding energy level diagrams- mixing of orbitals. Orgel diagram – characteristics – prediction and assignment of transitions for d^n weak field cases. Tanabe-Sugano diagrams- characteristics – prediction and assignment of transition for weak field and strong field – d^n systems band intensity, band widths – band shapes – factors affecting these – distortion and spin-orbit coupling calculation of B and $10q$ for simple octahedral complexes of Co and Ni.

UNIT –III

IR and Raman Spectroscopy:

Combined uses of IR and Raman spectroscopy in the structural elucidation of simple molecules like H_2O , ClF_3 , NO_3 , ClO_3 . Effect of co-ordination on ligand vibrations – uses of group vibrations in the structural elucidation of metal complexes of urea, thiourea, cyanide, thiocyanate nitrate, sulphate and dimethylsulphoxide. Effect of isotopic substitution on the vibrational spectra of molecules – vibrational spectra of metal carbonyls with reference to the nature of bonding, geometry and number of C-O stretching vibrations (group theoretical treatment).

UNIT – IV

NMR Spectroscopy:

Chemical shifts and coupling constants (spin-spin coupling involving different nuclei 1H , ^{31}P & ^{13}C) interpretation and applications to inorganic compounds. Effects of

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Quadrupole nuclei (^1H , ^{10}B , ^{11}B) on the ^1H NMR spectrum. NMR paramagnetic molecules - isotopic shifts, contact and pseudocontact interactions- lanthanide shift reagents. Stereochemistry of non-rigid molecules, satellite spectra – Applications of ^{31}P , ^{13}C and ^1H NMR of inorganic molecules.

UNIT – V

EPR Spectroscopy:

Basic principles – characteristics of ‘g’ – hyperfine splitting - selection rules- hyperfine splitting on various structure – bis (salicyldiaminecopper(II) – factors affecting the magnitude of the ‘g’ values of transition metal ions – dependence on spin – orbit coupling crystal field. Three conditions (i) spin-orbit coupling crystal field (ii) strength of the crystal field effects, (iii) very large crystal field. Ni(II) octahedral complex- Cu^{2+} in a tetragonal – field. Zero-field splitting and signal- effecting spins mixing of saturated zero field splitting. Line widths in solid state EPR – spin – lattice – spin – spin relaxation – exchange processes. Effect of distortion – T, Ag, Eg. ground terms – g (parallel), g (perpendicular), g (average) $\alpha^2\beta^2$ and G parameters from EPR and information obtained from them.

References:

1. A.I. Vogel, Quantitative Inorganic Analysis, 3rd Ed., ELBS Longman, London.
2. R.S. Drago, Physical Methods in Inorganic Chemistry, 3rd ed., Wiley Eastern Company.
3. R.S. Drago, Physical Methods in Chemistry, W.B. Saunders Company, Philadelphia, London.
4. P.J. Wheatley, The Determination of Molecular Structure.
5. E.A.V. Ebsworth, Structural Methods in Inorganic Chemistry, 3rd Ed., ELBS, Great Britain, 1987.
6. C.N. Banwell, Fundamentals of Molecular Spectroscopy, 3rd Ed., Mc-Graw Hill, 1983, New Delhi.
7. G.H.H. Stout and L.H. Jenson, X-ray Structure Determination, a Practical Guide.
8. G. Barrow, Introduction to Molecular Spectroscopy, Mc-Graw Hill, New York, 1964
9. P.K. Ghosh, Introduction to Photoelectron Spectroscopy, John Wiley, New York (1989).
10. W.Kemp, NMR in Chemistry – A Multinuclear Introduction, McMillan, 1986.

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11. C.D. Becker, High Resolution NMR – Theory and Applications, Academic Press, 2nd Ed., 1980.

COURSE CODE	COURSE TITLE	L	T	P	C
19214SEC34L	Physical Chemistry Lab -I	0	0	5	3

Aims: The physical laboratory class consists of a series of experiments designed to be completed in either one or two sessions. The laboratory is designed to illustrate and reinforce concepts covered in the lecture based part of the course. The students will be introduced to a number of spectroscopic and analytical techniques.

Objectives: To perform eight experiments covering analytical chemistry, catalysis, diffraction, IR spectroscopy, kinetics and thermodynamics

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DEPARTMENT OF CHEMISTRY

VALUE ADDED COURSE

Academic year: 2019-2020

Certificate Course on Nano-materials and Nano-Technology.

Aim:

To introduce students to Nano-materials and Nano-Technology techniques.

Objectives:

- To inculcate concepts of Nano-materials and Nano-Technology identification and validation.
- To understand techniques in Phenotypic deconvolution.
- To increase employability of the students.

Course Outcomes:

At the end of this unit, you will be able to:

- Choose the Nano-materials and Nano-Technology.
- Understand the different types of packing in Nano-materials and Nano-Technology

UNIT-1

Milestones in nanotechnology, Recapitulation of concepts of quantum mechanics and solid states of materials, Synthesis of nanomaterials by Physical methods High energy Ball milling, melt mixing, glass matrix method, Evaporation method, vapour deposition method, ionized cluster beam deposition, laser method, Laser pyrolysis, sputter deposition DC, RF, magnetron sputtering, plasma eposition Chemical vapour deposition, electric arc deposition, ion beam technique, molecular beam epitaxy Synthesis of Nanomaterials by Chemical methods

UNIT-2

Advantages of chemical synthesis, synthesis of colloids, nucleation and growth of nano particles, Synthesis of metal nano particles by colloidal route, synthesis of semi conductor nano particles, Chemical capping of nanoparticles, Langmuir Blodgett method, microemulsions Sol Gel method, Hydro thermal synthesis, sono chemical synthesis, microwave synthesis, synthesis using micro reactor Synthesis of nano particles by biological method

UNIT-3

[Signature]
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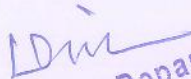
synthesis using micro organism, from plant extract, from proteins, template like DNA, Self assembly of nano materials in organic, inorganic and biological systems, Introduction to special nano materials carbon nano materials, types of carbon nano tubes, porous materials, porous aerosols, porous silicon.


UNIT-4

Characterisation, Properties Applications Characterisation Properties of nano materials Optical properties Photo luminescence, electroluminescence, cathodoluminescence, thermoluminescence

UNIT-5

Mechanical properties, structural properties, melting of nano particles, and dielectric properties Characterisation of nano particles x ray diffraction, SEM, energy dispersive x ray spectroscopy, TEM, uv vis spectroscopy and NMR Applications Energy source Solar photo voltaic cell, dye sensitized and organic, Fuel cells, hybrid energy cells In medical field Imaging, drug delivery, cancer therapy, tissue regeneration Automobiles, sports, textiles, cosmetics, agriculture, domestic applications Effect of nano technology on human life and environment.


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DEPARTMENT OF CHEMISTRY

VALUE ADDED COURSE

Academic year: 2019-2020

Diploma Course on Thin layer and column Chromatographic techniques.

Aim:

To introduce students to thin layer and column Chromatographic techniques.

Objectives:

- To inculcate concepts of thin layer and column identification and validation.
- To understand techniques in Phenotypic screening and target deconvolution.
- To increase employability of the students.

To educate about role of thin layer and column Chromatographic techniques of novel biologically active compounds

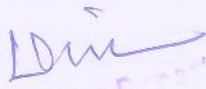
Course Outcomes:


At the end of this unit, you will be able to:

- Choose the suitable solvent for chromatographic techniques.
- Understand the different types of column packing in column chromatography
- Apply paper chromatography for the separation of compounds

Investigate the mixture of compounds by column chromatography
Categorize the metallic ions by column chromatography

UNIT-I: Thin Layer Chromatography


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Thin Layer Chromatography-Principle, techniques of thin layer chromatography-preparation of chromatoplates, application of sample on the chromatoplates, Choice of adsorbents, selection of solvents, locating the reagents, developing chamber, development, types, location of compounds. R_f value, factors affecting R_f value, detection, estimation and identification.

UNIT-II: Column Chromatography

- Column chromatography-principle, types-adsorption, partition and ion-exchange
- Experimental Techniques-adsorption column-packing of column-wet and dry, factors affecting column efficiency.
- Adsorbents, solvents, developers, identification of compounds.

UNIT-III: Thin Layer Chromatography-Practical

- Preparation of TLC plates
- Separation of commercial inks
- Separation of dyes- malachite green, fluorescein, rhodamin-B

UNIT-IV: Column Chromatography-Practical –I

- Separation of methylene blue and malachite green dyes on alumina.
- Separation of black ink and red ink

UNIT-V: Column Chromatography-Practical –II

Separation of ferric alum and copper sulphate on alumina

Text Books:

V.K.Srivastava, K. Kishore Introduction to Chromatography: Theory and Practice 3RD S. Chand, New Delhi 1987 I-V

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SCHOOL OF ARTS AND SCIENCE
DEPARTMENT OF CHEMISTRY

Branch name	Year	Course offered
194141S	III BSc	INDUSTRIAL SAFETY

OBJECTIVES:

- To provide exposure to the students about safety and health provisions related to hazardous processes as laid out in Factories act 1948.
- To familiarize students with powers of inspectorate of factories.
- To help students to learn about Environment act 1986 and rules framed under the act.
- To provide wide exposure to the students about various legislations applicable to an industrial unit.

UNIT I FACTORIES ACT – 1948

Statutory authorities – inspecting staff, health, safety, provisions relating to hazardous processes, welfare, working hours, employment of young persons – special provisions – penalties and procedures-Tamilnadu Factories Rules 1950 under Safety and health chapters of Factories Act 1948. Forms, Registers and notices – Tamilnadu Safety Officer Rules 2005- with updated Amendments.

UNIT II ENVIRONMENT ACT – 1986

General powers of the central government, prevention, control and abatement of environmental pollution-Biomedical waste (Management and handling Rules, 1989-The noise pollution (Regulation and control) Rules, 2000-The Batteries (Management and Handling Rules) 2001- No Objection certificate from statutory authorities like pollution control board.


Air Act 1981 and Water Act 1974: Central and state boards for the prevention and control of air pollution-powers and functions of boards – prevention and control of air pollution and water pollution – fund – accounts and audit, penalties and procedures.UNIT III MANUFACTURE, STORAGE AND IMPORT OF HAZARDOUS CHEMICAL RULES 1989 AND MAJOR ACCIDENT HAZARD CONTROL RULES AND AMENDMENT

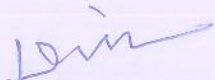
Definitions – duties of authorities – responsibilities of occupier – notification of major accidents – information to be furnished – preparation of offsite and onsite plans – list of hazardous and toxic chemicals – safety reports – safety data sheets. Major Accident Hazard Control Rules. Hazardous Wastes (management, handling and Transboundary Movement) Rules 2016.


UNIT IV OTHER RULES

ACTS

AND

Indian Boiler (Amendments) Act 2007, static and mobile pressure vessel rules (SMPV), motor vehicle rules, The Mines and Minerals (Development & Regulation) Amendment Act, 2015, workman compensation act, rules – electricity act and rules – hazardous wastes (management, handling and transboundary) rules, 2008 - the building and other construction workers act 1996, 


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SCHOOL OF ARTS AND SCIENCE
DEPARTMENT OF CHEMISTRY

Petroleum rules, Gas cylinder rules 2016, Explosives Act 1884 - Pesticides Act - E waste (management) rules 2016.

UNIT V INTERNATIONAL ACTS AND STANDARDS
Occupational Safety and Health act of USA (The Williames - Steiger Act of 1970) – Health and safety work act (HASAWA 1974, UK) – ISO 14001 – ISO 45001 , European Safety and Health Legislations, American Petroleum Institute (API) Standards, Oil Industry Safety Directorate (OISD) Standards, National Fire Protection Association (NFPA) Standards, Atomic Energy Regulatory Board (AERB), American National Standards Institute(ANSI).

The students will be able

- To list out important legislations related to health, Safety and Environment.
- To list out requirements mentioned in factories act for the prevention of accidents.
- To understand the health and welfare provisions given in factories act.
- To understand the statutory requirements for an Industry on registration, license and its renewal.
- To prepare onsite and offsite emergency plan.

REFERENCES:

1. The Factories Act 1948, Madras Book Agency, Chennai, 2000
2. The Environment Act (Protection) 1986, Commercial Law Publishers (India) Pvt.Ltd., New Delhi.
3. Water (Prevention and control of pollution) act 1974, Commercial Law publishers (India) Pvt.Ltd.,New Delhi.
4. Air (Prevention and control of pollution) act 1981, Commercial Law Publishers (India) Pvt.Ltd., New Delhi.
5. The Indian boilers act 1923, Commercial Law Publishers (India) Pvt.Ltd., Allahabad.
6. The Mines Act 1952, Commercial Law Publishers (India) Pvt.Ltd., Allahabad.
7. The manufacture, storage and import of hazardous chemical rules 1989, Madras Book Agency, Chennai.
8. Srinivasan S, "The Tamil Nadu Safety Officers Rules 2005" Madras Book

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
MEETING OF BOARD OF STUDIES IN COMPUTER SCIENCE AND ENGINEERING

MINUTES OF THE MEETING

The Meeting of Board of Studies in the Department of Computer science and Engineering was held on 24.04.2019 at 11.30 am in the Dean Chamber at PRIST University, Vallam Campus under the Chairmanship of Prof. Dr. R. Latha .

The following members attended the meeting:

S.No.	Name of the Member	Position	Role
1.	Dr.R.Latha	HOD/CSE	Chair Person
2.	Dr.N.Gopalan	Professor,Department of CA,NIT Trichy	External Member
3.	Dr.R.Selvaraj	Senior ManagerBC andBS Material Management,BHEL,Trichy.	External Member
4.	Dr.L.S. Usharani	Professor	Internal Member
5.	Dr.S.Nithyanandam	Professor	Internal Member
6.	Dr.A.N.Arularasan	Associate Professor	Internal Member
7.	Dr.K.Padmapriya	Associate Professor	Internal Member
8.	S.Jancy Sickory Daisy	Assistant Professor	Internal Member
9.	K.Jayanthi	Assistant Professor	Internal Member
10.	Prof.R.Tamizhselvan	Dean	Internal Member
11.	B.Rajesh Kumar	Infotech Solution	Internal Member
12.	T.Praveenraj	Iv year student	Internal Member

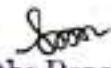

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At the outset, the Chairman BOS welcomed the members for attending the meeting of the Board of Studies. In her introductory remarks, she described the agenda items

- The members of the Board thoroughly scrutinized the existing curriculum and syllabi for B.TECH -CSE (Full Time), M.TECH - CSE (Full Time), B.TECH - CSE (Part Time), M.TECH-CSE (Part Time) and feedbacks or curriculum obtained from various stakeholders and it is resolved to consider the feedbacks during forth coming syllabus revision.
- In the current regulation the courses have been classified as core course, elective course, foundation course and non-CGPA courses.
- The members of the board also scrutinized and updated the panel of examiners and recommended to continue with existing panel of examiners for the B.TECH -CSE (FT) & M.TECH - CSE (FT), B.TECH - CSE (PT), M.TECH - CSE (PT) and submitted the same for the Academic Council for its approval.
- Also the members of the board have unanimously recommended continuing with the existing curriculum of Regulation 2017 with addition of new electives which is to be followed in the academic year 2019 - 20 for M.Tech CSE (Full Time), M. Tech CSE (Part Time).
 - The List of suggested subjects are:

S. No	Name of the programme	Course Code	Name of the Course
1	M.Tech(FT) CSE	19250E16B	Internet of Things
2	M.Tech(FT) CSE	19250E24C	Machine Learning Techniques
3	M.Tech(FT) CSE	19250E25C	Big Data Analytics
4	M.Tech(FT) CSE	19250E32B	Information Retrieval
5	M.Tech(FT) CSE	19250E33C	Natural Language Processing
6	M.Tech(FT) CSE	19250E34C	Speech Processing


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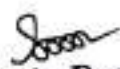

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- List of M.Tech part time elective courses

19150E44BP	Data Warehousing and Mining
19150E54AP	Cloud Computing
19160E64AP	Social Network Analysis
19150E74BP	Internet of Things


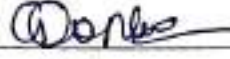

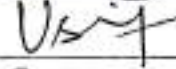

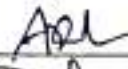
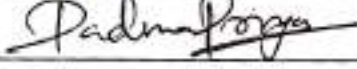
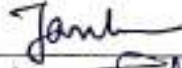


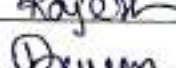

- Apart from Curriculum courses the Board members discussed with the feedback taken from various stake holders with respect of increasing the skill and potential of students. Finally came out with suggesting 3 new courses have introduced Value added courses for the benefit of students.


- Mobile App Development Using Android Studio
 - Developing Apps With Google Cloud Platform
 - Web Programming
- The Meeting was Concluded with thanks from the chairperson


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SIGNATURE OF MEMBERS

S.No.	Name of the Member	SIGN
1.	Dr.R.Latha	
2.	Dr.N.Gopalan	
3.	Dr.R.Selvaraj	
4.	Dr.L.S. Usharani	
5.	Dr.S.Nithyanandam	
6.	Dr.A.N.Arularasan	
7.	Dr.K.Padmapriya	
8.	S.Jancy Sickory Daisy	
9.	K.Jayanthi	
10.	Prof.R.Tamizhselvan	
11.	B.Rajesh Kumar	
12.	T.Praveenraj	


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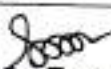

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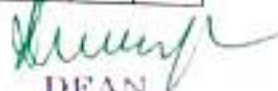
SEMESTER III

Sl. No	COURSE CODE	COURSE TITLE	L	T	P	C
THEORY						
1.	19148S31A	Discrete Mathematics	4	0	0	4
2.	19150S32	Digital Principles and System Design	4	0	0	4
3.	19150C33	Data Structures	3	0	0	3
4.	19150C34	Object Oriented Programming	3	0	0	3
5.	19150S35	Communication Engineering	3	0	0	3
PRACTICAL						
6.	19150L36	Data Structures Laboratory	0	0	4	2
7.	19150L37	Object Oriented Programming Laboratory	0	0	4	2
8.	19150L38	Digital Systems Laboratory	0	0	4	2
9.	19150L39	Interpersonal Skills/Listening & Speaking	0	0	2	1
TOTAL			17	0	14	24

SEMESTER IV

Sl. No	COURSE CODE	COURSE TITLE	L	T	P	C
THEORY						
1	19148S41A	Probability and Queuing Theory	4	0	0	4
2	19150C42	Computer Architecture	3	0	0	3
3	19150C43	Database Management Systems	3	0	0	3
4	19150C44	Design and Analysis of Algorithms	3	0	0	3
5	19150C45	Operating Systems	3	0	0	3
6	19150C46	Software Engineering	3	0	0	3
PRACTICAL						
7	19150L47	Database Management Systems Laboratory	0	0	4	2
8	19150L48	Operating Systems Laboratory	0	0	4	2
9	19150L49	Advanced Reading and Writing	0	0	2	1
Research Skill Based (RSB) Course						
10	19150CRS	Research Led Seminar				1
TOTAL			19	0	10	25


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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

PROGRAM HANDBOOK

M.Tech

COMPUTER SCIENCE AND ENGINEERING
[FULL TIME]

[REGULATION 2019]

[For candidates admitted to M.Tech CSE program from June 2017 onwards]

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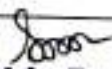
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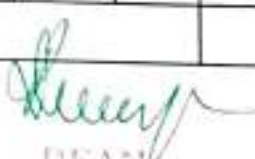
SEMESTER - I

Semester. no	Subject Code	Subject Title	Periods per Week			C
			L	T	P	
I	19248S11A	Higher Mathematics	3	1	0	4
I	19250C12	Modern Operating System	4	0	0	4
I	19250C13	Parallel and High Performance Computing	4	0	0	4
I	19250C14	Adhoc and Sensor Network	4	0	0	4
I	19250C15	Advanced Data Structures and Algorithms	4	1	0	4
I	19250E16_	Elective - I	3	0	0	3
Practical						
I	19250L17	Advanced Web Technologies Lab	0	0	3	3
Research Skill Development(RSD) Courses						
I	19250CRS	Research Led Seminar	0	0	0	1
Total no of Credit						27

SEMESTER - II

Semester. no	Subject Code	Subject Title	Periods per Week			C
			L	T	P	
II	19250C21	Middleware Technologies	3	1	0	4
II	19250C22	Object Oriented Software Engineering	4	0	0	4
II	19250C23	Digital Image Processing	4	0	0	4
II	19250E24_	Elective II	3	0	0	3
II	19250E25_	Elective - III	3	0	0	3
Practical						
II	19250L26	.NET Technologies Lab	0	0	3	3
II	192TECWR	Technical Writing /Seminars	0	0	3	3
Research Skill Development(RSD) Courses						
II	19250CRM	Research Methodology	3	0	0	3
II	19250CBR	Participation in Bounded Research	2	0	0	2
Total no of Credit						29


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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	19250E16A	Multimedia Systems	3	0	0	3
I	19250E16B	Internet of Things	3	0	0	3
I	19250E16C	Software Metrics	3	0	0	3

SEMESTER - II - ELECTIVE – II

Semester no	Subject Code	Subject Title	Periods per Week			C
			L	T	P	
II	19250E24A	Advanced Distributed Computing	3	0	0	3
II	19250E24B	Data Warehousing & Data Mining	3	0	0	3
II	19250E24C	Machine Learning Techniques	3	0	0	3

SEMESTER - II - ELECTIVE – III

Semester no	Subject Code	Subject Title	Periods per Week			C
			L	T	P	
II	19250E25A	Service Oriented Architecture	3	0	0	3
II	19250E25B	High Speed Networks	3	0	0	3
II	19250E25C	Big Data Analytics	3	0	0	3

SEMESTER - III - ELECTIVE – IV

Semester no	Subject Code	Subject Title	Periods per Week			C
			L	T	P	
III	19250E32A	Cloud Computing	3	0	0	3
III	19250E32B	Information Retrieval	3	0	0	3
III	19250E32C	Soft Computing	3	0	0	3

SEMESTER - III - ELECTIVE – V

Semester no	Subject Code	Subject Title	Periods per Week			C
			L	T	P	
III	19250E33A	Advanced Database Technology	3	0	0	3
III	19250E33B	Mobile Communication and Computing	3	0	0	3
III	19250E33C	Natural Language Processing	3	0	0	3

SEMESTER - III - ELECTIVE – VI

Semester no	Subject Code	Subject Title	Periods per Week			C
			L	T	P	
III	19250E34A	Software Quality Assurance	3	0	0	3
III	19250E34B	Bio-Informatics	3	0	0	3
III	19250E34C	Speech Processing	3	0	0	3

SEMESTER - III - ELECTIVE - IV

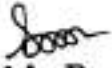
Semester no	Subject Code	Subject Title	Periods per Week			C
			L	T	P	
III	19250E32A	Cloud Computing	3	0	0	3
III	19250E32B	Information Security	3	0	0	3
III	19250E32C	Soft Computing	3	0	0	3


SEMESTER - III - ELECTIVE - V

Semester no	Subject Code	Subject Title	Periods per Week			C
			L	T	P	
III	19250E33A	Advanced Database Technology	3	0	0	3
III	19250E33B	Mobile Communication and Computing	3	0	0	3
III	19250E33C	Green Computing	3	0	0	3

SEMESTER - III - ELECTIVE - VI

Semester no	Subject Code	Subject Title	Periods per Week			C
			L	T	P	
III	19250E34A	Software Quality Assurance	3	0	0	3
III	19250E34B	Bio-Informatics	3	0	0	3
III	19250E34C	Wireless Application Protocols	3	0	0	3


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 23 of the 10/1/2007
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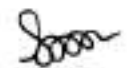

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CREDITS DISTRIBUTION

Semester	Core Theory Courses		Elective Courses		Practical Courses		Courses on *RSD		Project		Total Credits
	Nos.	Credits	Nos.	Credits	Nos.	Credits	Nos.	Credits	Nos.	Credits	
I	05	20	01	03	01	03	01	01	-	-	27
II	03	12	02	06	02	06	02	05	-	-	29
III	01	04	03	09	-	-	01	06	01	10	29
IV	-	-	-	-	-	-	-	-	01	15	15
Total Credits											100

*RSD-Research Skill Development

TOTALCREDITS	
Semester – I	27
Semester – II	29
Semester – III	29
Semester – IV	15
TOTAL	100


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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

PROGRAM HANDBOOK

M.Tech

COMPUTER SCIENCE AND ENGINEERING
[PART TIME]

[REGULATION 2019]

[For candidates admitted to M.Tech CSE program from June 2017 onwards]


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B.TECH CSE (PT) R-19

SEMESTER I

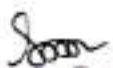
Subject Code	Subject Name	Periods Per Week			C
		L	T	P	
19148S11P	Transforms and Partial Differential Equations	3	1	0	4
19150C12P	Digital Systems	3	0	0	3
19150C13P	Data Structures and algorithms	3	1	0	4
19150C14P	Computer Architecture and Organization	3	1	0	4
19150C15P	Object Oriented Programming	3	1	0	4
Total No. of credits					19


SEMESTER II

Subject Code	Subject Name	Periods Per Week			C
		L	T	P	
19148S21P	Numerical Methods	3	1	0	4
19150C22P	Microprocessors and Interfacing	3	0	0	3
19150C23P	Database Management Systems	3	1	0	4
19150C24P	Design and Analysis Of Algorithm	3	1	0	4
19150C25P	Software Engineering	3	1	0	4
Total No. of credits					19

SEMESTER III

Subject Code	Subject Name	Periods Per Week			C
		L	T	P	
19148S31P	Discrete Mathematics	3	1	0	4
19150C32P	Operating System	4	0	0	4
19150C33P	Artificial Intelligence	4	0	0	4
19150C34P	Computer Networks	4	0	0	4
19150L35P	Operating Systems and Networking Lab	0	0	3	2
Total No. of credits					18


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SEMESTER IV

Subject Code	Subject Name	Periods Per Week			C
		L	T	P	
19150C41P	Principles Of Cryptography	3	1	0	4
19150C42P	Web Technology	3	1	0	4
19150C43P	C# And .Net Framework	3	1	0	4
19150E44_P	Elective-I	3	1	0	4
19150L45P	Internet Programming Lab	0	0	3	2
Total No. of credits					18

SEMESTER - V

Subject Code	Subject Name	Periods Per Week			C
		L	T	P	
19150C51P	Object Oriented Analysis and Design	4	0	0	4
19150C52P	Software Quality Management	3	1	0	4
19150C53P	Graphics and Multimedia	3	1	0	4
19150E54_P	Elective -II	3	1	0	4
19150L55P	Software Development Lab	0	0	3	2
Total No. of credits					18

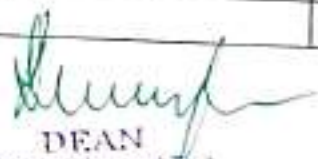
SEMESTER - VI

Subject Code	Subject Name	Periods Per Week			C
		L	T	P	
19150C61P	Embedded Systems	4	0	0	4
19150C62P	Advanced Java programming	3	1	0	4
19150C63P	Software Testing	4	0	0	4
19150E64_P	Elective III	4	0	0	4
19150L65P	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	
19160S71P	Total Quality Management	3	0	0	3
19150C72P	Grid Computing	4	0	0	4
19150C73P	Middleware Technologies	3	1	0	4
19150E74_P	Elective IV	3	0	0	3
19150P75P	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	
19150E44AP	Theory of Computation	3	1	0	4
19150E44BP	Data Warehousing and Mining	3	1	0	4
19150E44CP	User Interface Design	3	1	0	4
19150E44DP	Advanced Databases	3	1	0	4

SEMESTER - V(ELECTIVE II)


Subject Code	Subject Name	Periods Per Week			C
		L	T	P	
19150E54AP	Cloud Computing	3	1	0	4
19150E54BP	Principles of Compiler Design	3	1	0	4
19150E54CP	Distributed Systems	3	1	0	4
19150E54DP	Mobile Computing	3	1	0	4

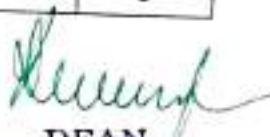
SEMESTER – VI(ELECTIVE III)

Subject Code	Subject Name	Periods Per Week			C
		L	T	P	
19150E64AP	Social Network Analysis	4	0	0	4
19150E64BP	Unix Internals	4	0	0	4
19150E64CP	Parallel Computing	4	0	0	4
19150E64DP	Programming paradigms	4	0	0	4

SEMESTER – VII (ELECTIVE VI)

Subject Code	Subject Name	Periods Per Week			C
		L	T	P	
19150E74AP	High Speed Networks	3	0	0	3
19150E74BP	Internet of Things	3	0	0	3
19150E74CP	Software Project Management	3	0	0	3
19150E74DP	Digital Image Processing	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 - VI	20
TOTAL CREDITS	130


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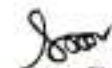



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SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF
COMPUTER SCIENCE AND ENGINEERING

PROGRAM HANDBOOK
B.TECH - FULL TIME
[REGULATION 2019]


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I - VII SEMESTERS CURRICULUM AND SYLLABI

B.TECH (FT) CSE [REGULATION 2019]

SEMESTER I

Sl. No	COURSE CODE	COURSE TITLE	L	T	P	C
THEORY						
1.	19147S11	Communicative English	4	0	0	4
2.	19148S12	Engineering Mathematics I	4	0	0	4
3.	19149S13	Engineering Physics	3	0	0	3
4.	19149S14	Engineering Chemistry	3	0	0	3
5.	19154S15	Engineering Graphics	2	0	4	4
6.	19150S16	Problem Solving and Python Programming	3	0	0	3
PRACTICAL						
7.	19150L17	Problem Solving and Python Programming Lab	0	0	4	2
8.	19149L18	Physics and Chemistry Laboratory	0	0	4	2
9.	191VEA19	Value Education				-
SEMESTER I			0	0	12	25

Semester -II

Sl.	COURSE	COURSE TITLE	L	T	P	C
THEORY						
1	19147S21	Technical English	4	0	0	4
2	19148S22	Engineering Mathematics – II	4	0	0	4
3	19149S23A	Physics for Information Science	3	0	0	3
4	19149S24A	Environmental Science And Engineering	3	0	0	3
5	19153S25A	Basic Electrical, Electronics And measurement Engineering	3	0	0	3
6	19150S26A	Programming in C	3	2	0	4
PRACTICAL						
7	19154L27	Engineering Practices Lab	0	0	4	2
8	19150L28A	C Programming Lab	0	0	4	2
9	191ICA29	Fundamentals of Indian constitution and Economy				-
TOTAL			20	2	8	25

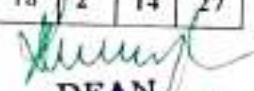
SEMESTER V

Sl. No	COURSE CODE	COURSE TITLE	L	T	P	C
THEORY						
1	19148S51A	Algebra and Number Theory	4	0	0	4
2	19150C52	Computer Networks	3	0	0	3
3	19150C53	Microprocessors and Microcontrollers	3	0	0	3
4	191__OE54__	Open Elective - I	3	0	0	3
5	19150C55	Theory of Computation	3	0	0	3
6	19150C56	Object Oriented Analysis and Design	3	0	0	3
PRACTICAL						
7	19150L57	Microprocessors and Microcontrollers Laboratory	0	0	4	2
8	19150L58	Object Oriented Analysis and Design Laboratory	0	0	4	2
9	19150L59	Networks Laboratory	0	0	4	2
Research Skill Based (RSB) Course						
10	19150CRM	Research Methodology	3	0	0	3
TOTAL			22	0	12	28

SEMESTER VI

Sl. No	COURSE CODE	COURSE TITLE	L	T	P	C
THEORY						
1	19150C61	Internet Programming	3	0	0	3
2	19150C62	Artificial Intelligence	3	0	0	3
3	19150C63	Mobile Computing	3	0	0	3
4	19150C64	Compiler Design	3	2	0	4
5	19150C65	Distributed Systems	3	0	0	3
6	19150E66	Elective - I	3	0	0	3
PRACTICAL						
7	19150L61	Internet Programming Laboratory	0	0	4	2
8	19150L62	Mobile Application Development Laboratory	0	0	4	2
9	19150L63	Mini Project	0	0	4	2
10	19150L64	Professional Communication	0	0	2	1
Research Skill Based (RSB) Course						
11	19150CBR	Participation in Bounded Research				1
TOTAL			18	2	14	27

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SEMESTER VII

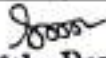
Sl. No	COURSE CODE	COURSE TITLE	L	T	P	C
THEORY						
1	19150S71	Principles of Management	3	0	0	3
2	19150C72	Cryptography and Network Security	3	0	0	3
3	19150C73	Cloud Computing	3	0	0	3
4	191__OE74__	Open Elective - II	3	0	0	3
5	19150E75__	Elective - II	3	0	0	3
6	19150E76__	Elective - III	3	0	0	3
PRACTICAL						
7	19150L77	Cloud Computing Laboratory	0	0	4	2
8	19150L78	Security Laboratory	0	0	4	2
Research Skill Based (RSB) Course						
9	19150CSR	Design / Socio-Technical Project				3
TOTAL			18	0	8	25

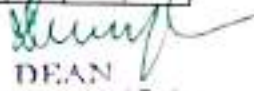
SEMESTER VIII

Sl. No	COURSE CODE	COURSE TITLE	L	T	P	C
THEORY						
1	19150E81__	Elective - IV	3	0	0	3
2	19150E82__	Elective - V	3	0	0	3
PRACTICAL						
3	19150P83	Project Work	0	0	20	10
4	19150PEE	Program Exit Examination				2
TOTAL			6	0	20	18

ELECTIVE I (SEMESTER VI)

Sl. No	COURSE CODE	COURSE TITLE	L	T	P	C
THEORY						
1	19150E66A	Data Warehousing and Data Mining	3	0	0	3
2	19150E66B	Software Testing	3	0	0	3
3	19150E66C	Embedded Systems	3	0	0	3
4	19150E66D	Graph Theory and Applications	3	0	0	3
5	19150E66E	Digital Signal Processing	3	0	0	3


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ELECTIVE II (SEMESTER VII)

Sl. No	COURSE CODE	COURSE TITLE	L	T	P	C
THEORY						
1	19150E75A	Big Data Analytics	3	0	0	3
2	19150E75B	Machine Learning Techniques	3	0	0	3
3	19150E75C	Software Project Management	3	0	2	3
4	19150E75D	Internet of Things	3	0	0	3
5	19150E75E	Service Oriented Architecture	3	0	0	3

ELECTIVE III (SEMESTER VII)

Sl. No	COURSE CODE	COURSE TITLE	L	T	P	C
THEORY						
1	19150E76A	Multi-core Architectures and Programming	3	0	0	3
2	19150E76B	Human Computer Interaction	3	0	0	3
3	19150E76C	C# and .Net Programming	3	0	0	3
4	19150E76D	Wireless Adhoc and Sensor Networks	3	0	2	3
5	19150E76E	Advanced Topics on Databases	3	0	0	3

ELECTIVE IV (SEMESTER VIII)

Sl. No	COURSE CODE	COURSE TITLE	L	T	P	C
THEORY						
1	19150E81A	Digital Image Processing	3	0	0	3
2	19150E81B	Social Network Analysis	3	0	0	3
3	19150E81C	Information Security	3	0	0	3
4	19150E81D	Cyber Forensics	3	0	0	3
5	19150E81E	Soft Computing	3	0	0	3

ELECTIVE V (SEMESTER VIII)

Sl. No	COURSE CODE	COURSE TITLE	L	T	P	C
THEORY						
1	19150E82A	Information Retrieval Techniques	3	0	0	3
2	19150E82B	Natural Language Processing	3	0	2	3
3	19150E82C	Parallel Algorithms	3	0	0	3
4	19150E82D	Speech Processing	3	0	0	3
5	19150E82E	Fundamentals of Nano Science	3	0	0	3

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OPENELECTIVE I (SEMESTER V)

Sl No	DEPT	COURSE CODE	COURSE TITLE	L	T	P	C
1.	ECE	19152OE54A	Basics Of Bio Medical Instrumentation	3	0	0	3
2.		19152OE54B	Sensors And Transducers	3	0	0	3
3.	EEE	19153OE54A	Industrial Nano Technology	3	0	0	3
4.		19153OE54B	Energy Conservation and Management	3	0	0	3
5.	MECH	19154OE54A	Renewable energy sources	3	0	0	3
6.		19154OE54B	Automotive Systems	3	0	0	3
7.	CIVIL	19155OE54A	Air Pollution And Control Engineering	3	0	0	3
8.		19155OE54B	Geographic Information Systems	3	0	0	3

OPENELECTIVE II (SEMESTER VII)

Sl No	DEPT	COURSE CODE	COURSE TITLE	L	T	P	C
1.	ECE	19152OE74A	Robotics	3	0	0	3
2.		19152OE74B	Electronic Devices	3	0	0	3
3.	EEE	19153OE74A	Basic Circuit Theory	3	0	0	3
4.		19153OE74B	Introduction To Renewable Energy Systems	3	0	0	3
5.	MECH	19154OE74A	Industrial Safety	3	0	0	3
6.		19154OE74B	Testing Of Materials	3	0	0	3
7.	CIVIL	19155OE74A	Green Building Design	3	0	0	3
8.		19155OE74B	Waste Water Treatment	3	0	0	3

TOTAL CREDITS – 197


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M.TECH FT

19250E24C	MACHINE LEARNING TECHNIQUES	L	T	P	C
		3	0	0	3

OBJECTIVES:

- To understand the need for machine learning for various problem solving
- To study the various supervised, semi-supervised and unsupervised learning algorithms in machine learning
- To understand the latest trends in machine learning
- To design appropriate machine learning algorithms for problem solving

UNIT INTRODUCTION 9

Introduction - Graph Terminologies - Types of Graphs - Sub Graph- Multi Graph - Regular Graph - Isomorphism - Isomorphic Graphs - Sub-graph - Euler graph - Hamiltonian Graph - Related Theorems.

UNIT II NEURAL NETWORKS AND GENETIC ALGORITHMS 9

Trees - Properties- Distance and Centres - Types - Rooted Tree-- Tree Enumeration - Labelled Tree - Unlabeled Tree - Spanning Tree - Fundamental Circuits- Cut Sets - Properties - Fundamental Circuit and Cut-set- Connectivity - Separability - Related Theorems.

UNIT III BAYESIAN AND COMPUTATIONAL LEARNING 9

Network Flows - Planar Graph - Representation - Detection - Dual Graph - Geometric and Combinatorial Dual - Related Theorems - Digraph - Properties - Euler Digraph.

UNIT IV INSTANT BASED LEARNING 9

Matrix Representation - Adjacency matrix- Incidence matrix- Circuit matrix - Cut-set matrix - Path Matrix- Properties - Related Theorems - Correlations, Graph Coloring - Chromatic Polynomial - Chromatic Partitioning - Matching - Covering - Related Theorems.

UNIT V ADVANCED LEARNING 9

Graph Algorithms- Connectedness and Components- Spanning Tree- Fundamental Circuits- Cut Vertices- Directed Circuits- Shortest Path - Applications overview.

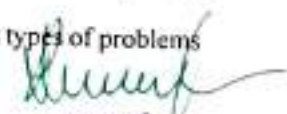
TOTAL : 45 PERIODS

OUTCOMES:

At the end of the course, the student should be able to:

- Differentiate between supervised, unsupervised, semi-supervised machine learning approaches
- Discuss the decision tree algorithm and identify and overcome the problem of overfitting
- Discuss and apply the back propagation algorithm and genetic algorithms to various problems
- Apply the Bayesian concepts to machine learning
- Analyse and suggest appropriate machine learning approaches for various types of problems

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19250E716B

INTERNET OF THINGS

L T P C

3 0 0 3

OBJECTIVES:

- To understand Smart Objects and IoT Architectures
- To learn about various IOT-related protocols
- To build simple IoT Systems using Arduino and Raspberry Pi.
- To understand data analytics and cloud in the context of IoT
- To develop IoT infrastructure for popular applications

UNIT I FUNDAMENTALS OF IoT 9

Evolution of Internet of Things - Enabling Technologies – IoT Architectures: oneM2M, IoT WorldForum (IoTWF) and Alternative IoT models – Simplified IoT Architecture and Core IoT FunctionalStack – Fog, Edge and Cloud in IoT – Functional blocks of an IoT ecosystem – Sensors, Actuators, Smart Objects and Connecting Smart Objects

UNIT II IoT PROTOCOLS 9

IoT Access Technologies: Physical and MAC layers, topology and Security of IEEE 802.15.4,802.15.4g, 802.15.4e, 1901.2a, 802.11ah and LoRaWAN – Network Layer: IP versions,Constrained Nodes and Constrained Networks – Optimizing IP for IoT: From 6LoWPAN to 6Lo, Routing over Low Power andLossy Networks – Application Transport Methods: Supervisory Control and Data Acquisition – Application Layer Protocols: CoAP and MQTT

UNIT III DESIGN AND DEVELOPMENT 9

Design Methodology - Embedded computing logic - Microcontroller, System on Chips - IoT systembuilding blocks - Arduino - Board details, IDE programming - Raspberry Pi - Interfaces and Raspberry Pi with Python Programming.

UNIT IV DATA ANALYTICS AND SUPPORTING SERVICES 9

Structured Vs Unstructured Data and Data in Motion Vs Data in Rest – Role of Machine Learning – No SQL Databases – Hadoop Ecosystem – Apache Kafka, Apache Spark – Edge Streaming Analytics and Network Analytics – Xively Cloud for IoT, Python Web Application Framework – Django – AWS for IoT – System Management with NETCONF-YANG

UNIT V CASE STUDIES/INDUSTRIAL APPLICATIONS 9

Cisco IoT system - IBM Watson IoT platform – Manufacturing - Converged Plant wide Ethernet Model (CPwE) – Power Utility Industry – GridBlocks Reference Model - Smart and Connected Cities: Layered architecture, Smart Lighting, Smart Parking Architecture and Smart Traffic Control

TOTAL : 45 PERIODS

OUTCOMES:

At the end of the course, the student should be able to:

- To develop IoT infrastructure for popular applications
- Discuss the Smart Objects and IoT Architectures


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OBJECTIVES:

To know the fundamental concepts of big data and analytics.

- To explore tools and practices for working with big data
- To learn about stream computing.
- To know about the research that requires the integration of large amounts of data

UNIT I INTRODUCTION TO BIG DATA 9

Evolution of Big data - Best Practices for Big data Analytics - Big data characteristics - Validating - The Promotion of the Value of Big Data - Big Data Use Cases- Characteristics of Big Data Applications - Perception and Quantification of Value -Understanding Big Data Storage - A General Overview of High-Performance Architecture - HDFS - MapReduce and YARN - Map Reduce Programming Model

9

UNIT II CLUSTERING AND CLASSIFICATION

Advanced Analytical Theory and Methods: Overview of Clustering - K-means - Use Cases - Overview of the Method - Determining the Number of Clusters - Diagnostics - Reasons to Choose and Cautions - Classification: Decision Trees - Overview of a Decision Tree - The General Algorithm - Decision Tree Algorithms - Evaluating a Decision Tree - Decision Trees in R - NaïveBayes - Bayes' Theorem - Naïve Bayes Classifier.

UNIT III ASSOCIATION AND RECOMMENDATION SYSTEM 9

Advanced Analytical Theory and Methods: Association Rules - Overview - Apriori Algorithm - Evaluation of Candidate Rules - Applications of Association Rules - Finding Association& findingsimilarity - Recommendation System: Collaborative Recommendation- Content Based Recommendation - Knowledge Based Recommendation- Hybrid Recommendation Approaches.


UNIT IV STREAM MEMORY 9

Introduction to Streams Concepts - Stream Data Model and Architecture - Stream Computing, Sampling Data in a Stream - Filtering Streams - Counting Distinct Elements in a Stream - Estimating moments - Counting oneness in a Window - Decaying Window - Real time AnalyticsPlatform(RTAP) applications - Case Studies - Real Time Sentiment Analysis, Stock Market Predictions. Using Graph Analytics for Big Data: Graph Analytics

UNIT V NOSQL DATA MANAGEMENT FOR BIG DATA AND VISUALIZATION 9

NoSQL Databases : Schema-less Models: Increasing Flexibility for Data Manipulation-Key Value Stores- Document Stores - Tabular Stores - Object Data Stores - Graph Databases Hive - Sharding - Hbase - Analyzing big data with twitter - Big data for E-Commerce Big data for blogsReview of Basic Data Analytic Methods using R.

TOTAL : 45 PERIODS


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OBJECTIVES:**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:

- 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.


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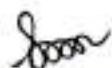

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UNIT I	INTRODUCTION	9
Origins and challenges of NLP – Language Modeling: Grammar-based LM, Statistical LM - Regular Expressions, Finite-State Automata – English Morphology, Transducers for lexicon and rules, Tokenization, Detecting and Correcting Spelling Errors, Minimum Edit Distance		
UNIT II	WORD LEVEL ANALYSIS	9
Unsmoothed N-grams, Evaluating N-grams, Smoothing, Interpolation and Backoff – Word Classes, Part-of-Speech Tagging, Rule-based, Stochastic and Transformation-based tagging, Issues in PoStagging – Hidden Markov and Maximum Entropy models.		
UNIT III	SYNTACTIC ANALYSIS	9
Context-Free Grammars, Grammar rules for English, Treebanks, Normal Forms for grammar – Dependency Grammar – Syntactic Parsing, Ambiguity, Dynamic Programming parsing – Shallow parsing – Probabilistic CFG, Probabilistic CYK, Probabilistic Lexicalized CFGs - Feature structures, Unification of feature structures.		
UNIT IV	SEMANTICS AND PRAGMATICS	10
Requirements for representation, First-Order Logic, Description Logics – Syntax-Driven Semantic analysis, Semantic attachments – Word Senses, Relations between Senses, Thematic Roles, selectional restrictions – Word Sense Disambiguation, WSD using Supervised, Dictionary & Thesaurus, Bootstrapping methods – Word Similarity using Thesaurus and Distributional methods.		
UNIT V	DISCOURSE ANALYSIS AND LEXICAL RESOURCES	8
Discourse segmentation, Coherence – Reference Phenomena, Anaphora Resolution using Hobbs and Centering Algorithm – Coreference Resolution – Resources: Porter Stemmer, Lemmatizer, Penn Treebank, Brill's Tagger, WordNet, PropBank, FrameNet, Brown Corpus, British National Corpus (BNC)		

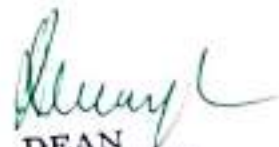
TOTAL : 45 PERIODS

OUTCOMES:**At the end of the course, the student 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 the use of different statistical approaches for different types of NLP applications.



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19250E34C

Speech Processing

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OBJECTIVES:

- To understand the fundamentals of the speech processing
- Explore the various speech models
- Gather knowledge about the phonetics and pronunciation processing
- Perform wavelet analysis of speech
- To understand the concepts of speech recognition

UNIT I INTRODUCTION

9

Introduction - knowledge in speech and language processing - ambiguity - models and algorithms - language - thought - understanding - regular expression and automata - words & transducers - Ngrams

UNIT II SPEECH MODELLING

9

Word classes and part of speech tagging - hidden markov model - computing likelihood: the forward algorithm - training hidden markov model - maximum entropy model - transformation- based tagging - evaluation and error analysis - issues in part of speech tagging - noisy channel model for spelling.

UNIT III SPEECH PRONUNCIATION AND SIGNAL PROCESSING

9

Phonetics - speech sounds and phonetic transcription - articulatory phonetics - phonological categories and pronunciation variation - acoustic phonetics and signals - phonetic resources - articulatory and gestural phonology

UNIT IV SPEECH IDENTIFICATION

9

Speech synthesis - text normalization - phonetic analysis - prosodic analysis - diphone waveform synthesis - unit selection waveform synthesis - evaluation

UNIT V SPEECH RECOGNITION

9

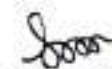
Automatic speech recognition - architecture - applying hidden markov model - feature extraction: mfcc vectors - computing acoustic likelihoods - search and decoding - embedded training - multipass decoding: n-best lists and lattices- a* (stack) decoding - context-dependent acoustic models: triphones - discriminative training - speech recognition by humans.

TOTAL : 45 PERIODS

OUTCOMES:

At the end of the course, the student should be able to:

- Create new algorithms with speech processing
- Derive new speech models
- Perform various language phonetic analysis
- Create a new speech identification system
- Generate a new speech recognition system


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M.TECH PART TIME

19150E44BP

Data Warehousing and Mining

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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) 9

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 9

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 9

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

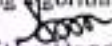
UNIT IV CLASSIFICATION AND CLUSTERING 9

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 high dimensional data- Clustering with constraints, Outlier analysis-outlier detection methods.

UNIT V WEKA TOOL 9

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.


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TOTAL : 45 PERIODS

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CLOUD COMPUTING

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3 0 0 3

OBJECTIVES:

- To learn about the concept of cloud and utility computing.
- To have knowledge on the various issues in cloud computing.
- To be familiar with the lead players in cloud.
- To appreciate the emergence of cloud as the next generation computing paradigm.

UNIT I INTRODUCTION TO CLOUD COMPUTING 9

Introduction to Cloud Computing – Roots of Cloud Computing – Desired Features of Cloud Computing – Challenges and Risks – Benefits and Disadvantages of Cloud Computing.

UNIT II VIRTUALIZATION 9

Introduction to Virtualization Technology – Load Balancing and Virtualization – Understanding Hypervisor – Seven Layers of Virtualization – Types of Virtualization – Server, Desktop, Application Virtualization.

UNIT III CLOUD ARCHITECTURE, SERVICES AND STORAGE 9

NIST Cloud Computing Reference Architecture – Public, Private and Hybrid Clouds - IaaS – PaaS – SaaS – Architectural Design Challenges – Cloud Storage.

UNIT IV RESOURCE MANAGEMENT AND SECURITY IN CLOUD 9

Inter Cloud Resource Management – Resource Provisioning Methods – Security Overview – Cloud Security Challenges – Data Security – Application Security – Virtual Machine Security.

UNIT V CASE STUDIES 9

Google App Engine(GAE) – GAE Architecture – Functional Modules of GAE – Amazon WebServices(AWS) – GAE Applications – Cloud Software Environments – Eucalyptus – Open Nebula – Open Stack.

TOTAL : 45 PERIODS

OUTCOMES:

At the end of the course, the student should be able to:

- Articulate the main concepts, key technologies, strengths and limitations of cloud computing.
- Learn the key and enabling technologies that help in the development of cloud.
- Develop the ability to understand and use the architecture of compute and storage cloud, service and delivery models.
- Explain the core issues of cloud computing such as resource management and security.
- Be able to install and use current cloud technologies.
- Choose the appropriate technologies, algorithms and approaches for implementation and use of cloud.

TEXTBOOKS:

1. Buyya R., Broberg J., Goscinski A., "Cloud Computing: Principles and Paradigm", First Edition, John Wiley & Sons, 2011.
2. Kai Hwang, Geoffrey C. Fox, Jack G. Dongarra, "Distributed and Cloud Computing, From Parallel Processing to the Internet of Things", Morgan Kaufmann Publishers, 2012.

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19160E64AP

SOCIAL NETWORK ANALYSIS

L T P C

3 0 0 3

- To understand the concept of semantic web and related applications.
- To learn knowledge representation using ontology.
- To understand human behaviour in social web and related communities.
- To learn visualization of social networks.

UNIT I INTRODUCTION

9

Introduction to Semantic Web: Limitations of current Web - Development of Semantic Web - Emergence of the Social Web - Social Network analysis: Development of Social Network Analysis - Key concepts and measures in network analysis - Electronic sources for network analysis: Electronic discussion networks, Blogs and online communities - Web-based networks - Applications of Social Network Analysis.

UNIT II MODELLING, AGGREGATING AND KNOWLEDGE REPRESENTATION

9

Ontology and their role in the Semantic Web: Ontology-based knowledge Representation - Ontology languages for the Semantic Web: Resource Description Framework - Web Ontology Language - Modelling and aggregating social network data: State-of-the-art in network data representation - Ontological representation of social individuals - Ontological representation of social relationships - Aggregating and reasoning with social network data - Advanced representations.

UNIT III EXTRACTION AND MINING COMMUNITIES IN WEB SOCIAL NETWORKS

9

Extracting evolution of Web Community from a Series of Web Archive - Detecting communities in social networks - Definition of community - Evaluating communities - Methods for community detection and mining - Applications of community mining algorithms - Tools for detecting communities social network infrastructures and communities - Decentralized online social networks - Multi- Relational characterization of dynamic social network communities.

UNIT IV PREDICTING HUMAN BEHAVIOUR AND PRIVACY ISSUES

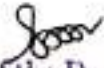
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Understanding and predicting human behaviour for social communities - User data management - Inference and Distribution - Enabling new human experiences - Reality mining - Context - Awareness - Privacy in online social networks - Trust in online environment - Trust models based on subjective logic - Trust network analysis - Trust transitivity analysis - Combining trust and reputation - Trust derivation based on trust comparisons - Attack spectrum and countermeasures.

UNIT V VISUALIZATION AND APPLICATIONS OF SOCIAL NETWORKS

9

Graph theory - Centrality - Clustering - Node-Edge Diagrams - Matrix representation - Visualizing online social networks, Visualizing social networks with matrix-based representations - Matrix and Node-Link Diagrams - Hybrid representations - Applications - Cover networks - Community welfare - Collaboration networks - Co-Citation networks.


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OBJECTIVES:

- To understand Smart Objects and IoT Architectures
- To learn about various IOT-related protocols
- To build simple IoT Systems using Arduino and Raspberry Pi.
- To understand data analytics and cloud in the context of IoT
- To develop IoT infrastructure for popular applications

UNIT I FUNDAMENTALS OF IoT 9

Evolution of Internet of Things - Enabling Technologies – IoT Architectures: oneM2M, IoT WorldForum (IoTWF) and Alternative IoT models – Simplified IoT Architecture and Core IoT FunctionalStack – Fog, Edge and Cloud in IoT – Functional blocks of an IoT ecosystem – Sensors, Actuators, Smart Objects and Connecting Smart Objects

UNIT II IoT PROTOCOLS 9

IoT Access Technologies: Physical and MAC layers, topology and Security of IEEE 802.15.4,802.15.4g, 802.15.4e, 1901.2a, 802.11ah and LoRaWAN – Network Layer: IP versions,Constrained Nodes and Constrained Networks – Optimizing IP for IoT: From 6LoWPAN to 6Lo, Routing over Low Power and Lossy Networks – Application Transport Methods: Supervisory Control and Data Acquisition – Application Layer Protocols: CoAP and MQTT

UNIT III DESIGN AND DEVELOPMENT 9

Design Methodology - Embedded computing logic - Microcontroller, System on Chips - IoT system building blocks - Arduino - Board details, IDE programming - Raspberry Pi - Interfaces and Raspberry Pi with Python Programming.

UNIT IV DATA ANALYTICS AND SUPPORTING SERVICES 9

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UNIT V CASE STUDIES/INDUSTRIAL APPLICATIONS 9

Cisco IoT system - IBM Watson IoT platform – Manufacturing - Converged Plant wide Ethernet Model (CPwE) – Power Utility Industry – GridBlocks Reference Model - Smart and Connected Cities: Layered architecture, Smart Lighting, Smart Parking Architecture and Smart Traffic Control

TOTAL : 45 PERIODS


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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Value added courses

205150WP WEB PROGRAMMING

UNIT I INTRODUCTION TO WWW

Internet Standards – Introduction to WWW – WWW Architecture – SMTP – POP3 – File Transfer Protocol - Overview of HTTP, HTTP request – response — Generation of dynamic web pages.

UNIT II UI DESIGN Markup Language (HTML5):

Basics of Html -Syntax and tags of Html- Introduction to HTML5 -Semantic/Structural Elements **Cascading Style Sheet (CSS3):** The need for CSS – Basic syntax and structure InlineStyles – Embedding Style Sheets

UNIT III OVERVIEW OF JAVASCRIPT

Introduction - Core features - Data types and Variables - Operators, Expressions, and Statements Functions - Objects - Array, Date and Math Related Objects - Document Object Model - Event Handling - Controlling Windows & Frames and Documents - Form validations.

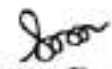
UNIT IV ADVANCED FEATURES OF JAVASCRIPT


Browser Management and Media Management – Classes – Constructors – Object-Oriented Techniques in JavaScript – Object constructor and Prototyping - Sub classes and Super classes – Introduction to JSON – JSON Structure

UNIT V PHP

Introduction - How web works - Setting up the environment (LAMP server) - Programming basics Print/echo - Variables and constants – Strings and Arrays – Operators, Control structures and looping structures

Duration:45Hours


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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Value added courses

205150MAD- MOBILE APP DEVELOPMENT USING ANDROID STUDIO

UNIT – II INTRODUCTION TO ANDROID

The Android Platform, Android SDK, Eclipse Installation, Android Installation, Building you First Android application, Understanding Anatomy of Android Application, Android Manifest file.

UNIT – II ANDROID APPLICATION DESIGN ESSENTIALS

Anatomy of an Android applications, Android terminologies, Application Context, Activities, Services, Intents, Receiving and Broadcasting Intents, Android Manifest File and its common settings, Using Intent Filter, Permissions.

UNIT – III ANDROID USER INTERFACE DESIGN ESSENTIALS

User Interface Screen elements, Designing User Interfaces with Layouts, Drawing and Working with Animation.

UNIT – IV TESTING ANDROID APPLICATIONS

Publishing Android application, Using Android preferences, Managing Application resources in a hierarchy, working with different types of resources.

UNIT – V USING COMMON ANDROID APIS

Using Android Data and Storage APIs, Managing data using Sqlite, Sharing Data between Applications with Content Providers, Using Android Networking APIs, Using Android Web APIs, Using Android Telephony APIs, Deploying Android Application to the World.

Duration:45Hours



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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
Value added courses

205150DAG DEVELOPING APPS WITH GOOGLE CLOUD PLATFORM

UNIT I : OVERVIEW CLOUD & GOOGLE CLOUD PLATFORM

Cloud Overview & Characteristics, Cloud Service Model (IaaS, PaaS, SaaS), Cloud Deployment Model (Public, Private, Hybrid), Google Cloud Platform (Gcp) Infrastructure Overview.

UNIT II- VIRTUAL MACHINES

Compute Engine (Vm): Types & Options, Vm Instance Lifecycle & Common Operations, Machine Types & Compute Options (Vcpu And Memory) In Compute Engine, Images & Snapshots, Disk Types: Local Ssd, Persistent & Balanced

UNIT III: VIRTUAL NETWORKS

Virtual Private Cloud (Vpc) & Types, Subnets, Ip Address (Public/Private), Nic, Routes & Route Table, Firewalls, Network Topology Options

UNIT IV: CLOUD IAM


Iam Basic: Authentication, Authorization & Mfa, Roles, Members, Service Account, Policy, Resource Hierarchy, Cloud Iam Best Practices

UNIT V: DATA STORAGE SERVICES

Google Cloud Storage Overview & Structure, Classes, Versioning & Lifecycle Policies, Cloud Sql For Database (Mysql, Postgresql And SqlServer), Cloud Spanner: Fully Managed Relational Db.

Duration:45Hours


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SCHOOL OF ENGINEERING AND TECHNOLOGY
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MEETING OF BOARD OF STUDIES IN CIVIL ENGINEERING

The Meeting of the Board of Studies in Department of civil Engineering was held on 11.04.2019 at 2.30 PM in Civil Lab at Prist Deemed to be University under the chairmanship of Dr. ASHUTOSH DAS

The following Members were present for the meeting:

S.No.	Name of the Member	Position	Role
1	Dr. ASHUTOSH DAS	Professor	Chair Person
2	Dr. S.MANJULA	Assistant Professor-NIT Trichy	External Member
3	MR.P.VADIVEL	Divisional engineer-highways department, Trichy.	External Member
4	Dr.IRAIKARKUZHALI	Professor	Internal Member
5	Dr.P.PARAMAGURU	Associate Professor	Internal Member
6	Dr.R.SIVA SAMUNDY	Associate Professor	Internal Member
7	D.AMAL COLINS	Associate Professor	Internal Member
8	S.RAMAKRISHNAN	Associate Professor	Internal Member
9	B.JOSE RAVINDRA RAJ	Assistant Professor	Internal Member
10	D.JEYAKUMAR	Assistant Professor	Internal Member
11	A.BELCIYA MARY	Assistant Professor	Internal Member
12	K.SHANTHI	Assistant Professor	Internal Member
13	J.SANTHIYAA JENIFER	Assistant Professor	Internal Member
14	R.DEVI	Assistant Professor	Internal Member
15	P.VENKATESWARAN	Assistant Professor	Internal Member
16	S.RAVISHANKAR	Assistant Professor	Internal Member
17	M.KARPAGAM	Assistant Professor	Internal Member
18	T.VIDHUDHALAI	Assistant Professor	Internal Member

- The Chairman, Board of Studies in the Department of civil Engineering welcomed the members and briefed about the existing curriculum and syllabi.

B. Prasad
Head of the Department

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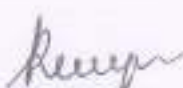
- The Chairman, Board of Studies in the Department of civil Engineering welcomed the members and briefed about the existing curriculum and syllabi.
- The members of the Board thoroughly scrutinized the existing curriculum and syllabi for B.TECH - CIVIL(Full Time), M.TECH – Structural Engineering (Full Time), B.TECH – Civil (Part Time), M.TECH– Structural Engineering (Part Time) and feedbacks on curriculum obtained from various stakeholders and it is resolved to consider the feedbacks during forth coming syllabus revision.
- In the current regulation the courses have been classified as core course, elective course, foundation course and non-CGPA courses.
- It is proposed to follow the revised CIA assessment pattern for experiential learning involved theory courses and highly significant practical courses.
- It is suggested by the board to introduce the Program Exit Examination course in the curriculum to motivate the students towards writing competitive examination and to improve their technical skills.
- The committee proposed to follow the system of evaluation pattern for the project work.
- It is also proposed to consider Value Education and Fundamentals of Indian Constitution and Economy as Non-CGPA credit course.
- The members of the board also scrutinized and updated the panel of examiners and recommended to continue with existing panel of examiners for the B.TECH –Civil (FT) & M.TECH – Structural Engineering (FT), B.TECH – Civil (PT), M.TECH – Structural Engineering (PT) and submitted the same for the Academic Council for its approval.
- Also the members of the board have unanimously recommended continuing with the existing curriculum of Regulation 2017 with addition of 2 new electives in 5th and 6th semester which is to be followed in the academic year 2019 –20 for B. Tech Civil (Full Time).

The List of suggested subjects are:

S. No	Name of the Course
1	Cartography
2	Off shore Structures

- Apart from Curriculum courses the Board members discussed with the feedback taken from various stake holders with respect of increasing the skill and potential of students. Finally came out with suggesting 4 new courses can introduced as Value added courses for the benefit of students.
- The list of suggested Value added courses are as follows:


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- ✓ 3D Printing Technology for Civil Engineering
- ✓ BIM Fundamentals for Engineers
- ✓ Fire Protection, Services and Maintenance
- ✓ River Engineering

The meeting was concluded with a thanks from the BOS Chairman.

B. Arun
Head of the Department
Department of Civil Engineering
Pottaiyah Ramajayam Institute of
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Vallam, Thanjavur-613,403.

Signature of the Member

S.No.	Name of the Member	Signature of the Member
1	Dr. ASHUTOSH DAS	<i>Ashutosh</i>
2	Dr. S.MANJULA	<i>Manjula</i>
3	MR.P.VADIVEL	<i>P. Vadivel</i>
4	Dr.IRAIKARKUZHALI	<i>Irakaran</i>
5	Dr.P.PARAMAGURU	<i>Parama</i>
6	Dr.R.SIVA SAMUNDY	<i>R. Sivaraj</i>
7	D.AMAL COLINS	<i>Amal</i>
8	S.RAMAKRISHNAN	<i>Ramakrishnan</i>
9	BJOSE RAVINDRA RAJ	<i>B. Jose</i>
10	DJEYAKUMAR	<i>D. Jayakumar</i>
11	A.BELCIYA MARY	<i>A. Belciya Mary</i>
12	K.SHANTHI	<i>K. Shanthi</i>
13	J.SANTHIYAA JENIFER	<i>J. Santhiya Jennifer</i>
14	R.DEVI	<i>R. Devi</i>
15	P.VENKATESWARAN	<i>P. Venkateswaran</i>
16	S.RAVISHANKAR	<i>S. Ravishankar</i>
17	M.KARPAGAM	<i>M. Karpagam</i>
18	T.VIDHUDHALAI	<i>T. Vidhudhalai</i>

B. Anand
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**B.Tech-Civil Engineering – Full Time-2017R
SEMESTER I**

Sl.No	Course Code	Course Title	Periods			Credit
			Per Week			
THEORY						
L	T	P				
1	17147S11	Communicative English	5	1	0	4
2	17148S12	Engineering Mathematics - I	5	1	0	4
3	17149S13	Engineering Physics	5	1	0	4
4	17149S14	Engineering Chemistry	5	1	0	4
5	17154S15	Engineering Graphics	5	1	0	4
6	17150S16	Problem Solving and Python Programming	5	1	0	4
PRACTICALS						
7	17150L17	Problem Solving and Python Programming Laboratory	0	0	3	2
8	17149L18	Physics and Chemistry Laboratory	0	0	3	2
9	171VEA.19	Value Education				1
TOTAL						29

SEMESTER II

Sl. No	COURSE CODE	COURSE TITLE	L	T	P	C
THEORY						
1.	17147S21	Technical English (All Branches)	5	1	0	4
2.	17148S22A	Engineering Mathematics II (All Branches)	5	1	0	4
3.	17149S23D	Physics for Civil Engineering	5	1	0	4
4.	17149S24A	Environmental Science And Engineering	5	1	0	4
5.	17153S25E	Basic Electrical And Electronics Engineering	5	1	0	4
6.	17154S26D	Engineering Mechanics	5	1	0	4
PRACTICALS						
7.	17154L27	Engineering Practices Laboratory	0	0	4	2
8.	17155L28E	Computer Aided Building Drawing Lab	0	0	4	2
9.	171HCA29	Fundamentals of Indian Constitution and Economy	0	0	0	1
TOTAL			21	0	8	29

SEMESTER III

S. No	Sub. Code	Name of the Subject	L	T	P	C
THEORY						
1	17148S31C	Transforms and Partial Differential Equations	4	0	0	4
2	17155C32	Engineering Geology	4	0	0	4
3	17155C33	Construction Materials	4	0	0	4
4	17155C34	Strength of Materials-I	4	0	0	4
5	17155C35	Fluid Mechanics	4	0	0	3

B. Kumar
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6	17155C36	Surveying	4	0	0	3
PRACTICALS						
7	17155L37	Surveying Laboratory	0	0	3	2
8	17155L38	Construction Materials Laboratory	0	0	3	2
9	17155L39	Interpersonal Skills / Listening and Speaking	0	0	2	1
TOTAL						27

SEMESTER IV

S. No	Sub. Code	Name of the Subject	L	T	P	C
THEORY						
1	17148S41C	Numerical Methods	4	0	0	4
2	17155C42	Construction Techniques and Practices	3	0	0	3
3	17155C43	Strength of Materials II	4	0	0	4
4	17155C44	Applied Hydraulic Engineering	4	0	0	4
5	17155C45	Concrete Technology	3	0	0	3
6	17155C46	Soil Mechanics	3	0	0	3
PRACTICALS						
7	17155L47	Strength of Materials Lab	0	0	3	2
8	17155L48	Hydraulic Engineering Lab	0	0	3	2
9	17155L49	Advanced Reading & Writing	0	0	2	1
10	17155CRS	Research Led Seminar	0	0	2	1
TOTAL						27

SEMESTER - V

S. No	Sub. Code	Name of the Subject	L	T	P	C
THEORY						
1	17155C51	Design of Reinforced Cement Concrete Elements	4	0	0	4
2	17155C52	Structural Analysis I	3	0	0	3
3	17155C53	Water Supply Engineering	4	0	0	4
4	17155PE54	Free Elective I	3	0	0	3
5	17155E55	Elective I	3	0	0	3
6	17155C56	Foundation Engineering	3	0	0	3
PRACTICALS						
7	17155L57	Soil Mechanics Lab	0	0	3	2
8	17155L58	Water and Waste Water Analysis Lab	0	0	3	2
9	17155L59	Survey Camp	0	0	2	2
10	17155CRM	Research Methodology	0	0	2	3
TOTAL						29

B. P. S.
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SEMESTER – VI

S. No	Sub. Code	Name of the Subject	L	T	P	C
THEORY						
1	17155C61	Design of Steel Structural Elements	3	0	0	3
2	17155C62	Structural Analysis II	4	0	0	4
3	17155C63	Irrigation Engineering	3	0	0	3
4	17155C64	Highway Engineering	3	0	0	3
5	17155C65	Waste Water Engineering	3	0	0	3
6	17155E66	Elective II	3	0	0	3
PRACTICALS						
7	17155L67	Highway Engineering Laboratory	0	0	3	2
8	17155L68	Irrigation and Environmental Engineering Drawing	0	0	3	2
9	17155L69	Professional Communication	0	0	2	2
10	17155CBR	Participation in Bounded Research	0	0	2	2
TOTAL						27

SEMESTER – VII

S. No	Sub. Code	Name of the Subject	L	T	P	C
THEORY						
1	17155C71	Estimation, Costing & Valuation Engineering	4	0	0	3
2	17155C72	Railways, Airports, Docks And Harbour Engineering	4	0	0	3
3	17155C73	Structural Design and drawing	4	0	0	4
4	17155E74	Free Elective II	4	0	0	3
5	17155E75	Elective III	4	0	0	4
PRACTICALS						
6	17155L76	Creative and Innovation project (activity based subject related)	0	0	4	2
7	17155L77	Industrial Training (4 Weeks during VI th Sem Summer)	0	0	0	2
8	17155L78	Technical Seminar	0	0	2	1
9	17155CSR	Design / Socio - Technical Project (Participated Scaffolded Research)	0	0	4	4
TOTAL						26

SEMESTER – VIII

S. No	Sub. Code	Name of the Subject	L	T	P	C
1	17155E81	Elective IV	4	0	0	3
2	17155E82	Elective V	4	0	0	3
3	17155PW83	Project Work	0	0	20	10
4	17155COM	COMPS	0	0	2	2
TOTAL						18

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**LIST OF ELECTIVES
SEMESTER – V
ELECTIVE I**

S. No	Sub. Code	Name of the Subject	L	T	P	C
1	17155E55A	Digital Cadastre	4	1	0	3
2	17155E55B	Advanced Surveying	4	1	0	3
3	17155E55C	Geographic Information System	4	1	0	3
4	17155E55D	Geo informatics Applications for Civil Engineers	4	1	0	3
5	17155E55E	Total Station and GPS Surveying	4	1	0	3
6	17155E55F	Disaster Management	4	1	0	3
7	17155E55G	Human Rights	4	1	0	3
8	17155E55H	Cartography	4	1	0	3

**SEMESTER – VI
ELECTIVE II**

S. No	Sub. Code	Name of the Subject	L	T	P	C
1	17155E66A	Ground Improvement Techniques	4	1	0	3
2	17155E66B	Introduction to soil dynamics and machine foundation	4	1	0	3
3	17155E66C	Rock Engineering	4	1	0	3
4	17155E66D	Urban planning and development	4	1	0	3
5	17155E66E	Building Technology	4	1	0	3
6	17155E66F	Intellectual property rights	4	1	0	3
7	17155E66G	Off shore Structures	4	1	0	3

**SEMESTER – VII
ELECTIVE III**

S. No	Sub. Code	Name of the Subject	L	T	P	C
1	17155E75A	Pavement Engineering	3	1	0	4
2	17155E75B	Engineering Economics and Cost Analysis	3	1	0	4
3	17155E75C	Transport and Environment	3	1	0	4
4	17155E75D	Industrial Structures	3	1	0	4
5	17155E75E	Environmental and social impact assessment	3	1	0	4
6	17155E75F	Design of Prestressed concrete structures	3	1	0	4
7	17155E75G	Construction planning and scheduling	3	1	0	4
8	17155E75H	Municipal solid waste management	3	1	0	4
9	17160E75I	Total quality management	3	1	0	4

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**SEMESTER – VIII
ELECTIVE IV**

S. No	Sub. Code	Name of the Subject	L	T	P	C
1	17155E81A	Coastal Engineering	4	1	0	3
2	17155E81B	Participatory water resources management	4	1	0	3
3	17155E81C	Integrated water resources management	4	1	0	3
4	17155E81D	Groundwater engineering	4	1	0	3
5	17155E81E	Water resources system systems engineering	4	1	0	3
6	17155E81F	Geo-environmental engineering	4	1	0	3
7	17155E81G	Hydrology and water resources engineering	4	1	0	3
8	17155E81H	Professional ethics in engineering	4	1	0	3

ELECTIVE V

S. No	Sub. Code	Name of the Subject	L	T	P	C
1	17155E82A	Computer aided design of structures	4	1	0	3
2	17155E82B	Maintenance, repair and rehabilitation of structures	4	1	0	3
3	17155E82C	Structural dynamics and earthquake engineering	4	1	0	3
4	17155E82D	Prefabricated structures	4	1	0	3
5	17155E82E	Bridge engineering	4	1	0	3
6	17155E82F	Foundation of nano science	4	1	0	3

FREE ELECTIVE-I

1	17150FE54A	Database Management Systems (CSE)	3	0	0	3
2	17150FE54B	Cloud Computing (CSE)	3	0	0	3
3	17152FE54A	Basic Of Bio Medical Instrumentation (ECE)	3	0	0	3
4	17152FE54B	Sensor and Transducers (ECE)	3	0	0	3
5	17153FE54A	Industrial Nano Technology (EEE)	3	0	0	3
6	17153FE54B	Energy Conservation and Management (EEE)	3	0	0	3
7	17154FE54A	Renewable Energy Sources (MECH)	3	0	0	3
8	17154FE54B	Automotive Systems (MECH)	3	0	0	3
9	17155FE54A	Air Pollution And Control Engineering	3	0	0	3
10	17155FE54B	Geographic Information Systems	3	0	0	3

B. Jeyaraj
Head of the Department
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FREE ELECTIVE-II

1	17150FE74A	Introduction to C Programming (CSE)	3	0	0	3
2	17150FE74B	Data Structures & Algorithms (CSE)	3	0	0	3
3	17152FE74A	Robotics (ECE)	3	0	0	3
4	17152FE74B	Electronic Devices (ECE)	3	0	0	3
5	17153FE74A	Basic Circuit Theory (EEE)	3	0	0	3
6	17153FE74B	Introduction to Renewable Energy Systems (EEE)	3	0	0	3
7	17154FE74A	Industrial Safety (MECH)	3	0	0	3
8	17154FE74B	Testing of Materials (MECH)	3	0	0	3



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**B.Tech-Civil Engineering – Full Time-2019R
SEMESTER I**

Sl.No	Course Code	Course Title	Periods			Credit
			L	T	P	
THEORY						
1	19147S11	Communicative English	4	0	0	4
2	19148S12	Engineering Mathematics – I	3	2	0	4
3	19149S13	Engineering Physics	3	0	0	3
4	19149S14	Engineering Chemistry	3	0	0	3
5	19154S15	Engineering Graphics	2	0	4	4
6	19150S16	Problem Solving and Python Programming	3	0	0	3
PRACTICALS						
7	19150L17	Problem Solving and Python Programming Laboratory	0	0	3	2
8	19149L18	Physics and Chemistry Laboratory	0	0	3	2
9	191VEA19	Value Education				-
TOTAL						25

SEMESTER II

Sl. No	COURSE CODE	COURSE TITLE	L	T	P	C
THEORY						
1.	19147S21	Technical English (All Branches)	4	0	0	4
2.	19148S22A	Engineering Mathematics II (All Branches)	4	0	0	4
3.	19149S23D	Physics for Civil Engineering	3	0	0	3
4.	19149S24A	Environmental Science And Engineering	3	0	0	3
5.	19153S25E	Basic Electrical And Electronics Engineering	3	0	0	3
6.	19154S26D	Engineering Mechanics	3	2	0	4
PRACTICALS						
7.	19154L27	Engineering Practices Laboratory	0	0	3	2
8.	19155L28E	Computer Aided Building Drawing Lab	0	0	3	2
9.	191ICA29	Fundamentals of Indian Constitution and Economy	0	0	0	-
TOTAL			20	2	6	25

SEMESTER III

S. No	Sub. Code	Name of the Subject	L	T	P	C
THEORY						
1	19148S31C	Transforms and Partial Differential Equations	4	0	0	4
2	19155C32	Engineering Geology	3	2	0	4
3	19155C33	Construction Materials	4	0	0	4
4	19155C34	Strength of Materials-I	3	0	0	3

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5	19155C35	Fluid Mechanics	3	2	0	4
6	19155C36	Surveying	4	0	0	3
PRACTICALS						
7	19155L37	Surveying Laboratory	0	0	3	2
8	19155L38	Construction Materials Laboratory	0	0	3	2
9	19155L39	Interpersonal Skills / Listening and Speaking	0	0	2	1
TOTAL						27


SEMESTER IV

S. No	Sub. Code	Name of the Subject	L	T	P	C
THEORY						
1	19148S41C	Numerical Methods	4	0	0	4
2	19155C42	Construction Techniques and Practices	3	2	0	4
3	19155C43	Strength of Materials II	4	0	0	4
4	19155C44	Applied Hydraulic Engineering	3	0	0	3
5	19155C45	Concrete Technology	3	2	0	4
6	19155C46	Soil Mechanics	3	0	0	3
PRACTICALS						
7	19155L47	Strength of Materials Lab	0	0	3	2
8	19155L48	Hydraulic Engineering Lab	0	0	3	2
9	19155L49	Advanced Reading & Writing	0	0	2	1
10	19155CRS	Research Led Seminar	0	0	2	1
TOTAL						28

SEMESTER - V

S. No	Sub. Code	Name of the Subject	L	T	P	C
THEORY						
1	19155C51	Design of Reinforced Cement Concrete Elements	4	0	0	4
2	19155C52	Structural Analysis I	3	2	0	4
3	19155C53	Water Supply Engineering	3	0	0	3
4	19155FES4	Open Elective I	3	0	0	3
5	19155E55	Elective I	3	0	0	3
6	19155C56	Foundation Engineering	3	0	0	3
PRACTICALS						
7	19155L57	Soil Mechanics Lab	0	0	3	2
8	19155L58	Water and Waste Water Analysis Lab	0	0	3	2
9	19155L59	Survey Camp	0	0	2	2
10	19155CRM	Research Methodology	0	0	2	3
TOTAL						29


 Head of the Department
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SEMESTER - VI

S. No	Sub. Code	Name of the Subject	L	T	P	C
THEORY						
1	19155C61	Design of Steel Structural Elements	3	0	0	3
2	19155C62	Structural Analysis II	3	2	0	4
3	19155C63	Irrigation Engineering	3	0	0	3
4	19155C64	Highway Engineering	3	2	0	4
5	19155C65	Waste Water Engineering	3	0	0	3
6	19155E66	Elective II	3	0	0	3
PRACTICALS						
7	19155L67	Highway Engineering Laboratory	0	0	3	2
8	19155L68	Irrigation and Environmental Engineering Drawing	0	0	3	2
9	19155L69	Professional Communication	0	0	2	2
10	19155CBR	Participation in Bounded Research	0	0	2	2
TOTAL						28

SEMESTER - VII

S. No	Sub. Code	Name of the Subject	L	T	P	C
THEORY						
1	19155C71	Estimation, Costing & Valuation Engineering	4	0	0	4
2	19155C72	Railways, Airports, Docks And Harbour Engineering	3	2	0	4
3	19155C73	Structural Design and drawing	3	2	0	4
4	19155FE74	Open Elective II	4	0	0	3
5	19155E75	Elective III	4	0	0	3
PRACTICALS						
6	19155L76	Creative and Innovation project (Activity based subject related)	0	0	4	2
7	19155L77	Industrial Training (4 Weeks during VIth Sem Summer)	0	0	0	2
8	19155L78	Technical Seminar	0	0	2	1
9	19155CSR	Design Project / Socio Technical Project (Participated Scaffolded Research)	0	0	4	4
TOTAL						27

SEMESTER - VIII

S. No	Sub. Code	Name of the Subject	L	T	P	C
1	19155E81	Elective IV	3	0	0	3
2	19155E82	Elective V	3	0	0	3
3	19155PW83	Project Work	0	0	30	15
4	19155PEE	Program Exit Exam				2
TOTAL						23

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**LIST OF ELECTIVES
SEMESTER - V**

S. No	Sub. Code	Name of the Subject	L	T	P	C
1	19155E55A	Digital Cadastre	3	0	0	3
2	19155E55B	Advanced Surveying	3	0	0	3
3	19155E55C	Geographic Information System	3	0	0	3
4	19155E55D	Geo Informatics Applications for Civil Engineers	3	0	0	3
5	19155E55E	Failure Analysis of Structures	3	0	0	3
6	19155E55F	A Seismic Design of Structures	3	0	0	3
7	19155E55G	Industrial Wastewater Treatment	3	0	0	3

ELECTIVE I

**SEMESTER - VI
ELECTIVE II**

S. No	Sub. Code	Name of the Subject	L	T	P	C
1	19155E66A	Ground Improvement Techniques	3	0	0	3
2	19155E66B	Introduction to soil dynamics and machine foundation	3	0	0	3
3	19155E66C	Rock Engineering	3	0	0	3
4	19155E66D	Urban planning and development	3	0	0	3
5	19155E66E	Air Pollution & Control Engineering	3	0	0	3
6	19155E66F	Stability of Structures	3	0	0	3
7	19155E66G	Industrial Structures	3	0	0	3

**SEMESTER - VII
ELECTIVE III**

S. No	Sub. Code	Name of the Subject	L	T	P	C
1	19155E75A	Transport and Environment	3	0	0	3
2	19155E75B	Design of Prestressed concrete structures	3	0	0	3
3	19155E75C	Construction planning and scheduling	3	0	0	3
4	19155E75D	Municipal solid waste management	3	0	0	3
5	19155E75E	Pavement Engineering	3	0	0	3
6	19155E75F	Environmental and Social Impact Assessment	3	0	0	3
7	19155E75G	Water Resources Systems Engineering	3	0	0	3

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**SEMESTER – VIII
ELECTIVE IV**

S. No	Sub. Code	Name of the Subject	L	T	P	C
1	19155E81A	Coastal Engineering	3	0	0	3
2	19155E81B	Integrated water resources management	3	0	0	3
3	19155E81C	Groundwater engineering	3	0	0	3
4	19155E81D	Hydrology and water resources Engineering	3	0	0	3
5	19155E81E	Computer Aided Design of Structures	3	0	0	3
6	19155E81F	Total station and GPS Surveying	3	0	0	3
7	19155E81G	Traffic Engineering and Management	3	0	0	3

ELECTIVE V

S. No	Sub. Code	Name of the Subject	L	T	P	C
1	19155E82A	Maintenance, repair and rehabilitation of structures	3	0	0	3
2	19155E82B	Structural dynamics and earthquake engineering	3	0	0	3
3	19155E82C	Prefabricated structures	3	0	0	3
4	19155E82D	Bridge engineering	3	0	0	3
5	19155E82E	High Rise Structures	3	0	0	3
6	19155E82F	Remote Sensing	3	0	0	3
7	19155E82G	Tall Structures	3	0	0	3

OPEN ELECTIVE-I

1	19150FE54A	Database Management Systems (CSE)	3	0	0	3
2	19150FE54B	Cloud Computing (CSE)	3	0	0	3
3	19152FE54A	Basic Of Bio Medical Instrumentation (ECE)	3	0	0	3
4	19152FE54B	Sensor and Transducers (ECE)	3	0	0	3
5	19153FE54A	Industrial Nano Technology (EEE)	3	0	0	3
6	19153FE54A	Energy Conservation and Management (EEE)	3	0	0	3
7	19154FE54A	Renewable Energy Sources (MECH)	3	0	0	3
8	19154FE54B	Automotive Systems (MECH)	3	0	0	3


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OPEN ELECTIVE-II

1	19150FE74A	Introduction to C Programming (CSE)	3	0	0	3
2	19150FE74B	Data Structures & Algorithms (CSE)	3	0	0	3
3	19152FE74A	Robotics (ECE)	3	0	0	3
4	19152FE74B	Electronic Devices (ECE)	3	0	0	3
5	19153FE74A	Basic Circuit Theory (EEE)	3	0	0	3
6	19153FE74B	Introduction to Renewable Energy Systems (EEE)	3	0	0	3
7	19154FE74A	Industrial Safety (MECH)	3	0	0	3
8	19154FE74B	Testing of Materials (MECH)	3	0	0	3


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B.Tech-Civil Engineering – Part Time-2019R

SEMESTER – I

S. No	Sub. Code	Name of the Subject	L	T	P	C
1	19148S11P	Transforms & Partial Differential Equations	3	1	0	4
2	19155C12P	Mechanics of Solids	3	1	0	4
3	19155C13P	Fluid Mechanics I	3	1	0	4
4	19155C14P	Surveying	3	1	0	4
5	19155C15P	Irrigation Engineering	3	0	0	3
TOTAL						19

SEMESTER – II

S. No	Sub. Code	Name of the Subject	L	T	P	C
1	19148S21P	Numerical Methods	3	1	0	4
2	19155C22P	Strength of Materials	3	1	0	4
3	19155C23P	Fluid Mechanics II	3	1	0	4
4	19155C24P	Concrete Technology	3	1	0	4
5	19155C25P	Soil Mechanics	3	0	0	3
TOTAL						19

SEMESTER – III

S. No	Sub. Code	Name of the Subject	L	T	P	C
1	19148S31P	Probability & Statistics	3	1	0	4
2	19155C32P	Design of Reinforced Concrete Structures-I	3	1	0	4
3	19155C33P	Structural Analysis I	3	1	0	4
4	19155C34P	Construction Materials And Practice	3	0	0	3
5	19155L35P	Soil Mechanics Laboratory	0	0	3	2
TOTAL						17

SEMESTER – IV

S. No	Sub. Code	Name of the Subject	L	T	P	C
1	19155C41P	Design of Reinforced Concrete Structures-II	3	1	0	4
2	19155C42P	Structural Analysis II	3	1	0	4
3	19155C43P	Environmental Engineering	3	1	0	4
4	19155E44-P	Hard Core Elective I	3	1	0	4
5	19155L45P	Environmental Engineering Lab	0	0	3	2
TOTAL						18

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SEMESTER - V

S. No	Sub. Code	Name of the Subject	L	T	P	C
1	19155C51P	Design of Steel Structures	3	1	0	4
2	19155C52P	Foundation Engineering	3	1	0	4
3	19155C53P	Industrial Waste Management	3	1	0	4
4	19155E54-P	Hard Core Elective II	3	1	0	4
5	19155L55P	Computer Aided Building Drawing Laboratory	0	0	3	2
						18

SEMESTER - VI

S. No	Sub. Code	Name of the Subject	L	T	P	C
1	19155C61P	Estimation & Cost Evaluation	3	1	0	4
2	19155C62P	Ground Water Hydrology	3	1	0	4
3	19155C63P	Construction Project Management	3	1	0	4
4	19155E64-P	Hard Core Elective III	3	1	0	4
5	19155L65P	Concrete & Transportation Engineering Laboratory	0	0	3	2
TOTAL						18

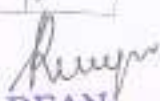
SEMESTER - VII

S. No	Sub. Code	Name of the Subject	L	T	P	C
1	19160S71P	Total Quality Management	3	0	0	3
2	19155C72P	Housing, Planning & Management	3	1	0	4
3	19155C73P	Repair And Rehabilitation of Structures	3	1	0	4
4	19155E74-P	Hard Core Elective IV	3	0	0	3
5	19155P75P	Project Work	-	-	12	6
TOTAL						20

LIST OF ELECTIVES
HARD CORE ELECTIVE I

S. No	Sub.Code	Name of the Subject	L	T	P	C
1	19155E44AP	Hydrology	3	1	0	4
2	19155E44BP	Water Resource Engineering	3	1	0	4
3	19155E44CP	Building Technology	3	1	0	4
4	19155E44DP	Contract Laws And Regulations	3	1	0	4
5	19155E44EP	Advanced Surveying	3	1	0	4
6	19155E44FP	Geo-Informatics Applications for Civil Engineers	3	1	0	4
7	19155E44GP	Ground Improvement Techniques	3	1	0	4


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HARD CORE ELECTIVE II

S. No	Sub.Code	Name of the Subject	L	T	P	C
1	19155E54AP	Computer Aided Analysis And Design	3	1	0	4
2	19155E54BP	Transportation Engineering	3	1	0	4
3	19155E54CP	Geology	3	1	0	4
4	19155E54DP	Highway Engineering	3	1	0	4
5	19155E54EP	Rock Engineering	3	1	0	4
6	19155E54FP	Introduction to soil dynamics and machine foundation	3	1	0	4
7	19155E54GP	Traffic engineering and management	3	1	0	4

HARD CORE ELECTIVE III

S. No	Sub.Code	Name of the Subject	L	T	P	C
1	19155E64AP	Remote Sensing And GIS	3	1	0	4
2	19155E64BP	Railway Engineering	3	1	0	4
3	19155E64CP	Airport & Harbours	3	1	0	4
4	19155E64DP	Electronic Surveying	3	1	0	4
5	19155E64EP	Construction planning and scheduling	3	1	0	4
6	19155E64FP	Municipal solid waste management	3	1	0	4
7	19155E64GP	Coastal Engineering	3	1	0	4

HARD CORE ELECTIVE IV

S. No	Sub.Code	Name of the Subject	L	T	P	C
1	19155E74AP	Air Pollution Management	3	0	0	3
2	19155E74BP	Prefabricated Structures	3	0	0	3
3	19155E74CP	Bridge Structures	3	0	0	3
4	19155E74DP	Prestressed Concrete Structures	3	0	0	3
5	19155E74EP	Integrated water resources management	3	1	0	4
6	19155E74FP	Bridge engineering	3	1	0	4
7	19155E74GP	Remote Sensing	3	1	0	4


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M.Tech-Structural Engineering – Full Time-2019R

SEMESTER – I


S. No	Subject Code	Name of the Subject	L	T	P	C
1	19248S11E	Advanced Engineering Mathematics	3	1	0	4
2	19255H12	Quality Control & Assurance in Construction	3	0	0	3
3	19255H13	Theory of Plasticity and Elasticity	3	1	0	4
4	19255H14	Structural Dynamics	3	1	0	4
5	19255H15	Maintenance and Rehabilitation of Structures	3	1	0	4
6	19255E16	Hard Core Elective I	3	1	0	4
7	19255CRS	Research Led Seminar	4	0	0	1
8	19255L18	Core Practical (Computer Programming Lab)	0	0	3	3
TOTAL						27

SEMESTER – II

S. No	Subject Code	Name of the Subject	L	T	P	C
1	19255H21	Management Information System	3	0	0	1
2	19255H22	Finite Element Analysis	3	1	0	4
3	19255H23	Advanced Concrete Structural Design	3	1	0	4
4	19255E24	Hard Core Elective - II	3	0	0	3
5	19255E25	Hard Core Elective - III	3	1	0	4
6	19255CRM	Research Methodology	4	0	0	1
7	19255CBR	Participation in Bounded Research	1	0	0	2
8	19255L28	Core practical (Software Lab - Finite Element Analysis- ANSYS)	0	0	3	3
9	192TECWR	Technical writing / Seminars	0	0	3	3
TOTAL						29

SEMESTER – III

S. No	Subject Code	Name of the Subject	L	T	P	C
1	19255H31	Advanced Steel Structures	3	1	0	4
2	19255E32	Hard Core Elective IV	3	1	0	4
3	19255E33	Hard Core Elective V	3	1	0	4
4	19255E34	Hard Core Elective VI	3	1	0	4
5	19255CSR	Design Project / Socio Technical Project	4	0	0	4
6	19255P36	Project Work Phase-I	0	0	9	9
TOTAL						29


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SEMESTER - IV

S. No	Subject Code	Name of the Subject	L	T	P	C
1	19255P4I	Project Work Phase-II	0	0	15	15
TOTAL						15

LIST OF ELECTIVES

SEMESTER I

Hard Core Elective-I

S. No	Subject Code	Name of the Subject	L	T	P	C
1	19255E16A	Prestressed Concrete Design	3	1	0	4
2	19255E16B	High Rise Structures	3	1	0	4
3	19255E16C	Computer Aided Structural Design	3	1	0	4
4	19255E16D	Structural Health Monitoring	3	1	0	4
5	19255E16E	Design of Masonry Structures	3	1	0	4

SEMESTER II

Hard Core Elective - II

S. No	Subject Code	Name of the Subject	L	T	P	C
1	19255E24 A	Failure Analysis of Structures	3	1	0	4
2	19255E24 B	Advanced Concrete Technology	3	0	0	3
3	19255E24 C	Steel Concrete Composite Structures	3	1	0	4
4	19255E24 D	Reliability Analysis of Structures	3	1	0	4
5	19255E24 E	Design of Industrial Structures	3	1	0	4

Hard Core Elective - III

S. No	Subject Code	Name of the Subject	L	T	P	C
1	19255E25A	Optimization in Structural Design	3	1	0	4
2	19255E25B	Design of Industrial Structures	3	1	0	4
3	19255E25 C	Elements of Earthquake Engineering	3	1	0	4
4	19255E25 D	Mechanics of Fiber Reinforced Polymer Composite Materials	3	1	0	4
5	19255E25 E	Performance of Structures with Soil Structure Interaction	3	1	0	4

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SEMESTER III
Hard Core Elective-IV


S. No	Subject Code	Name of the Subject	L	T	P	C
1	19255E32A	Experimental Stress Analysis	3	1	0	4
2	19255E32B	Soil Structure Interaction	3	1	0	4
3	19255E32C	Seismic Design of Structures	3	1	0	4
4	19255E32D	Design of Footwork	3	1	0	4
5	19255E32E	Matrix Methods for Structural Analysis	3	1	0	4

Hard Core Elective - V

S. No	Subject Code	Name of the Subject	L	T	P	C
1	19255E33A	Prefabricated Structures	3	1	0	4
2	19255E33B	Disaster Resistant Structures	3	1	0	4
3	19255E33C	Nonlinear Analysis of Structures	3	1	0	4
4	19255E33D	Energy Efficient Buildings	3	1	0	4
5	19255E33E	Advanced Prestressed Concrete	3	1	0	4

Hard Core Elective - VI

S. No	Subject Code	Name of the Subject	L	T	P	C
1	19255E34A	Offshore Structures	3	1	0	4
2	19255E34B	Stability of Structures	3	1	0	4
3	19255E34C	Mechanics of Composite Materials	3	1	0	4
4	19255E34D	Design of Steel Concrete Composite Structures	3	1	0	4
5	19255E34E	Design of Shell and Spatial Structures	3	1	0	4


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M.Tech-Structural Engineering – Part time-2019R

SEMESTER-I

S.No	Sub.Code	Name of the Subject	L	T	P	C
1	19248S11EP	Advanced Engineering Mathematics	3	1	0	4
2	19255C12P	Quality Control & Assurance in Construction	3	1	0	4
3	19255C13P	Theory of Plasticity and Elasticity	3	1	0	4
4	19255L14P	Computer Programming Lab	0	0	3	3
5	19255CRSP	Research Led Seminar	4	0	0	1
TOTAL						16

SEMESTER-II

S.No	Sub.Code	Name of the Subject	L	T	P	C
1	19255C21P	Management Information System	3	1	0	4
2	19255C22P	Finite Element Analysis	3	1	0	4
3	19255E23-P	Elective I-(ACT)	3	1	0	4
4	19255L24P	Software Lab- ANSYS	0	0	3	3
5	192TECWRP	Technical Writing/Seminars	0	0	3	3
6	19255CRMP	Research Methodology	4	0	0	3
7	19255CBRP	Participation in Bounded Research	1	0	0	2
TOTAL						23

SEMESTER-III

S.No	Sub.Code	Name of the Subject	L	T	P	C
1	19255C31P	Structural Dynamics	3	1	0	4
2	19255C32P	Maintenance and Rehabilitation of Structures	3	1	0	4
3	19255E33-P	Elective II	3	1	0	4
TOTAL						16

SEMESTER-IV

S.No	Sub.Code	Name of the Subject	L	T	P	C
1	19255C41P	Advanced Concrete Structural design	3	1	0	4
2	19255C42P	Advanced Steel Structures	3	1	0	4
3	19255E43-P	Elective III	3	1	0	4
4	19255P44P	Project Work Phase I	0	0	6	6
5	19255CSR	Design/Socio-Technical Project	4	0	0	4
Total Credits						18

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SEMESTER- V

S.No	Sub.Code	Name of the Subject	L	T	P	C
1	19255E51-P	Elective IV	3	1	0	4
2	19255E52-P	Elective V	3	1	0	4
3	19255E53-P	Elective VI	3	1	0	4
TOTAL						12

SEMESTER- VI

S.No	Sub.Code	Name of the Subject	L	T	P	C
1	19255P61P	Project Work Phase II	0	0	12	12
Total Credits						12

LIST OF ELECTIVES
SEMESTER II

Elective-I

S. No	Sub. Code	Name of the Subject	L	T	P	C
1	19255E23AP	Failure Analysis of Structures	3	1	0	4
2	19255E23BP	Advanced Concrete Technology	3	1	0	4
3	19255E23CP	Steel, Concrete Composite Structures	3	1	0	4
4	19255E23DP	Reliability Analysis of Structures	3	1	0	4
5	19255E23EP	Design of Industrial Structures	3	1	0	4

SEMESTER III

Elective- II

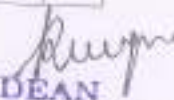
S. No	Sub. Code	Name of the Subject	L	T	P	C
1	19255E33AP	Prestressed Concrete Design	3	1	0	4
2	19255E33BP	High Rise Structures	3	1	0	4
3	19255E33CP	Computer Aided Structural Design	3	1	0	4
4	19255E33DP	Structural Health Monitoring	3	1	0	4
5	19255E33EP	Design of Masonry Structures	3	1	0	4

SEMESTER IV

Elective-III

S. No	Sub. Code	Name of the Subject	L	T	P	C
1	19255E43AP	Optimization In Structural Design	3	1	0	4
2	19255E43BP	Design Of Industrial Structures	3	1	0	4
3	19255E43CP	Elements Of Earthquake Engineering	3	1	0	4
4	19255E43DP	Mechanics of Fiber Reinforced Polymer Composite Materials	3	1	0	4
5	19255E43EP	Performance of Structures with Soil Structure Interaction	3	1	0	4


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SEMESTER V

Elective-IV


S. No	Sub. Code	Name of the Subject	L	T	P	C
1	19255E51AP	Experimental Stress Analysis	3	1	0	4
2	19255E51BP	Soil Structure Interaction	3	1	0	4
3	19255E51CP	A seismic Design Of Structures	3	1	0	4
4	19255E51DP	Design of Formwork	3	1	0	4
5	19255E51EP	Matrix Methods for Structural Analysis	3	1	0	4

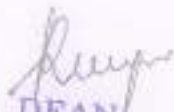
Elective-V

S. No	Sub. Code	Name of the Subject	L	T	P	C
1	19255E52AP	Prefabricated Structures	3	1	0	4
2	19255E52BP	Disaster Resistant Structures	3	1	0	4
3	19255E52CP	Nonlinear Analysis of Structures	3	1	0	4
4	19255E52DP	Energy Efficient Buildings	3	1	0	4
5	19255E52EP	Advanced Prestressed Concrete	3	1	0	4

Elective-VI

S. No	Sub. Code	Name of the Subject	L	T	P	C
1	19255E53AP	Offshore Structures	3	1	0	4
2	19255E53BP	Stability Of Structures	3	1	0	4
3	19255E53CP	Mechanics Of Composite Materials	3	1	0	4
4	19255E53DP	Design of Steel Concrete Composite Structures	3	1	0	4
5	19255E53EP	Design of Shell and Spatial Structures	3	1	0	4


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COURSE OBJECTIVES:

- To introduce concepts of Cartography.
- To expose the process of map making and production
- To introduce GIS data structures, data input and data presentation

UNIT I ELEMENTS OF CARTOGRAPHY

9

Definition of Cartography— Maps – Functions – Uses and Types of Maps – Map Scales and Contents – Map Projections – Shape, Distance, Area and Direction Properties – Perspective and mathematical Projections – Indian Maps and Projections – Map Co-ordinate System – UTM and UPS References.

UNIT II MAP DESIGN AND PRODUCTION

9

Elements of a Map—Map Layout Principles—Map Design Fundamentals—Symbols and Conventional Signs – Graded and Ungraded Symbols – Color Theory – Colours and Patterns in Symbolization – Map Lettering – Map Production – Map Printing – Colours and Visualization – Map Reproduction—Map Generalization—Geometric Transformations—Bilinear and Affine Transformations.

UNIT III DATA CAPTURE AND REPRESENTATION

9

Spatial data capture in raster and vector formats – texture data capture / creation – non-spatial data loggers and attributes – metadata design - data classes and graphics for metadata – graphics and maps – storage, warehousing and mining for automated mapping – graphic formats for visualization, communication and printing – 3D printing – compression and standards.

UNIT IV GEOVISUALIZATION

9

Flat maps and raised maps – terrain visualization – visualization of uncertainty – flow maps – virtual maps – simulated maps – mobile information and mobile maps – web mapping – widgets/dashboard.

UNIT V DIGITAL MAP MODELING

9

Map generalization – geo-statistics in generalization, and quantitative mapping – digital classification – contiguity and hierarchy in mapping – map models.

TOTAL: 45 PERIODS**COURSE OUTCOMES:**

- On completion of the course, the student is expected to
- CO1 Be familiar with appropriate map projection and co-ordinate system for production of Maps and shall able to compile and design maps for their required purpose.
- CO2 Be familiar with co-ordinate and Datum transformations.

TEXTBOOKS:

1. Arthur H. Robinson et al, "Elements of Cartography", 7th Edition, Wiley, 2002.
2. Kang—Tsun Chang, "Introduction to Geographic Information Systems", McGraw Hill Publishing, Fourth Edition, 2017.
3. Ian Heywood, Sarah Cornelias, Steve Carver, Srinivasa Raju, "An Introduction to Geographical Information Systems, Pearson Education, Fourth Edition, 2011.


B. Rajan
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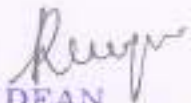
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REFERENCES:

1. John Campbell, "Introductory Cartography", Wm. C. Brown Publishers, 3rd Edition, 2004
2. Chor Pang LO, Albert K. W. Yeung, "Concepts and Techniques of Geographic Information Systems", Pearson Education, 2nd Edition, November 2016. ISBN: 9789332581883
3. Kraak M) and Ormeling (2010), *Cartography the visualization of spatial data*
4. Slocum et al. (2009), *Thematic cartography and Geovisualization*
5. Robinson, A.H. (1995), *Elements of cartography*
6. *Cartography: Visualization of geospatial Data* by Menno-Jan Kraak, Ferjan Ormeling, Pearson Education Limited 2003


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COURSE OBJECTIVE:

- Students mainly focused in understanding the offshore environment, types, suitability, and design concepts of offshore structures as per the appropriate requirements.

UNIT I	INTRODUCTION TO OFFSHORE ENVIRONMENT	9
Ocean winds-characterization of wind regime-wind velocity profile, Ocean waves-wave parameters- Introduction to Airy's wave theory and its applications-brief about time and frequency domain analysis, brief introduction about ocean currents-tides, seaquakes, Ice environment, Ice-sea interactions.		
UNIT II	TYPES OF OFFSHORE STRUCTURES	9
Offshore Structures-need for offshore structures. Types of Offshore Structures -components - materials used-design parameters-suitable environment conditions -construction practices- drawbacks-EIA for Offshore structures.		
UNIT III	FORCES ON OFFSHORE STRUCTURES	9
Introduction- Permanent loads- operating loads. Environmental forces-wind force-wave force-current force-seaquake force-ice force. Force due to tides - Marine growth - Use of API RP 2A guidelines.		
UNIT IV	SUB MARINE PIPELINES AND RISERS	9
Pipeline elements-types of pipelines-laying method-materials. Pipe wall thickness verification. Pipeline stability. Design using DNV 81 code.		
UNIT V	ACCIDENTAL LOADS AND CORROSION	9
Fire, Blast and Collision-Behaviour of steel at elevated temperature-Fixating for Hydrocarbon fire, Blast Mitigation-Blast walls-Collision of boats and energy absorption-Corrosion-Corrosion mechanism- Types of corrosion-Offshore structure corrosion zones-Biological corrosion- Preventive measures of corrosion- Online corrosion monitoring- Corrosion litigation		

TOTAL: 45 PERIODS**COURSE OUTCOMES:**

- On completion of the course, the student is expected to be able to
- CO1 Understand the offshore environment and technical terms associated with it.
- CO2 Explain the types and choose suitable offshore structures according to environmental conditions
- CO3 Investigate various types of forces acting on the offshore structures
- CO4 Adapt appropriate codes to design the submarine pipelines
- CO5 Discuss about the accidental loads and corrosion on offshore structures

REFERENCES:

1. Graff, W.J., Introduction to Offshore Structures, Gulf Publ. Co. 1981.
2. Dawson, T.H., Offshore Structural Engineering, Prentice Hall, 1983.
3. B.C Gerwick, Jr. Construction of Marine and Offshore Structures, CRC Press, Florida, 2000.
4. Clauss, G., Lehmann, E. & Ostergaard, C., Offshore Structures, Vol. 1 & 2, Springer-Verlag, 1992.
5. Reddy, D.V and Arockiasamy M., Offshore Structures Vol. 1 & 2, Kreiger Publ. Co. 1991.
6. Morgan, N., Marine Technology Reference Book, Butterworths, 1990
7. Mc Clelland, B and Reifel, M.D., Planting and Design of fixed Offshore Platforms, Van Nostrand, 1986.
8. DNV-RP-B101-Corrosion Protection of Floating Protection and Storage Units, 2007.
9. API RP 2A Planning, Designing and Constructing Fixed Offshore Platforms, API 2000



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COURSE OBJECTIVE:

Failure analysis is an investigation to determine the cause of a failure, usually with the goal of preventing future failures.

UNIT - 1

Causes of failure – Types of failure – why, what, how – durability of materials – Landmark case – Performance and shape inadequacy – statistics and reliability – life cycle assessment.

UNIT - 1

Structural failure – material and load effects – environment effect – Non-structural and structural repairs – Biocide treatment and use of preservatives – deterioration of wood.

UNIT - 2

Macro micro level failures – component and sub-system failures – failure theories – analytical models – cases and type of problem in components – safety evaluation.

UNIT - 3

Structural systems case studies – pin-jointed steel systems – rigid jointed frames – concrete walls arches – reinforced concrete beams and frames.

UNIT - 4

shells – repair of concrete bridge and water retaining structures – Bridge maintenance techniques.

UNIT - 5

The refurbishment of buildings, legal responsibilities – Case studies – Definition of smartness – sensors – automatic and adaptive systems – smart components

COURSE OUTCOMES:

- On completion of the course, the student is expected to be able to
- CO1 Understand the modern construction techniques used in the sub structure construction.
- CO2 Demonstrate knowledge and understanding of the principles and concepts relevant to superstructure construction for buildings
- CO3 Understand the concepts used in the construction of special structures
- CO4 Knowledge on Various strengthening and repair methods for different cases.
- CO5 Identify the suitable demolition technique for demolishing a building.

TEXT BOOKS:

1. Rueger, J.M. Electronic Distance Measurement, Springer-Verlag, Berlin, 4th Edition, 1996.
2. SatheshGopi, rasathishkumar, Namadhu, — Advanced Surveying , Total Station GPS and Remote Sensing — Pearson education , 2nd Edition, 2017.

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3. Gunter Seiber, Satellite Geodesy, Walter De Gruyter, Berlin, 2nd Edition, 2003

REFERENCES:

1. Rasnom, W.H., Building Failures, E&F, N. SPON Ltd., 1980.
2. Moskvyn V, Concrete and Reinforced Structures – Deterioration and Protection, Mir Publishers, Moscow, 1980.

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COURSE OBJECTIVE:

- To study and understand the latest construction techniques applied to engineering construction for sub structure, super structure, special structures, rehabilitation and strengthening techniques and demolition techniques.

UNIT - 1

Engineering seismology – rebound theory – plate tectonics – seismic waves – earthquake size and various scales – local site effects – Indian seismicity – seismic zones of India – theory of vibration – near ground and far ground rotation and their effects.

UNIT - 2

Seismic design concepts – EQ load on simple buildings – load path – floor and roof diaphragms – seismic resistant building architecture – plan configuration – vertical configuration – pounding effects – mass and stiffness irregularities – torsion in structural system.

UNIT - 3

Provision of seismic code (IS1893 & IS 13920) – Building systems – frames – shear wall – braced frame – layout design of Moment Resisting Frames (MRF) – ductility of MRF – Infill walls – Non-structural elements.

UNIT - 4

Calculation of EQ load – 3D modeling of building systems and analysis (theory only) Design and detailing of frames, shear wall, and frame walls.

UNIT - 5

Cyclic loading behavior of RC steel and pre-stressed concrete elements - modern concepts - base isolation – Adaptive systems – case studies

COURSE OUTCOMES:

On completion of the course, the student is expected to be able to:

- CO1 Define the economic aspects and analysis of water resources systems for comprehensive and integrated planning of a water resources project.
- CO2 Apply the concept of linear programming for optimisation of water resources problems.
- CO3 Explain the concept of dynamic programming and apply in water resource system.
- CO4 Develop the simulation model based on deterministic and stochastic simulation for reservoir operating policy
- CO5 Apply advance optimisation techniques like goal programming, heuristic algorithm in the field of water resources planning and management.


TEXT BOOKS

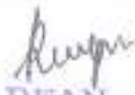
- Vedala, S., and Majumdar, P.P. Water Resources Systems – Modeling Techniques and Analysis Tata McGraw Hill, New Delhi, Fifth reprint, 2010

2. Bhawe PR, Water Resources Systems, Narosa Publishers,2011

References

1. Pankaj Agarwal and Manish Shrikhande, Earthquake Resistant Design of Structures, Prentice- Hall of India, 2007, New Delhi
2. Bullen K.E., Introduction to the Theory of Seismology, Great Britain at the University Printing houses, Cambridge University Press 1996.
3. Relevant code of practices.


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COURSE OBJECTIVES:

- To impart knowledge on the concept and application of Industrial pollution prevention, cleaner technologies, industrial wastewater treatment and residue management.
- Understand principles of various processes applicable to industrial wastewater treatment
- Identify the best applicable technologies for wastewater treatment from the perspective of yield production.

UNIT I INTRODUCTION

8

Industrial scenario in India– Industrial activity and Environment - Uses of Water by industry – Sources and types of industrial wastewater – Nature and Origin of Pollutants - Industrial wastewater and environmental impacts – Regulatory requirements for treatment of industrial wastewater – Industrial waste survey – Industrial wastewater monitoring and sampling – generation rates, characterization and variables – Toxicity of industrial effluents and Bioassay tests – Major issues on water quality management.

UNIT II INDUSTRIAL POLLUTION PREVENTION & WASTE MINIMISATION

8

Prevention vis a vis Control of Industrial Pollution – Benefits and Barriers – Waste management Hierarchy - Source reduction techniques – Periodic Waste Minimisation Assessments - Evaluation of Pollution Prevention Options – Cost benefit analysis – Pay-back period – Implementing & Promoting Pollution Prevention Programs in Industries.

UNIT III INDUSTRIAL WASTEWATER TREATMENT

10

Flow and Load Equalisation – Solids Separation – Removal of Fats, Oil & Grease- Neutralisation-Removal of Inorganic Constituents – Precipitation, Heavy metal removal, Nitrogen & Phosphorus removal, Ion exchange, Adsorption, Membrane Filtration, Electro dialysis & Evaporation –Removal of Organic Constituents – Biological treatment Processes, Chemical Oxidation Processes, Advanced Oxidation processes – Treatability Studies.

UNIT IV WASTEWATER REUSE AND RESIDUAL MANAGEMENT

9

Individual and Common Effluent Treatment Plants – Joint treatment of industrial and domestic wastewater - Zero effluent discharge systems - Quality requirements for Wastewater reuse Industrial reuse, Present status and issues - Disposal on water and land – Residuals of industrial wastewater treatment – Quantification and characteristics of Sludge – Thickening, digestion, conditioning, dewatering and disposal of sludge – Management of RO rejects.

UNIT V CASE STUDIES

10

Industrial manufacturing process description, wastewater characteristics, source reduction options and waste treatment flow sheet for Textiles – Tanneries – Pulp and paper – metal finishing – Sugar and Distilleries

**TOTAL: 45
PERIODS****COURSE OUTCOMES:**

After completion of this course, the students is expected to be able to,
 CO-1: Explain the source and types of industrial wastewater and their environmental impact and choose the regulatory laws pertaining to environmental protection.

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- CO2 Identify industrial wastewater pollution and implement pollution prevention, wasteminimization in industries
- CO3 Apply knowledge and skills to design industrial wastewater treatment schemes
- CO4 Audit and analyze environmental performance of industries to internal, external client, regulatory bodies and design water reuse management techniques
- CO5 Conduct research to develop effective management systems for industrial wastewater that are technically sound, economically feasible and socially acceptable

Text Books:

1. Timoshenko, S.P., and Gere, J.M., *Theory of Elastic Stability*, McGrawHill Book Company, 1963.

REFERENCES:

1. "Industrial wastewater management, Treatment & disposal, Water Environment" Federation Alexandria Virginia, Third Edition, 2008.
2. Lawrence K. Wang, Yung Tse Hung, Howard H. Lo and Constantine Yapijakis "handbook of Industrial and Hazardous waste Treatment", Second Edition, 2004.
3. Metcalf & Eddy, Inc., George Tchobanoglous, Franklin L. Burton and H. David Stensel, Wastewater engineering, treatment and reuse, Fourth Edition, McGraw-Hill, 2017
4. Nelson Leonard Nemerow, " industrial waste Treatment", Elsevier, 2007.
5. Wesley Eckenfelder W., " Industrial Water Pollution Control", Second Edition, Mc Graw Hill, 2000.
6. Paul L. Bishop, Pollution Prevention: - Fundamentals and Practice', Mc-Graw Hill International, Boston, 2000.
7. Waste water Treatment for pollution control and reuse by Sofi, J. Arceivala, Shyam, R. Awolokuz, Tata McGraw Hill, 2007



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COURSE OBJECTIVE:

- To illustrate the major problems in air pollution and control.
- To describe the air pollution control measures and devices.
- To impart basic knowledge on noise pollution control.

UNIT I INTRODUCTION TO AIR QUALITY 9

An Overview of the Clean Air Act Amendments; Fate and Transport in the Environment; Priority Air Pollutants; Indoor Air Quality Properties of Air Pollutants; Selected Chemical and Physical Properties of Potential Atmospheric Pollutants; Basic Properties and Terminology;

UNIT II INDUSTRIAL AIR POLLUTION SOURCES AND PREVENTION 9

Air Pollution in the Chemical Process, Petroleum, Iron and Steel Manufacturing, Lead and Zinc Smelting Industries, Air Pollution from Nickel Ore Processing and Refining; Air Pollution from Aluminum Manufacturing; Air Pollution from Copper Smelting;

UNIT III VENTILATION AND INDOOR AIR QUALITY CONTROL 9

An Overview of Indoor Air Quality; The Basics of HVAC Systems; IAQ Issues and Impacts on Occupants; Application of Audits to Developing an IAQ Profile; Developing Management Plans; IAQ Problems; Control; Quantification and Measurement, Air Pollution Dispersion-Dispersion Theory Basics; Air Quality Impact of Stationary Sources- Models and Resources.

UNIT IV PREVENTION VERSUS CONTROL 9

Pollution Prevention: Principles of Pollution Prevention; Methods of Particulate Collection; Methods for Cleaning Gaseous Pollutants, Environmental Cost Accounting; Total Cost Accounting Terminology;

UNIT V NOISE POLLUTION 9

Sound level-measuring transient noise-acoustic environment-health effects of noise--noise control. Introduction to cosmic pollution


TOTAL:45 PERIODS


COURSE OUTCOME:

- Be familiar with air pollution remedial measures and their importance.
- The students will undertake projects related to air pollution control.

REFERENCES

1. Arjaneyulu, Y, 'Air Pollution and Control Technologies', Allied Publishers (P) Ltd., India, 2003.


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2. Arthur C. Stern, 'Air Pollution (Vol. I - Vol. VIII)', Academic Press, 2006.
3. David H. F. Liu, Bela G. Liptak 'Air Pollution', Lewis Publishers, 2000.
4. Heck, R. M. and Farauto, R. J., Catalytic Air Pollution Control: Commercial Technology, 2nd Edition John Wiley Sons, 2012
5. Jeffrey Pierce, Environmental Pollution and Control, Butterworth-Heinemann, 4th edn, 1997.
6. Lawrence K. Wang, Norman C. Pareira, Yung Tse Hung, Air Pollution Control Engineering, Tokyo, 2004.
7. Noelde Nevers, Air Pollution Control Engineering, McGraw Hill, New York, 2011.
8. Wayne T. Davis, 'Air Pollution Engineering Manual', John Wiley & Sons, Inc., 2000.

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STABILITY OF STRUCTURES

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COURSE OBJECTIVES

To ensure that a structure can resist all applied loads during its intended life, and to prevent it from sliding, overturning, or buckling.

UNIT I

(10 Lectures)

BUCKLING OF COLUMNS

States of equilibrium - Classification of buckling problems - concept of equilibrium, energy, imperfection and vibration approaches to stability analysis - Eigenvalue problem, governing equation for columns - Analysis for various boundary conditions using Equilibrium, Energy methods. Approximate methods-Rayleigh Ritz, Galerkin's approach-Numerical Techniques -Finite difference method-Effect of shear on buckling

UNIT II

(10 Lectures)

BUCKLING OF BEAM – COLUMNS AND FRAMES

Theory of beam column - Stability analysis of beam column with single and several concentrated loads, distributed load and end couples, Analysis of rigid joint frames with and without sway - Use of stability function to determine the critical load.

UNIT III

(10 Lectures)

TORSIONAL AND LATERAL BUCKLING

Torsional buckling - Combined Torsional and flexural buckling - Local buckling Buckling of Open Sections, Numerical solutions. Lateral buckling of beams, pure bending of simply supported and cantilever beams. Concept of warping

UNIT IV

(10 Lectures)

BUCKLING OF PLATES

Governing differential equation - Buckling of thin plates, four side conditions -Analysis by equilibrium and energy approach - Finite difference method.

UNIT V

(10 Lectures)

INELASTIC BUCKLING

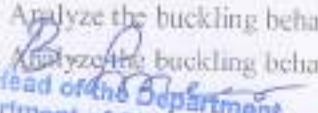
Double modulus theory - Tangent modulus theory - Shanley's model - Eccentrically loaded inelastic column, Inelastic buckling of plates - Post buckling behaviour of plates.

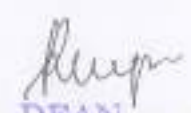
COURSE OUTCOMES:

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

CO1 Analyze the buckling behavior of columns.

CO2 Analyze the buckling behavior of framed structures.


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- CO3 Analyze the lateral torsional buckling of flexural members.
CO4 Analyze the buckling of plates.
CO5 Analyze the in elastic buckling of column and plates.

Text Books:

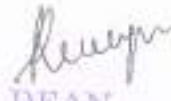
1. Timoshenko, S.P., and Gere, J.M., *Theory of Elastic Stability*, McGrawHill Book Company, 1963.
2. Cluges, A. *Principles of Structures Stability Theory*, Prentice Hall, 1974.

References:

1. Ashwini Kumar, *Stability Theory of Structures*, Allied publishers Ltd., New Delhi, 2003.
2. Gambhir, *Stability Analysis and Design of Structures*, Springer, New York, 2004.
4. Simitser, G.J and Hodges D.H, *Fundamentals of Structural Stability*, Elsevier Ltd., 2006.



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COURSE OBJECTIVE

This course deals with some of the special aspects with respect to Civil Engineering structures in industries. At the end of this course the student shall be able to design some of the structures.

UNIT 1 PLANNING

9

Classification of Industries and Industrial structures –
General requirements for industries like cement, chemical and steel plants – Planning and layout of buildings and components.

UNIT – 2 FUNCTIONAL REQUIREMENTS

9

Lighting – Ventilation – Accounts – Fire safety – Guidelines from factories act.

UNIT – 3 DESIGN OF STEEL STRUCTURES

9

Industrial roofs – Crane girders – Mill buildings – Design of Bunkers and Silos

UNIT – 4 DESIGN OF R.C. STRUCTURES

9

Silos and bunkers – Chimneys – Principles of folded plates and shell roofs

UNIT – 5 PREFABRICATION

9

Principles of prefabrication – Prestressed precast roof trusses – Functional requirements for Precast concrete units

TOTAL : 45**COURSE OUTCOMES:**

- Reliability engineering: Developing an awareness of reliability engineering for structure safety
- Statistics and probability: Acquiring knowledge of statistics and probability for reliability analysis

TEXT BOOKS

1. Reinforced Concrete Structural elements – P. Parushothaman
2. Pasala Dayaratnam – Design of Steel Structure – 1990

REFERENCES

1. Henn W. Buildings for Industry, vols.I and II, London Hill Books, 1995
2. Handbook on Functional Requirements of Industrial buildings, SP32 – 1986, Bureau of Indian Standards, New Delhi 1990
3. Course Notes on Modern Developments in the Design and Construction of Industrial Structures, Structural Engineering Research Centre, Madras, 1982


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COURSE OBJECTIVE:

- Student gains knowledge on various IRC guidelines for designing rigid and flexible pavements. Further, the student will be in a position to assess quality and serviceability conditions of roads.

UNIT I PAVEMENT MATERIALS AND SUBGRADE ANALYSIS

8

Introduction – Pavement as layered structure – Pavement types -rigid and flexible-Subgrade analysis- Stress and deflections in pavements- Pavement Materials and Testing- Modified Binders.

UNIT II DESIGN OF FLEXIBLE PAVEMENTS

10

Flexible pavement design – Advantages and disadvantages -Factors influencing design of flexible pavement, Empirical – Mechanistic empirical and theoretical methods – Design procedure as per IRC guidelines – Design and specification of rural roads.

UNIT III DESIGN OF RIGID PAVEMENTS

9

Cement concrete pavements Factors influencing CC pavements – Modified Westergaard approach – Design procedure as per IRC guidelines – Concrete roads and their scope in India.

UNIT IV PAVEMENT CONSTRUCTION, EVALUATION AND MAINTENANCE

10

Construction Techniques practice of flexible and concrete pavement Pavement Evaluation - Causes of distress in rigid and flexible pavements – Evaluation based on Surface Appearance, Cracks, Patches and Pot Holes, Undulations, Raveling, Roughness, Skid Resistance, Structural Evaluation by Deflection Measurements - Pavement Serviceability index, - Pavement maintenance (IRC Recommendations only).

UNIT V STABILIZATION OF PAVEMENTS

8

Stabilization with special reference to highway pavements – Choice of stabilizers – Testing and field control - Stabilization for rural roads in India – Use of Geosynthetics in roads.

TOTAL: 45 PERIODS**COURSE OUTCOMES**

- CO1 Get knowledge about types of rigid and flexible pavements.
 CO2 Able to design of rigid pavements
 CO3 Able to design of flexible pavements.
 CO4 Determine the causes of distress in rigid and flexible pavements.
 CO5 Understand stabilization of pavements, testing and field control.

TEXTBOOKS:


1. Khanna, S.K. and Justo C.E.G. and Veeraragavan, A. "Highway Engineering", New Chand and Brothers, Revised 10th Edition, 2014.
2. Kadiyali, L.R., "Principles and Practice of Highway Engineering", Khannatech. Publications, New Delhi, 2015.

REFERENCES:

1. Yoder, R.J. and Witchak M.W. "Principles of Pavement Design", John Wiley 2000.
2. Guidelines for the Design of Flexible Pavements, IRC:37-2012, The Indian roads Congress, New Delhi.
3. Guideline for the Design of Rigid Pavements for Highways, IRC 58-2018, The Indian Road Congress, New Delhi.


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COURSE OBJECTIVES:

- 1) To expose the students to the need, methodology, documentation and usefulness of environmental impact assessment and to develop the skill to prepare environmental management plan
- To participate in the performance of an environmental assessment process (EIA or SEA), given the disciplinary knowledge and skills in natural sciences and engineering the student have achieved in other courses.

UNIT I	INTRODUCTION	9
Historical development of Environmental Impact Assessment (EIA). Environmental Clearance- EIA in project cycle. legal and regulatory aspects in India – types and limitations of EIA –EIA process screening – scoping - terms of reference in EIA- setting – analysis – mitigation. Cross sectoral issues –public hearing in EIA- EIA consultant accreditation.		
UNIT II	IMPACT IDENTIFICATION AND PREDICTION	10
Matrices – networks – checklists – cost benefit analysis – analysis of alternatives – expert systems in EIA. prediction tools for EIA – mathematical modelling for impact prediction – assessment of impacts – air – water – soil – noise – biological – cumulative impact assessment		
UNIT III	SOCIO-ECONOMIC IMPACT ASSESSMENT	8
Socio-economic impact assessment - relationship between social impacts and change in community and institutional arrangements. factors and methodologies- individual and family level impacts. communities in transition-rehabilitation		
UNIT IV	EIA DOCUMENTATION AND ENVIRONMENTAL MANAGEMENT PLAN	9
Environmental management plan - preparation, implementation and review – mitigation and rehabilitation plans – policy and guidelines for planning and monitoring programmes – post project audit – documentation of EIA findings – ethical and quality aspects of environmental impact assessment		
UNIT V	CASE STUDIES	9
Mining, power plants, cement plants, highways, petroleum refining industry, storage & handling of hazardous chemicals, common hazardous waste facilities, CETPs, CMSWMF, building and construction projects		

TOTAL: 45 PERIODS**COURSE OUTCOMES:**

On completion of the course, the student is expected to be able to

- CO1 carry out scoping and screening of developmental projects for environmental and social assessments
- CO2 explain different methodologies for environmental impact prediction and assessment
- CO3 asses socio-economic investigation of the environment in a project
- CO4 plan environmental impact assessments and environmental management plans
- CO5 knowledge to prepare environmental impact assessment reports for various projects

TEXT BOOKS:

- Rueger, J.M. Electronic Distance Measurement, Springer-Verlag, Berlin, 4th Edition, 1996.
- SatheshkGopi, rasathishkumar, N.madhu, — Advanced Surveying, Total Station GPS and

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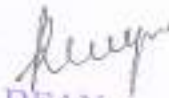
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REFERENCES:

1. Canter, L.W., "Environmental Impact Assessment", McGraw Hill, New York. 1996
2. Lawrence, D.P., "Environmental Impact Assessment - Practical solutions to recurrent problems", Wiley-Interscience, New Jersey. 2003
3. World Bank -Source book on EIA
4. Cutter, S.L., "Environmental Risk and Hazards", Prentice-Hall of India Pvt. Ltd., New Delhi, 1999.
5. Kolluru Rao, Bartell Steven, Pablado R and Stricoff "Risk Assessment and Management Handbook", McGraw Hill Inc., New York,1996.
6. K. V. Raghavan and A. A. Khan, "Methodologies in Hazard Identification and Risk Assessment", Manual by CLRI, 1990.



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WATER RESOURCES SYSTEMS ENGINEERING L T P C
3 0 0 3

COURSE OBJECTIVE:

- To introduce the student to the concept of Mathematical approaches for managing the water resources system and apply to operate a water resource system optimally.

UNIT I	SYSTEM APPROACH	9
Definition, classification, and characteristics of systems - Philosophy of modelling – Goals and Objectives – Basics of system analysis concept – steps in systems engineering.		
UNIT II	LINEAR PROGRAMMING	9
Introduction to Operation research - Linear programming Problem Formulation- graphical solution Simplex method –Sensitivity analysis - application to operation of single purpose reservoir		
UNIT III	DYNAMIC PROGRAMMING	9
Bellman's optimality criteria, problem formulation and solutions – Water Allocation for three state (user), Forward and Backward Recursion techniques in Dynamic Programming - Shortest pipe line route problem) - Application in reservoirs capacity expansion		
UNIT IV	SIMULATION	9
Basic principles and concepts – Monte Carlo techniques – Model development – Inputs and outputs – Single and multipurpose reservoir simulation models – Deterministic simulation – Rule Curve development for reservoir		
UNIT V	ADVANCED OPTIMIZATION TECHNIQUES	9
Integer and parametric linear programming – Goal programming types – Applications to reservoir release optimization – application of evolutionary algorithms like Genetic algorithm, Particle swarm, Simulated Annealing to reservoir release optimization		

TOTAL: 45 PERIODS

COURSE OUTCOMES:

On completion of the course, the student is expected to be able to:

- CO1** Define the economic aspects and analysis of water resources systems for comprehensive and integrated planning of a water resources project.
- CO2** Apply the concept of linear programming for optimisation of water resources problems.
- CO3** Explain the concept of dynamic programming and apply in water resource system.
- CO4** Develop the simulation model based on deterministic and stochastic simulation for reservoir operating policy
- CO5** Apply advance optimisation techniques like goal programming, heuristic algorithm in the field of water resources planning and management.

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TEXT BOOKS

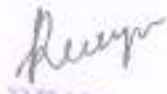
3. Vedula, S., and Majumdar, P.P. *Water Resources Systems — Modeling Techniques and Analysis* Tata McGraw Hill, New Delhi, Fifth reprint, 2010.
4. Bhave PR, *Water Resources Systems*, Narosa Publishers, 2011

REFERENCES:

1. Gupta, P.K., and Man Mohan. "Problems in Operations Research", (Methods and Solutions), Sultan Chand and Sons, New Delhi, 1995.
2. Chaturvedi, M.C., "Water Resources Systems Planning and Management", Tata McGraw Hill, New Delhi, 1997.
3. Taha, H.A., "Operations Research", McMillan Publication Co., New York, 1995.
4. Hiller, F.S., and Liebermann, G.J., "Operations Research", CBS Publications and Distributions, New Delhi, 1992.



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COURSE OBJECTIVE:

1. To provide an overview of how computers are being used in design, development of manufacturing plans and manufacture
2. Understand the Mathematical representations of curves and surfaces used in geometric construction.
3. Understand the Mathematical representations of solids used in geometric construction.
4. Understand the transformation of 2D and 3D parts
5. Understand the algorithm for visualization of various 2D and 3D parts

UNIT-I

Introduction: Computers in Industrial Manufacturing, Product cycle, CAD / CAM Hardware, Basic structure

Computer Graphics: Display Devices: Cathode Ray Tube, DVST, Raster display, pixel value and lookup table, estimation of graphical memory, LCD, LED fundamentals. Concept of Coordinate Systems, Working Coordinate System, Model Coordinate System, Screen Coordinate System. Graphics exchange standards and Database management systems.

UNIT-II

Curves and Surfaces: Introduction to curve representation, Classification of curves, Line generation algorithm: DDA and Curve generation algorithm: Bresenham's algorithm. Synthetic Curves: Concept of continuity, Cubic Spline: equation, properties and blending. Bezier Curve: equations, properties; Properties and advantages of B-Splines and NURBS. Various types of surfaces along with their typical applications.

UNIT-III

Mathematical representation of solids: Geometry and Topology, Comparison of wireframe, surface and solid models, Properties of solid model, properties of representation schemes, Concept of Half-spaces, Boolean operations, Schemes: B-rep, CSG, Sweep representation, ASM, Primitive instancing, Cell Decomposition and Octree encoding

UNIT-IV

Geometric Transformations: Homogeneous representation; Translation, Scaling, Reflection, Rotation, Shearing in 2D; Orthographic and perspective projections.

UNIT-V

VISUAL REALISM: Hidden - Line-Surface-Solid removal algorithms - shading - colouring - computer animation.

Course Outcomes:

1. Understand the applications of computer in the design and manufacturing.
2. Understand and develop the Mathematical representations of curves used in geometric construction.
3. Understand and develop the Mathematical representations of solids used in



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geometric construction.

Able to get the transformed in 2D and 3D using transformation

TEXT BOOKS:

1. CAD / CAM Theory and Practice / Ibrahim Zeid / TMH Publishers
2. CAD / CAM / A Zimmers & P. Groover / PE / PHI Publishers

REFERENCE BOOKS:

1. CAD / CAM / CIM / Radhakrishnan and Subramanian / New Age Publishers
2. Principles of Computer Aided Design and Manufacturing / Farid Amiroche / Pearson Edu
3. CAD/CAM: Concepts and Applications / Alavala / PHI Publishers Computer Numerical Control Concepts and programming / Warren S Seames / Thomson Publishers
4. CAD / CAM – P N RAO McGraw Hill Publications.



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COURSE OBJECTIVE:

- ☐ To understand the working of Total Station and GPS and solve the surveying problems.

UNIT I FUNDAMENTALS OF TOTAL STATION AND ELECTROMAGNETIC WAVES 9

Methods of Measuring Distance, Basic Principles of Total Station, Historical Development, Classifications, applications and comparison with conventional surveying - Applications of Electromagnetic waves. Propagation properties, wave propagation at lower and higher frequencies - Refractive index (RI) - factors affecting RI - Computation of group for light and near infrared waves at standard and ambient conditions - Computation of RI for microwaves at ambient condition - Reference refractive index - Real-time application of first velocity correction. Measurement of atmospheric parameters - Mean refractive index - Second velocity correction - Total atmospheric correction - Use of temperature - pressure, transducers.

UNIT II ELECTRO-OPTICAL AND MICROWAVE 9

Electro - optical system: Measuring principle, Working principle. Sources of Error, Infrared and Laser Total Station instruments.
 Microwave system: Measuring principle, working principle, Sources of Error, Microwave Total Station instruments. Comparison between Electro-optical and Microwave system. Care and maintenance of Total Station instruments.
 COGO functions: Area, Inverse / MLM, REM, Resection, offsets and stakeout - Land survey applications.

UNIT III SATELLITE SYSTEM 9

Basic concepts of GPS - Historical perspective and development - applications - Geoid and Ellipsoid
 - satellite orbital motion - Keplerian motion - Kepler's Law - Perturbing forces - Geodetic satellite - Doppler effect - Positioning concept - GNSS and IRNSS - SBAS: GAGAN and WAAS Different segments - space, control and user segments - satellite configuration - GPS signal structure - Orbit determination and representation - Anti Spoofing and Selective Availability - Task of control segment
 - GPS receivers.

UNIT IV GPS DATA PROCESSING 9

GPS observables - code and carrier phase observation - linear combination and derived observables
 - concept of parameter estimation - downloading the data - RINEX Format - Differential data processing - software modules - solutions of cycle slips, ambiguities - Multi path and other observational errors - satellite geometry and


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accuracy measures Continuously Operating Reference System (CORS)– long base line processing - use of different processing software's: OpenSource, Scientific and Commercial.

UNIT V SURVEYING METHODS AND APPLICATIONS

9

Total Station: Traversing and Trilateration measurement and adjustment -Planimetric map and Contour map and Topography Mapping.
GNSS: Concepts of rapid, static, semi-Kinematic, pure Kinematic and RTK methods.
Observation by Radiation, Levelling and Trilateration measurement and processing -
Topography mapping using PPK and RTK methods
Total Station and GNSS-applications

TOTAL:45
PERIODS

COURSE OUTCOMES:

- On completion of the course, the student is expected to
- CO1 Learn about the fundamental concept of Total station.
 - CO2 Provide knowledge about electromagnetic waves and its usage in Total station and GNSS.
 - CO3 Gain Knowledge on basic concepts of GNSS.
 - CO4 Understand the measuring and working principle of electro optical and Microwave Totalstation and GPS.
 - CO5 Gain knowledge about Total station and GNSS data processing and Mapping.

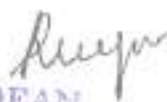
TEXT BOOKS:

- Roeger, J.M. Electronic Distance Measurement. Springer-Verlag, Berlin, 4th Edition, 1996.
- SatheeshGopi, rasathishkumar, Naraditu. — Advanced Surveying , Total Station GPS and Remote Sensing — Pearson education . 2nd Edition, 2017. isbn: 978-81317 00679.
- Gunter Seeber . Satellite Geodesy, Walter De Gruyter, Berlin, 2nd Edition, 2003

REFERENCES:

1. R.Subramanian, Surveying and Levelling, Oxford University Press, Second Edition, 2012.
2. Laurila, S.H. Electronic Surveying in Practice, John Wiley and Sons Inc, 1983
3. Guocheng Xu, GPS Theory, Algorithms and Applications, Springer - Verlag, Berlin, 3rd Edition, 2016.
4. Alfred Leick, GPS satellite surveying, John Wiley & Sons Inc., 4th Edition, 2015.


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COURSE OBJECTIVE

- To give an overview of Traffic engineering, various surveys to be conducted, traffic Regulation, management and traffic safety

UNIT I TRAFFIC SURVEYS AND ANALYSES

8

Traffic characteristics: Human, vehicular, and Pavement Characteristics, Problems- presentation of traffic volume data, Annual Average Daily Traffic, Average Daily Traffic, Design hourly traffic volume; Speed- spot speed, presentation of spot speed data, speed and delay studies, methods of conducting spot-speed studies and Speed and Delay studies; Problems Origin and Destination — methods of conducting the survey and presentation of data; parking surveys, presentation of data and analyses, determination of parking demand; Accident studies and analyses; Different problems.

UNIT II TRAFFIC FLOW AND ROADWAY CAPACITY

8

Traffic Flow Characteristics – Basic traffic manoeuvres, Traffic stream flow characteristics, Speed- Flow- Density Relations; Passenger Car Units – Mixed traffic flow and related issues – Concept of PCU value- Factors affecting PCU values- Recommended PCU values for different conditions; Capacity and Level of Service – Factors affecting practical capacity – Design Service Volumes

UNIT III COST – EFFECTIVE TRAFFIC MANAGEMENT TECHNIQUES

10

Traffic System Management: Regulatory Techniques- one way street, Reversible Street, Reversible lane, Turning moment restrictions, closing streets; Traffic Control Devices Traffic Signs – Road Markings, Traffic Signals, Miscellaneous traffic control devices; Traffic Segregation – Vehicle segregation, Pedestrian segregation, Traffic signals design; Bus Priority Techniques – Priority manoeuvres – With-flow bus lane and contra-flow bus lane; Self- Enforcing Techniques- Demand Management Techniques (TDM) Road pricing, parking control, Tolls, Staggering of office/educational institution hours.

UNIT DESIGN OF ROAD INTERSECTIONS

10

Importance and Classification; Intersections at-grade – uncontrolled, channelised; Rotary Intersections (problems)- Signalled intersections (problems)- Grade Separated Intersections – merits and demerits, types, pattern of intersections with different types of interchanges- Capacity, Concept diagrams.

UNIT V DESIGN OF PARKING AND PEDESTRIAN FACILITIES AND CYCLE TRACKS

9

Parking: Need for parking studies and its ill effects- Parking Standards for different land uses, different types of parking - Conceptual plans for different types of parking;
Pedestrians: Importance, Barriers, Behaviour, Pedestrian facilities – Principles of planning, Level of Service (LoS), Design standards. **Cycle Tracks:** Principles of design, Design criteria, Design standards for Rural Expressways.


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TOTAL: 45

COURSE OUTCOMES

PERIODS

- CO1 Apply the knowledge of science and engineering fundamentals in conducting traffic surveys, analyze the problems and relating it with standards
- CO2 Understand the principles of traffic flow characteristics and their relationships
- CO3 Understand various traffic management measures in addressing the demand Pricing and ITS Applications.
- CO4 Designing various types of control and regulatory measures to meet an efficient traffic network.
- CO5 Understand various type of facilities and plan for Non Motorised Transport

TEXT BOOKS:

1. Kadiyali, L.R. Traffic Engineering and Transport Planning, Khanna Publishers, Delhi, 2019.
2. Khanna, K and Justo C.E.G. and Veeraragavan, A Highway Engineering, Nem Chand Bros., Roorkee, Revised 10th Edition, 2014.
3. Srinivasa Kumar, "Introduction to Traffic Engineering", Universities Press, 2018
4. Parth Chakraborty and Animesh Das Principles of Transportation Engineering, PHI Learning Pvt. Ltd., 2011.
5. Papacosta P.S and Prevedouras, P.D. " Transportation Engineering and Planning, third edition, 2015"

REFERENCES

1. Indian Roads Congress (IRC) specifications: Guidelines and special publications for Traffic Planning and Management.
2. Khanna S. K. and Justo, C.E.G. Highway Engineering, Nem Chand & Bros, Roorkee, 10th Ed., Page 1-7 - 100.
3. C. Johnkieser, Ken Laub, Transportation Engineering: An Introduction, Prentice Hall, 1998.
4. Taylor M.A.P and Young W, Traffic Analysis - New Technology and New Solutions, Hargreave Publishing Company, 1998.
5. Sutter, R.T and Hounsell N.B, Highway Traffic Analysis and design, Macmillan Press Ltd, 1995.
6. Reger P, Roess, William R, Meshack and Likem S, Prassas, Traffic Engineering- Second Edition, Prentice Hall Publishers, Upper Saddle River, New Jersey 1998


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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 Spaceborne 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


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**TOTAL:45
PERIODS**

COURSE OUTCOMES:

- On completion of the course, the student is expected to
- 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.E. Manual of Remote Sensing. Vol.1, American Society of Photogrammetry, Virginia, USA, 2007.
2. Verbyla, David, Satellite Remote Sensing of Natural Resources. CRC Press, 1995
3. Paul Corran 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 Bhattacharya, Remote Sensing and GIS, Oxford University Press, 2011


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COURSE OBJECTIVE:

- Students will be exposed to various problems associated with soil deposits and methods to evaluate them. The different techniques will be taught to them to improve the characteristics of difficult soils as well as design techniques required to implement various ground improvement methods.

UNIT I HYDRAULIC MODIFICATIONS 9

Scope and necessity of ground improvement in Geotechnical engineering basic concepts. Drainage – Ground Water lowering by well points, deep wells, vacuum and electro-osmotic methods. Stabilization by thermal and freezing techniques - Applications.

UNIT II MECHANICAL MODIFICATIONS 9

In situ compaction of granular and cohesive soils, Shallow and Deep compaction methods – Sand piles – Concept, design, factors influencing compaction, Blasting and dynamic consolidation design and relative merits of various methods – Soil liquefaction mitigation methods.

UNIT III PHYSICAL MODIFICATION 9

Preloading with sand drains, fabric drains, wick drains – theories of sand drain - Stone column with and without excessed, lime stone – functions – methods of installation – design, estimation of load carrying capacity and settlement. Root piles and soil nailing – methods of installation – Design and Applications.

UNIT IV MODIFICATION BY INCLUSIONS 9

Reinforcement – Principles and basic mechanism of reinforced earth, simple design. Synthetic and natural fiber based Geotextiles and their applications. Filtration, drainage, separation, erosion control.

UNIT V CHEMICAL MODIFICATION 9

Grouting – Types of grout – Suspension and solution grouts – Basic requirements of grout. Grouting equipment – injection methods – jet grouting – grout monitoring – Electro – Chemical stabilization – Stabilization with cement, lime - Stabilization of expansive clays.

TOTAL: 45 PERIODS**COURSE OUTCOMES:**

On completion of the course, the student is expected to be able to

- CO1 identify and evaluate the deficiencies in the deposits of the given project area and improve its characteristics by hydrrslic modifications
- CO2 improve the ground characteristics by mechanical modifications using various method and design the system
- CO3 improve the ground characteristics by physical modifications using various method and design the system
- CO4 improve the characteristics of soils by various reinforcement techniques and design
- CO5 Analyse the ground and decide the suitable chemical method for improving its characteristics

REFERENCES:

- Pappala, A.J., Huang, J., Han, L. and Hoyos, L.R., Ground Improvement and Geosynthetics; Geotechnical special publication No.207, Geo Institute, ASCE, 2010
- Cook, B.B. and Griffiths S.C., Practical Recommendation for Evaluation and mitigation of Soil Liquefaction, Arkansas, (Project Report), 2010.

4. Rowe, R.K., Geotechnical and Geo-environmental Engineering Handbook, Kluwer Academic Publishers, 2001.
5. Das, B.M., Principles of Foundation Engineering, Fourth Edition, PWS Publishing, 1999.
6. Moseley, M.P., Ground Treatment, Blackie Academic and Professionals, 1998.
7. Koerner, R.M., Designing with Geosynthetics, Third Edition, Prentice Hall 1997.
8. Hahn, R.W., Practical Guide to Grouting of Underground Structures, ASCE, 1996.
9. Jewell, R.A., Soil Reinforcement with Geotextiles, CIRIA, London, 1996.
10. Koerner, R.M. and Welsh, J.P., Construction and Geotechnical Engineering using Synthetic Fabrics, John Wiley, 1990.
11. Han, J., Principles and Practice of Ground Improvement, John Wiley and Sons, New Jersey, Canada 2015.
12. Jones, J.E.P., Earth Reinforcement and Soil Structure, Butterworths, 1985.
13. Manfred R. Haasmann, Engineering Principles of Ground Modifications, McGraw-Hill Publishing Company, New York.



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COURSE OBJECTIVE

- To give an overview of Traffic engineering, various surveys to be conducted, traffic Regulation, management and traffic safety

UNIT I TRAFFIC SURVEYS AND ANALYSES 8

Traffic characteristics: Human, vehicular, and Pavement Characteristics, Problems- presentation of traffic volume data, Annual Average Daily Traffic, Average Daily Traffic, Design hourly traffic volume; Speed- spot speed, presentation of spot speed data, speed and delay studies, methods of conducting spot-speed studies and Speed and Delay studies; Problems Origin and Destination — methods of conducting the survey and presentation of data; parking surveys, presentation of data and analyses, determination of parking demand; Accident studies and analyses; Different problems.

UNIT II TRAFFIC FLOW AND ROADWAY CAPACITY 8

Traffic Flow Characteristics – Basic traffic manoeuvres, Traffic stream flow characteristics, Speed-Flow- Density Relations; Passenger Car Units – Mixed traffic flow and related issues – Concept of PCU value- Factors affecting PCU values- Recommended PCU values for different conditions; Capacity and Level of Service – Factors affecting practical capacity – Design Service Volumes

UNIT III COST - EFFECTIVE TRAFFIC MANAGEMENT TECHNIQUES 10

Traffic System Management: Regulatory Techniques- one way street, Reversible Street, Reversible lane, Turning moment restrictions, closing streets; Traffic Control Devices – Traffic Signs – Road Markings, Traffic Signals, Miscellaneous traffic control devices; Traffic Segregation – Vehicle

segregation, Pedestrian segregation, Traffic signals design, Bus Priority Techniques – Priority manoeuvres – With-flow bus lane and contra-flow bus lane; Self-Enforcing Techniques- Demand Management Techniques (TDM) Road pricing, parking control, Tolls, Staggering of office/educational institution hours.

UNIT IV DESIGN OF ROAD INTERSECTIONS 10

Importance and Classification; Intersections at-grade – uncontrolled, channelised; Rotary intersections (problems)- Signalised intersections (problems)- Grade Separated Intersections – merits and demerits, types, pattern of intersections with different types of interchanges- Capacity, Concept diagrams.

UNIT V DESIGN OF PARKING AND PEDESTRIAN FACILITIES AND CYCLE TRACKS 9

Parking: Need for parking studies and its ill effects- Parking Standards for different land uses, different types of parking - Conceptual plans for different types of parking; **Pedestrians:** Importance, Barriers, Behaviour, Pedestrian facilities – Principles of planning, Level of Service (LoS), Design standards.; **Cycle Tracks:** Principles of design, Design criteria, Design standards for Rural Expressways.

TOTAL: 45 PERIODS**COURSE OUTCOMES**

CO1 Apply the knowledge of science and engineering fundamentals in conducting traffic surveys, analyze the problems and relating it with standards

CO2 Understand the principles of traffic flow characteristics and their relationships

CO3 Identify and recommend traffic management measures in addressing the demand

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- CO4 Designing various types of control and regulatory measures to meet an efficient traffic network.
- CO5 Understand various type of facilities and plan for Non Motorised Transport

TEXT BOOKS:

1. Kadiyali, L.R. Traffic Engineering and Transport Planning, Khans Publishers, Delhi, 2019.
2. Khanna K and Justo C.E.G. and Veeraragavan, A Highway Engineering, Nem Chand Bros., Roorkee, Revised 10th Edition, 2014.
3. Srinivasa Kumar, "Introduction to Traffic Engineering", Universities Press, 2018
4. Partha Chakroborty and Animesh Das Principles of Transportation Engineering, PHI Learning Pvt. Ltd., 2011.
5. Papacosta, P.S and Prevedouros, P.D, " Transportation Engineering and Planning, third edition, 2015

REFERENCES

1. Indian Roads Congress (IRC) Specifications: Guidelines and special publications on Traffic Planning and Management.
2. Khanna S. K, and others, Highway Engineering, Nam Chand & Bros, Roorkee, 2014, Pages 177 – 308.
3. C. Jotin Khisty, Kent Lall, Transportation Engineering: An Introduction, Prentice Hall, 1998
4. Taylor MAP and Young W, Traffic Analysis – New Technology and New Solutions, Hargreen Publishing Company , 1998.
5. Salter, R.I and Hounsell N.B, Highway Traffic Analysis and design, Macmillan Press Ltd. 1996.
6. Roger P. Roess, William R. Mcshane and Elena S. Prassas, Traffic Engineering- Second Edition, Prentice Hall Publishers., Upper Saddle River, New Jersey 1998


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REMOTE SENSING

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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 Spaceborne 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


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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.E. Manual of Remote Sensing. Vol. I, American Society of Photogrammetry, 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


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OBJECTIVE:

- To make the students familiar with various structural health monitoring tools and techniques.

UNIT I INTRODUCTION TO STRUCTURAL HEALTH MONITORING 9

Need for SHM, Structural Health Monitoring versus Non-Destructive Evaluation, Methods of SHM-Local & Global Techniques for SHM, Short & Long-Term Monitoring, Active & Passive Monitoring, Remote Structural Health Monitoring- Advantages of SHM - Challenges in SHM

UNIT II SENSORS AND INSTRUMENTATION FOR SHM 9

Sensors for measurements: Electrical Resistance Strain Gages, Vibrating Wire Strain Gages, Fiber Optic Sensors, Temperature Sensors, Accelerometers, Displacement Transducers, Load Cells, Humidity Sensors, Crack Propagation Measuring Sensors, Corrosion Monitoring Sensors, Pressure Sensors, Data Acquisition – Data Transmission - Data Processing – Storage of processed data – Knowledgeable information processing

UNIT III STATIC AND DYNAMIC MEASUREMENT TECHNIQUES FOR SHM 9

Static measurement - Load test, Concrete core trepanning, Flat jack techniques, Static response measurement, Dynamic measurement -Vibration based testing- Ambient Excitation methods, Measured forced Vibration-Impact excitation, step relaxation test, shaker excitation method.

UNIT IV DAMAGE DETECTION 9

Damage Diagnostic methods based on vibrational response- Method based on modal frequency/shape/damping, Curvature and flexibility method, Modal strain energy method, Sensitivity method, Baseline-free method, Cross-correlation method. Damage Diagnostic methods based on wave propagation Methods-Bulk waves/Lamb waves: Reflection and transmission, Wave tuning/mode selectivity, Migration imaging, Phased array imaging, Focusing array/SAFT imaging.

UNIT V DATA PROCESSING AND CASE STUDIES 9

Advanced signal processing methods -Wavelet, Hilbert-Huang transform, Neural networks, Support Vector Machine Principal component analysis, Outlier analysis. Applications of SHM on bridges and buildings, case studies of SHM in Civil/ Structural engineering.

TOTAL: 45 PERIODS**OUTCOMES:**

On completion of this course, the student is expected to be able to:

CO1	Understand the need, advantages and challenges of SHM
CO2	Know the different types of sensors and instrumentation techniques
CO3	Gain knowledge of the static and dynamic measurement techniques
CO4	Compare the various damage detection techniques
CO5	Know the various data processing methods through case studies

REFERENCES

- Daniel Balageas, Peter Fritzen, Alfredo Guemes, Structural Health Monitoring, John Wiley & Sons, 2006.
- Douglas E Adams, Health Monitoring of Structural Materials and Components Methods with Applications, Wiley Publishers, 2007
- Hua-Peng Chen, Structural Health Monitoring of Large Civil Engineering Structures, Wiley Publishers, 2018
- Ansari, F Karbhari, Structural health monitoring of civil infrastructure systems, V.M, Woodhead Publishing, 2009
- J. P. Ou, H. Li and Z. D, "Ocean Structural Health Monitoring and Intelligent Infrastructure", Vol.1, Taylor and Francis Group, London, UK, 2006
- Victor Giurgiutiu, "Structural Health Monitoring with Wafer Active Sensors", Academic Press Inc,

OBJECTIVE:

- To design, detail and retrofit a masonry structure

UNIT I INTRODUCTION

9

Introduction – Masonry construction – National and International perspective – Historical development, Modern masonry, Material Properties – Masonry units: clay and concrete blocks, Mortar, grout and reinforcement, Bonding patterns, Shrinkage and differential movements.

UNIT II DESIGN OF COMPRESSION MEMBER

9

Principles of masonry design, Masonry standards: IS 1905 and others – Masonry in Compression – Prism strength, Eccentric loading – Kern distance, Structural Wall, Columns and Plasters, Retaining Wall, Pier and Foundation – Prestressed masonry.

UNIT III DESIGN OF MASONRY UNDER LATERAL LOADS

9

Masonry under Lateral loads – In-plane and out-of-plane loads, Ductility of Reinforced Masonry Members Analysis of perforated shear walls, Lateral force distribution – flexible and rigid diaphragms, Behaviour of Masonry – Shear and flexure – Combined bending and axial loads – Reinforced and unreinforced masonry – Infill masonry.

UNIT IV EARTHQUAKE RESISTANT DESIGN OF MASONRY STRUCTURES

9

Structural design of Masonry – Consideration of seismic loads, concepts of confined masonry – Cyclic loading and ductility of shear walls for seismic design – Code provisions – Working and Ultimate strength design – In-plane and out-of-plane design criteria for load-bearing and infills, connecting elements and ties, Modeling Techniques, Static Push Over Analysis and use of Capacity Design Spectra – use of Software.

UNIT V RETROFITTING OF MASONRY

9

Seismic evaluation and Retrofit of Masonry – In-situ and non-destructive tests for masonry – properties – Repair and strengthening of techniques.

TOTAL: 45 PERIODS**OUTCOMES:**

- On completion of the course, the student is expected to be able to

CO1	Explain the properties of a masonry unit and the various components
CO2	Design a masonry structure for compression
CO3	Design a masonry structure for lateral loads
CO4	Design an earthquake-resistant masonry wall
CO5	Suggest retrofitting techniques for existing masonry walls

REFERENCES:

- Drysdale, R. G, Hamid, A. H. and Baker, L. R, "Masonry Structures: Behaviour & Design", Prentice Hall Hendry, 1994.
- A.W. Hendry, B.P. Sinha and Davis, S. R, "Design of Masonry Structures", E & FN Spon, UK, 2017.
- R.S. Schneider and W.L. Dickey, "Reinforced Masonry Design", Prentice Hall, 3rd edition, 1994.
- Paulay, T. and Priestley, M. J. N., "Seismic Design of Reinforced Concrete and Masonry Buildings", John Wiley, 1992.
- A.W. Hendry, "Structural Masonry", 2nd Edition, Palgrave MacMillan Press, 1998.

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OBJECTIVE:

- To develop knowledge to solve structural analysis problems using reliability concepts.

UNIT I DATA ANALYSIS 9

Graphical representation Histogram, frequency polygon, Measures of central tendency- grouped and ungrouped data, measures of dispersion, measures of asymmetry, Curve fitting and Correlation: Fitting a straight line, curve of the form $y = ab^x$, and parabola, Coefficient of correlation

UNIT II PROBABILITY CONCEPTS 9

Random events-Sample space and events, Venn diagram and event space, Measures of probability- interpretation, probability axioms, addition rule, multiplication rule, conditional probability, probability tree diagram, statistical independence, total probability theorem and Baye's theorem

UNIT III RANDOM VARIABLES 9

Probability mass function, probability density function, Mathematical expectation, Chebyshev's theorem, Probability distributions: Discrete distributions- Binomial and poisson distributions, Continuous distributions, Normal, Log normal distributions

UNIT IV RELIABILITY ANALYSIS 9

Measures of reliability-factor of safety, safety margin, reliability index, performance function and limiting state, Reliability Methods-First Order Second Moment Method (FOSM), Point Estimate Method (PEM), and Advanced First Order Second Moment Method (Hasofer-Lind's method).

UNIT V SYSTEM RELIABILITY 9

Influence of correlation coefficient, redundant and non-redundant systems series, parallel and combined systems, Uncertainty in reliability assessments: Confidence limits, Bayesian revision of reliability, Simulation Techniques, Monte Carlo simulation- Statistical experiments, sample size and accuracy, Generation of random numbers, random numbers with standard uniform distribution, continuous random variables, discrete random variables

TOTAL: 45 PERIODS

OUTCOMES:

On completion of this course, the student is expected to be able to

CO1	Achieve the Knowledge of design and development of problem-solving skills.
CO2	Understand the principles of reliability.
CO3	Design and develop analytical skills.
CO4	Summarize the Probability distributions
CO5	Understands the concept of System reliability.

REFERENCES:

- A Papoulis, Probability, Random Variables and Stochastic Processes, McGraw-Hill, New York, 2017.
- R E Melchers, Structural Reliability Analysis and Prediction, Third Edition, John Wiley & Sons Ltd, Chichester, England, 2018.
- O. Ditlevsen, H. O. Madsen, Structural Reliability Methods, Wiley, 1st Edition, 1996.
- Srinivasan Chandrasekaran, Offshore Structural Engineering: Reliability and Risk Assessment, CRC Press, Florida, 2016.
- Jack R Benjamin, C. Allin Cornell, Probability, Statistics, and Decision for Civil Engineers, Dover Publications, New York, 2014.

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OBJECTIVE:

- To disseminate knowledge about planning and design of RCC and Steel Industrial structures.

UNIT I PLANNING AND FUNCTIONAL REQUIREMENTS

Classification of Industries and Industrial structures - planning for Layout Requirements regarding Lighting, Ventilation and Fire Safety - Protection against noise and vibration - Guidelines of Factories Act. 9

UNIT II INDUSTRIAL BUILDINGS

Steel and RCC - Gantry Girder, Crane Girders - Design of Corbels and Nibs - Design of Staircase. 9

UNIT III POWER PLANT STRUCTURES

Types of power plants - Containment structures - Cooling Towers - Bunkers and Silos - Pipe Rack and supporting structures 9

UNIT IV TRANSMISSION LINE STRUCTURES AND CHIMNEYS

Analysis and design of steel monopoles, transmission line towers - Sag and Tension calculations, Methods of tower testing - Design of self-supporting and guyed chimney, Design of Chimney bases. 9

UNIT V FOUNDATION

Foundation for Towers, Chimneys and Cooling Towers - Design of Block foundations for machines - Design of Turbo Generator Foundation. 9

TOTAL: 45 PERIODS**OUTCOMES:**

- On completion of the course, the student is expected to be able to

CO1	Develop the concept of planning & functional requirements of industrial standards.
CO2	Analyse and design Steel Gantry girders & Crane girders and RCC design of corbels, nibs and staircase.
CO3	Analyse & design cooling towers, bunkers, silos and pipe supporting structures.
CO4	Analyse and design Steel transmission line towers and chimneys
CO5	Design foundations for cooling tower, chimneys and turbo generator.

REFERENCES:

- Jurgen Axel Adam, Katharina Hausmann, Frank Juttner, Klaus-Daniel, Industrial Buildings: A Design Manual, Birkhauser Publishers, 2004.
- Santhakumar A.R. and Murthy S.S., Transmission Line Structures, Tata McGraw Hill 1992.
- Swami saran, Analysis & Design of substructures, Limit state Design second Edition 2018.
- N.Subramanian, Design of Steel Structures, United Press, 2018.
- N. Krishna Raju, Advanced Reinforced concrete Design, 3rd edition 2016


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**MECHANICS OF FIBER REINFORCED POLYMER
COMPOSITE MATERIALS
L T P C**

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OBJECTIVE:-

- To study the behaviour of composite materials and to investigate the failure and fracture characteristics.

UNIT I INTRODUCTION

Introduction to Composites, Classifying composite materials, commonly used fiber and matrix constituents, Composite Construction, Properties of Unidirectional Long Fiber Composites and Short Fiber Composites. 9

UNIT II STRESS STRAIN RELATIONS

Concepts in solid mechanics, Hooke's law for orthotropic and anisotropic materials, Linear Elasticity for Anisotropic Materials, Rotations of Stresses, Strains, Residual Stresses 9

UNIT III ANALYSIS OF LAMINATED COMPOSITES

Governing equations for anisotropic and orthotropic plates. Angle-ply and cross ply laminates – Static, Dynamic and Stability analysis for Simpler cases of composite plates, Inter laminar stresses. 9

UNIT IV FAILURE AND FRACTURE OF COMPOSITES

Netting Analysis, Failure Criterion, Maximum Stress, Maximum Strain, Fracture Mechanics of Composites, Sandwich Construction. 9

UNIT V APPLICATIONS AND DESIGN

Meal and Ceramic Matrix Composites, Applications of Composites, Composite Joints, Design with Composites, Review, Environmental Issues 9

TOTAL: 45 PERIODS

OUTCOMES:

On completion of this course, the student is expected to be able to

CO1	Explain the various types of composites and their constituents
CO2	Derive the constitutive relationship and determine the stresses and strains in a composite material
CO3	Analyze a laminated plate
CO4	Explain the various failure criteria and fracture mechanics of composites
CO5	Design simple composite elements

REFERENCES

- Agarwal, B.D. Broutman, L.J. and Chandrashekhara, K. "Analysis and Performance of Fiber Composites", Fourth Edition, John-Wiley and Sons, 2017
- Daniel, L.M. and Ishai, O. "Engineering Mechanics of Composite Materials", Second Edition, Oxford University Press, 2005.
- Hyer M.W., and White S.R., "Stress Analysis of Fiber-Reinforced Composite Materials", D. Estech Publications Inc., 2009
- Jones R.M., "Mechanics of Composite Materials", Taylor and Francis Group 1999.
- Mukhopadhyay M. "Mechanics of Composite Materials and Structures", Universities Press, India, 2005.

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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	Analyse ground foundation and structure interaction problems

REFERENCES:

- John P. Wolf, (1985) Soil-structure interaction, Prentice Hall, 1987.
- Bowels, J.E., "Analytical and Computer methods in Foundation" McGraw-Hill Book Co., New York, 1974
- Desai C.S. and Christian J.T., "Numerical Methods in Geotechnical Engineering" McGraw Hill Book Co. New York, 1977.
- Soil Structure Interaction, the real behaviour of structures, Institution of Structural Engineers, 1989.
- A.P.S. Selvadurai, Elastic Analysis of Soil Foundation Interaction, Developments in Geotechnical Engg vol-17, Elsevier Scientific Publishing Co., 1979.
- Prakash, S., and Sharma, H. D., "Pile Foundations in Engineering

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DESIGN OF FORMWORK

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OBJECTIVE:

- To study and understand the detailed planning of formwork, Design of forms for various elements such as foundation, slabs, beams, columns and walls.

UNIT I INTRODUCTION

9

General objectives of formwork building - Development of a Basic System - Key Areas of cost reduction - Requirements and Selection of Formwork.

UNIT II FORMWORK MATERIALS AND TYPES

9

Timber, Plywood, Steel, Aluminium, Plastic, and Accessories. Horizontal and Vertical Formwork Supports, Flying Formwork, Table Form, Tunnel Form, Slip Form, Formwork for Precast Concrete,

UNIT III FORMWORK DESIGN

9

Concepts, Formwork Systems and Design for Foundations, Walls, Columns, Slab and Beams.

UNIT IV FORMWORK DESIGN FOR SPECIAL STRUCTURES

9

Shells, Domes, Folded Plates, Overhead Water Tanks, Natural Draft Cooling Tower, Bridges.

UNIT V FORMWORK FAILURES

9

Formwork Management Issues - Pre- and Post-Award, Formwork Failures: Causes and Case studies in Formwork Failure, Formwork Issues in Multi story Building Construction.

TOTAL: 45 PERIODS

OUTCOMES:

- On completion of the course, the student is expected to be able to

CO1	Select proper formwork, accessories and material
CO2	Design the form work for Beams, Slabs, columns, Walls and Foundations
CO3	Design the form work for Special Structures
CO4	Describe the working of flying formwork.
CO5	Judge the formwork failures through case studies.

REFERENCES:

- Formwork for Concrete Structures, R.L. Paurifoy, McGraw Hill India, 2010.
- Formwork for Concrete Structures, Kumar Neeraj, Tata McGraw Hill Education, 2012.
- IS 14687: 1999, False work for Concrete Structures - Guidelines, BIS.
- Hurd, M.K., Formwork for Concrete, Special Publication No.4, American Concrete Institute, Detroit, 1996
- Michael P. Hurst, Construction Press, London and New York, 2003.

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OBJECTIVE:

- To develop an understanding of the philosophy of design of prestressed concrete
- To be able to design indeterminate prestressed concrete structure
- To design the prestressed concrete bridge and composite sections.

UNIT I INTRODUCTION

Concepts of Prestressing – Materials and methods of prestressing – Design philosophy- Analysis methods, Time-dependent deformation of concrete and losses of prestress. 9

UNIT II DESIGN FOR FLEXURE, SHEAR AND TORSION

Behaviour of flexural members, determination of ultimate flexural strength using various Codal provisions - Design for Flexure, Shear, torsion and bond of pre-stressed concrete elements – Transfer of prestress – Box girders - Camber, deflection and crack control. 9

UNIT III DESIGN OF CONTINUOUS AND COMPOSITE BEAMS

Statically indeterminate structures - Analysis and design of continuous beams and frames– Choice of cable profile - Methods of achieving continuity – concept of linear transformations, concordant cable profile and gap cables – Composite sections of prestressed concrete beam and cast in situ RC slab - Design of composite sections - Partial prestressing - Limit State design of partially prestressed concrete beams. 9

UNIT IV DESIGN OF TENSION AND COMPRESSION MEMBERS

Pre-stressed concrete compression and tension members – application in the design of prestressed pipes and prestressed concrete cylindrical water tanks – Design of compression members with and without flexure – its application in the design of piles, flag masts and similar structures – Two way pre-stressed concrete floor systems – Connections for pre-stressed concrete elements. 9

UNIT V DESIGN OF PRESTRESSED CONCRETE BRIDGES

Review of IRC and IRS loadings. Effect of concentrated loads on deck slabs, load distribution methods for concrete bridges. Analysis and Design of superstructures - Design of pre-stressed concrete bridges incorporating long-term effects like creep, shrinkage, relaxation, and temperature effects, Dynamic response of bridge decks. 9

TOTAL: 45 PERIODS**OUTCOMES:**

- On completion of the course, the student is expected to be able to

CO1	Identify the various methods of prestressing and estimate the loss
CO2	Design the beams for flexure, shear, bond and torsion
CO3	Design the continuous beams and composite beams
CO4	Design the water tank, piles and masts
CO5	Analyze and design the prestressed concrete bridge

REFERENCES:

1. Arthur H. Nilson, "Design of Prestressed Concrete", John Wiley and Sons Inc, New York, 2004.
2. Krishna Raju, "Prestressed Concrete", Tata McGraw Hill Publishing Co., New Delhi, 6th Edition, 2018.
3. Lin.T.Y.andBurns.H "Design of Prestressed Concrete Structures", John Wiley and Sons Inc, 3rd Edition, 2010.
4. Rajagopalan.N, "Prestressed Concrete", Narosa Publications, New Delhi, 2014.
5. Sinha.N.C.and.Roy.S.K, "Fundamentals of Prestressed Concrete", S.Chand and Co., 1998
6. Robinson.Victor. D., Essentials of Bridge Engineering, Oxford and IBH Publishing Co., New Delhi, 2004.

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DESIGN OF STEEL-CONCRETE COMPOSITE STRUCTURES

L T P C
3 0 0 3

OBJECTIVE:

- To develop an understanding of the behaviour and design concrete composite elements and structures.

UNIT I INTRODUCTION

Introduction to steel – concrete composite construction – Codes – Composite action – Serviceability and Construction issues in design. 9

UNIT II DESIGN OF COMPOSITE MEMBERS

Design of composite beams, slabs, columns, beam – columns – Design of composite trusses. 9

UNIT III DESIGN OF CONNECTIONS

Shear connectors – Types – Design of connections in composite structures – Design of shear connectors – Partial shear interaction. 9

UNIT IV COMPOSITE BOX GIRDER BRIDGES

Introduction – Design concepts of box girder bridges and corrugated web girder bridges. 9

UNIT V CASE STUDIES

Case studies on steel – concrete composite construction in buildings – seismic behaviour of composite structures. 9

OUTCOMES:

TOTAL: 45 PERIODS

- On completion of the course, the student is expected to be able to

CO1	Explain composite action
CO2	Design composite elements
CO3	Design connections
CO4	Explain the concept of design of composite box girder bridges
CO5	Study and evaluate case studies

REFERENCES:

- Johnson R.P., "Composite Structures of Steel and Concrete Beams, Slabs, Columns and Frames for Buildings", Vol. 1, Fourth Edition, Blackwell Scientific Publications, 2018
- Oehlers D.J. and Bradford M.A., "Composite Steel and Concrete Structural Members. Fundamental behaviour", Revised Edition, Pergamon press, Oxford, 2013.
- Owens: G.W and Knowles: P, "Steel Designers Manual", Seventh Edition, Steel Concrete Institute(UK), Oxford Blackwell Scientific Publications, 2011.
- Narayanan R, "Composite steel structures – Advances, design and construction", Elsevier, Applied science, UK, 1987



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DESIGN OF SHELL AND SPATIAL STRUCTURES

L T P C
3 0 0 3

OBJECTIVE:

- To study the behaviour and design of shells, folded plates, space frames and application of FORMIAN software.

UNIT I	CLASSIFICATION OF SHELLS	9
Classification of shells, types of shells, structural action, - Design of circular domes, conical roofs, circular cylindrical shells by ASCE Manual No.31.		
UNIT II	FOLDED PLATES	9
Folded Plate structures, structural behaviour, types, design by ACI - ASCE Task Committee method - pyramidal roof- Prismatical roof.		
UNIT III	INTRODUCTION TO SPACE FRAME	9
Space frames - configuration - types of nodes - Design Philosophy - Behaviour.		
UNIT IV	ANALYSIS AND DESIGN	9
Analysis of space frames – Design of Nodes – Pipes - Space frames – Introduction to Computer-Aided Design.		
UNIT V	SPECIAL METHODS	9
Application of Formex Algebra, FORMIAN for generation of configuration.		

TOTAL: 45 PERIODS


OUTCOMES:

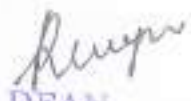
On completion of this course, the student is expected to be able to

CO1	Explain the different forms of shells and design the domes and shells
CO2	Evaluate the structural behaviour and design of folded plate structures
CO3	Explain the various functional configurations of space frames
CO4	Design of space frames and apply the knowledge of CAD for the analysis of space structures
CO5	Analyse the configurations of space structures using FORMIAN software

REFERENCES

1. Billington, D.P. "Thin Shell Concrete Structures", McGraw Hill Book Co., New York, ASCE Manual No.31, Design of Cylindrical Shells, 1982
2. Varghese, P.C., "Design of Reinforced Concrete Shells and Folded Plates", PHI Learning Pvt. Ltd., 2010.
3. Subramanian, N., "Space Structures: Principles and Practice", Multi-Science Publishing Co. Ltd, 2008.
4. Ramasamy, G.S., "Analysis, Design and Construction of Steel Space Frames", Thomas Telford Publishing, 2002.
5. Wilby, C. "Concrete Folded Plate Roofs", Elsevier, 1998.


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OBJECTIVE:

- To develop knowledge to solve Advanced Prestressed Concrete problems using reliability concepts.

UNIT I DATA ANALYSIS

9

Graphical representation Histogram, frequency polygon, Measures of central tendency- grouped and ungrouped data, measures of dispersion, measures of asymmetry. Curve fitting and Correlation: Fitting a straight line, curve of the form $y = ab^x$, and parabola. Coefficient of correlation

UNIT II PROBABILITY CONCEPTS

9

Random events-Sample space and events, Venn diagram and event space, Measures of probability-interpretation, probability axioms, addition rule, multiplication rule, conditional probability, probability tree diagram, statistical independence, total probability theorem and Baye's theorem

UNIT III RANDOM VARIABLES

9

Probability mass function, probability density function, Mathematical expectation, Chebyshev's theorem, Probability distributions: Discrete distributions- Binomial and poison distributions, Continuous distributions, Normal, Log normal distributions

UNIT IV RELIABILITY ANALYSIS

9

Measures of reliability-factor of safety, safety margin, reliability index, performance function and limiting state. Reliability Methods-First Order Second Moment Method (FOSM), Point Estimate Method (PEM), and Advanced First Order Second Moment Method (Hasofer-Lind's method)

UNIT V SYSTEM RELIABILITY

9

Influence of correlation coefficient, redundant and non-redundant systems series, parallel and combined systems, Uncertainty in reliability assessments- Confidence limits, Bayesian revision of reliability, Simulation Techniques- Monte Carlo simulation- Statistical experiments, sample size and accuracy, Generation of random numbers, random numbers with standard uniform distribution, continuous random variables, discrete random variables

TOTAL: 45 PERIODS**OUTCOMES:**

On completion of this course, the student is expected to be able to

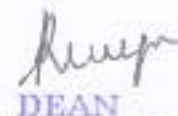
CO1	Achieve the Knowledge of design and development of problem-solving skills.
CO2	Understand the principles of reliability.
CO3	Design and develop analytical skills.
CO4	Summarize the Probability distributions
CO5	Understands the concept of System reliability.

REFERENCES:

- A Papoulis, Probability, Random Variables and Stochastic Processes, McGraw-Hill, New York, 2017.
- RE Melchers, Structural Reliability Analysis and Prediction, Third Edition, John Wiley & Sons Ltd, Chichester, England, 2018.
- O. Ditlevsen, H. O. Madsen, Structural Reliability Methods, Wiley, 1st Edition, 1996.
- Srinivasan Chandrasekaran, Offshore Structural Engineering: Reliability and Risk Assessment, CRC Press, Florida, 2016.



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OBJECTIVE:

- To disseminate knowledge about planning and design of RCC and Steel Industrial structures.

UNIT I	PLANNING AND FUNCTIONAL REQUIREMENTS	9
Classification of Industries and Industrial structures - planning for Layout Requirements regarding Lighting, Ventilation and Fire Safety - Protection against noise and vibration - Guidelines of Factories Act.		
UNIT II	INDUSTRIAL BUILDINGS	9
Steel and RCC - Gantry Girder, Crane Girders - Design of Corbels and Nibs - Design of Staircase.		
UNIT III	POWER PLANT STRUCTURES	9
Types of power plants - Containment structures - Cooling Towers - Bunkers and Silos - Pipe Rack and supporting structures		
UNIT IV	TRANSMISSION LINE STRUCTURES AND CHIMNEYS	9
Analysis and design of steel monopoles, transmission line towers - Sag and Tension calculations, Methods of tower testing - Design of self-supporting and guyed chimney, Design of Chimney bases.		
UNIT V	FOUNDATION	9
Foundation for Towers, Chimneys and Cooling Towers - Design of Block foundations for machines - Design of Turbo Generator Foundation.		


TOTAL: 45 PERIODS**OUTCOMES:**

- On completion of the course, the student is expected to be able to

CO1	Develop the concept of planning & functional requirements of industrial standards.
CO2	Analyse and design steel Gantry girders & Crane girders and RCC design of corbels, nibs and staircase.
CO3	Analyse & design cooling towers, bunkers, silos and pipe supporting structures.
CO4	Analyse and design Steel transmission line towers and chimneys.
CO5	Design foundations for cooling tower, chimneys and turbo generator.

REFERENCES:

- Jurgen Axel Adam, Katharina Hausmann, Frank Jutiner, Klaus Daniel, Industrial Buildings: A Design Manual, Birkhauser Publishers, 2004.
- Santhakumar A.R. and Murthy S.S., Transmission Line Structures, Tata McGraw Hill, 1992.
- Swami saran, Analysis & Design of substructures, Limit state Design second Edition 2018.
- N.Subramanyam, Design of Steel Structures, United Press, 2018
- N. Krishna Raju, Advanced Reinforced concrete Design, 3rd edition 2016,


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OBJECTIVE:

- To make the students familiar with various structural health monitoring tools and techniques.

UNIT I INTRODUCTION TO STRUCTURAL HEALTH MONITORING 9

Need for SHM, Structural Health Monitoring versus Non-Destructive Evaluation, Methods of SHM- Local & Global Techniques for SHM, Short & Long-Term Monitoring, Active & Passive Monitoring, Remote Structural Health Monitoring- Advantages of SHM - Challenges in SHM

UNIT II SENSORS AND INSTRUMENTATION FOR SHM 9
Sensors for measurements: Electrical Resistance Strain Gages, Vibrating Wire Strain Gauges, Fiber Optic Sensors, Temperature Sensors, Accelerometers, Displacement Transducers, Load Cells, Humidity Sensors, Crack Propagation Measuring Sensors, Corrosion Monitoring Sensors, Pressure Sensors, Data Acquisition – Data Transmission - Data Processing – Storage of processed data - Knowledgeable information processing.

UNIT III STATIC AND DYNAMIC MEASUREMENT TECHNIQUES FOR SHM 9
Static measurement - Load test, Concrete core trepanning, Flat jack techniques, Static response measurement, Dynamic measurement -Vibration based testing- Ambient Excitation methods, Measured forced Vibration-Impact excitation, step relaxation test, shaker excitation method.

UNIT IV DAMAGE DETECTION 9
Damage Diagnostic methods based on vibrational response- Method based on modal frequency/shape/damping, Curvature and flexibility method, Modal strain energy method, Sensitivity method, Baseline-free method, Cross-correlation method, Damage Diagnostic methods based on wave propagation Methods-Bulk waves/Lamb waves, Reflection and transmission, Wave tuning/mode selectivity, Migration imaging, Phased array imaging, Focusing array/SAPT imaging.

UNIT V DATA PROCESSING AND CASE STUDIES 9
Advanced signal processing methods -Wavelet, Hilbert-Huang transform, Neural networks, Support Vector Machine Principal component analysis, Outlier analysis. Applications of SHM on bridges and buildings, case studies of SHM in CIVIL Structural engineering.

TOTAL: 45 PERIODS**OUTCOMES:**

On completion of this course, the student is expected to be able to

CO1	Understand the need, advantages and challenges of SHM
CO2	Know the different types of sensors and instrumentation techniques
CO3	Gain knowledge of the static and dynamic measurement techniques
CO4	Compare the various damage detection techniques
CO5	Know the various data processing methods through case studies

REFERENCES

- Daniel Balageas, Peter Fritzen, Alfredo Guemes, Structural Health Monitoring, John Wiley & Sons, 2006.
- Douglas E Adams, Health Monitoring of Structural Materials and Components Methods with Applications, Wiley Publishers, 2007
- Hua-Peng Chen, Structural Health Monitoring of Large Civil Engineering Structures, Wiley Publishers, 2018
- Ansari, F Karbhari, Structural health monitoring of civil infrastructure systems, V.M, Woodhead Publishing, 2009
- J. P. Ou, H. Li and Z. D. "Duan Structural Health Monitoring and Intelligent Infrastructure", Vol1, Taylor and Francis Group, London, UK, 2006.
- Vicente Burgin, "Structural Health Monitoring with Water Active Sensors", Academic Press Inc, 2014

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OBJECTIVE:

- To design, detail and retrofit a masonry structure

UNIT I INTRODUCTION 9

Introduction – Masonry construction – National and International perspective – Historical development, Modern masonry, Material Properties – Masonry units: clay and concrete blocks, Mortar, grout and reinforcement, Bonding patterns, Shrinkage and differential movements.

UNIT II DESIGN OF COMPRESSION MEMBER 9

Principles of masonry design, Masonry standards: IS 1905 and others – Masonry in Compression – Prism strength, Eccentric loading – Kern distance, Structural Wall, Columns and Plasters, Retaining Wall, Pier and Foundation – Prestressed masonry

UNIT III DESIGN OF MASONRY UNDER LATERAL LOADS 9

Masonry under Lateral loads – In-plane and out-of-plane loads, Ductility of Reinforced Masonry Members Analysis of perforated shear walls, Lateral force distribution – flexible and rigid diaphragms, Behaviour of Masonry – Shear and flexure – Combined bending and axial loads – Reinforced and unreinforced masonry – Infill masonry

UNIT IV EARTHQUAKE RESISTANT DESIGN OF MASONRY STRUCTURES 9

Structural design of Masonry – Consideration of seismic loads – concepts of confined masonry – Cyclic loading and ductility of shear walls for seismic design – Code provisions – Working and Ultimate strength design – In-plane and out-of-plane design criteria for load-bearing and infills, connecting elements and ties, Modeling Techniques, Static Push Over Analysis and use of Capacity Design Spectra – use of Software.

UNIT V RETROFITTING OF MASONRY 9

Seismic evaluation and Retrofit of Masonry – In-situ and non-destructive tests for masonry properties – Repair and strengthening of techniques.

TOTAL: 45 PERIODS

OUTCOMES:

- On completion of the course, the student is expected to be able to

CO1	Explain the properties of a masonry unit and the various components
CO2	Design a masonry structure for compression
CO3	Design a masonry structure for lateral loads
CO4	Design an earthquake-resistant masonry wall
CO5	Suggest retrofitting techniques for existing masonry walls

REFERENCES:

- Drysdale, R. G. Hamel, A. H. and Baker, L. R., "Masonry Structures: Behaviour & Design", Prentice Hall Hendry, 1994.
- A.W. Hendry, B.P. Sinha and Davis, S. R., "Design of Masonry Structures", E & FN Spon, UK, 2017.
- R.S. Schneider and W.L. Dickey, "Reinforced Masonry Design", Prentice Hall, 3rd edition, 1994.
- Paulay, T. and Priestley, M. J. N., "Seismic Design of Reinforced Concrete and Masonry Buildings", John Wiley, 1992.
- A.W. Hendry, "Structural Masonry", 2nd Edition, Palgrave MacMillan Press, 1998.

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19255E43DP **MECHANICS OF FIBER REINFORCED POLYMER
COMPOSITE MATERIALS
L T P C**

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OBJECTIVE:

- To study the behaviour of composite materials and to investigate the failure and fracture characteristics.

UNIT I INTRODUCTION 9

Introduction to Composites, Classifying composite materials, commonly used fiber and matrix constituents, Composite Construction, Properties of Unidirectional Long Fiber Composites and Short Fiber Composites.

UNIT II STRESS STRAIN RELATIONS 9

Concepts in solid mechanics, Hooke's law for orthotropic and anisotropic materials, Linear Elasticity for Anisotropic Materials, Rotations of Stresses, Strains, Residual Stresses

UNIT III ANALYSIS OF LAMINATED COMPOSITES 9

Governing equations for anisotropic and orthotropic plates, Angle-ply and cross ply laminates – Static, Dynamic and Stability analysis for Simpler cases of composite plates, Inter laminar stresses.

UNIT IV FAILURE AND FRACTURE OF COMPOSITES 9

Netting Analysis, Failure Criterion, Maximum Stress, Maximum Strain, Fracture Mechanics of Composites, Sandwich Construction.

UNIT V APPLICATIONS AND DESIGN 9

Met and Ceramic Matrix Composites, Applications of Composites, Composite Joints, Design with Composites, Review, Environmental Issues

TOTAL: 45 PERIODS

OUTCOMES:

On completion of this course, the student is expected to be able to:

CO1	Explain the various types of composites and their constituents
CO2	Derive the constitutive relationship and determine the stresses and strains in a composite material
CO3	Analyze a laminated plate
CO4	Explain the various failure criteria and fracture mechanics of composites
CO5	Design simple composite elements

REFERENCES

- Agarwal, B.D. Broutman, L.J. and Chandrashekhara, K. "Analysis and Performance of Fiber Composites", Fourth Edition, John-Wiley and Sons, 2017
- Daniel, I.M. and Ishai, O. "Engineering Mechanics of Composite Materials", Second Edition, Oxford University Press, 2005.
- Hyer M.W., and White S.R., "Stress Analysis of Fiber-Reinforced Composite Materials", D.E. Stech Publications Inc., 2009
- Jones R.M., "Mechanics of Composite Materials", Taylor and Francis Group 1999.
- Mukhopadhyay, M. "Mechanics of Composite Materials and Structures", Universities Press, India, 2005.



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19255E43EP PERFORMANCE OF STRUCTURES WITH SOIL STRUCTURE INTERACTION

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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 settlements 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:

- John P. Wolf, (1985) Soil-structure interaction, Prentice Hall, 1987.
- Bowels, J.E., "Analytical and Computer methods in Foundation" McGraw Hill Book Co., New York, 1974
- Desai C.S. and Christian J.T., "Numerical Methods in Geotechnical Engineering" McGraw Hill Book Co. New York, 1977.
- Soil Structure Interaction, the real behaviour of structures, Institution of Structural Engineers, 1989.
- A.P.S. Selvadurai, Elastic Analysis of Soil Foundation Interaction, Developments in Geotechnical Engg vol-17, Elsevier Scientific Publishing Co., 1979.
- Prakash, S., and Sharma, H. D., "Pile Foundations in Engineering

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OBJECTIVE:

- To study and understand the detailed planning of formwork. Design of forms for various elements such as foundation, slabs, beams, columns and walls.

UNIT I INTRODUCTION

General objectives of formwork building - Development of a Basic System - Key Areas of cost reduction - Requirements and Selection of Formwork. 9

UNIT II FORMWORK MATERIALS AND TYPES

Timber, Plywood, Steel, Aluminium, Plastic, and Accessories. Horizontal and Vertical Formwork Supports. Flying Formwork, Table Form, Tunnel Form, Slip Form, Formwork for Precast Concrete. 9

UNIT III FORMWORK DESIGN

Concepts, Formwork Systems and Design for Foundations, Walls, Columns, Slab and Beams. 9

UNIT IV FORMWORK DESIGN FOR SPECIAL STRUCTURES

Shells, Domes, Folded Plates, Overhead Water Tanks, Natural Draft Cooling Tower, Bridges. 9

UNIT V FORMWORK FAILURES

Formwork Management Issues - Pre- and Post-Award. Formwork Failures: Causes and Case studies in Formwork Failure, Formwork Issues in Multi story Building Construction. 9

OUTCOMES:

TOTAL: 45 PERIODS

- On completion of the course, the student is expected to be able to

CO1	Select proper formwork, accessories and material
CO2	Design the form work for Beams, Slabs, columns, Walls and Foundations
CO3	Design the form work for Special Structures
CO4	Describe the working of flying formwork.
CO5	Judge the formwork failures through case studies

REFERENCES:

- Formwork for Concrete Structures, R.L.Pearlroy, McGraw Hill India, 2010.
- Formwork for Concrete Structures, Kumar Neeraj, Tata McGraw Hill Education, 2012.
- IS 14887, 1999: Formwork for Concrete Structures - Guidelines, BIS.
- Hurd, M.K., Formwork for Concrete, Special Publication No.4, American Concrete Institute, Detroit, 1996
- Michael P. Hurst, Construction Press, London and New York, 2003.

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OBJECTIVE:

- To develop an understanding of the philosophy of design of prestressed concrete
- To be able to design indeterminate prestressed concrete structure
- To design the prestressed concrete bridge and composite sections.

UNIT I INTRODUCTION

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Pre-stressed concrete compression and tension members – application in the design of prestressed pipes and prestressed concrete cylindrical water tanks – Design of compression members with and without flexure – its application in the design of piles, flag masts and similar structures – Two way pre-stressed concrete floor systems - Corrections for pre-stressed concrete elements, 9

UNIT V DESIGN OF PRESTRESSED CONCRETE BRIDGES

Review of IRC and IRS loadings, Effect of concentrated loads on deck slabs, load distribution methods for concrete bridges, Analysis and Design of superstructures - Design of pre-stressed concrete bridges incorporating long-term effects like creep, shrinkage, relaxation, and temperature effects, Dynamic response of bridge decks, 9

TOTAL: 45 PERIODS

OUTCOMES:

- On completion of the course, the student is expected to be able to

CO1	Identify the various methods of prestressing and estimate the loss
CO2	Design the beams for flexure, shear, bond and torsion
CO3	Design the continuous beams and composite beams
CO4	Design the water tank, piles and masts
CO5	Analyze and design the prestressed concrete bridge

REFERENCES:

1. Arthur H. Nilson, "Design of Prestressed Concrete", John Wiley and Sons Inc, New York, 2004.
2. Krishna Raju, "Prestressed Concrete", Tata McGraw Hill Publishing Co., New Delhi, 6th Edition, 2018.
3. Lin.T.Y.and Burns.H "Design of Prestressed Concrete Structures", John Wiley and Sons Inc, 3rd Edition, 2010.
4. Rajagopalan.N, "Prestressed Concrete", Narosa Publications, New Delhi, 2014.
5. Sinha.N.C.and.Roy.S.K, "Fundamentals of Prestressed Concrete", S.Chand and Co., 1998.
6. Johnson Victor, D., Essentials of Bridge Engineering, Oxford and IBH Publishing Co., New Delhi, 2019.


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19255E53DP

DESIGN OF STEEL -CONCRETE COMPOSITE STRUCTURES

L T P C
3 0 0 3

OBJECTIVE:

- To develop an understanding of the behaviour and design concrete composite elements and structures.

UNIT I INTRODUCTION

Introduction to steel – concrete composite construction – Codes – Composite action –Serviceability and Construction issues in design. 9

UNIT II DESIGN OF COMPOSITE MEMBERS

Design of composite beams, slabs, columns, beam – columns - Design of composite trusses. 9

UNIT III DESIGN OF CONNECTIONS

Shear connectors – Types – Design of connections in composite structures – Design of shear connectors – Partial shear interaction. 9

UNIT IV COMPOSITE BOX GIRDER BRIDGES

Introduction –Design concepts of box girder bridges and corrugated web girder bridges. 9

UNIT V CASE STUDIES

Case studies on steel – concrete composite construction in buildings – seismic behaviour of composite structures. 9

TOTAL: 45 PERIODS

OUTCOMES:

- On completion of the course, the student is expected to be able to

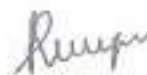
CO1	Explain composite action
CO2	Design composite elements
CO3	Design connections
CO4	Explain the concept of design of composite box girder bridges
CO5	Study and evaluate case studies

REFERENCES:

- Johnson R.P., "Composite Structures of Steel and Concrete Beams, Slabs, Columns and Frames for Buildings", Vol. 1, Fourth Edition, Blackwell Scientific Publications, 2018
- Oehlers D.J. and Bradford M.A., "Composite Steel and Concrete Structural Members: Fundamental behaviour" Revised Edition, Pergamon press, Oxford, 2013.
- Owens, G.W and Knowles, P., "Steel Designers Manual", Seventh Edition, Steel Concrete Institute(UK), Oxford Blackwell Scientific Publications, 2011.
- Narayanan R., "Composite steel structures – Advances, design and construction", Elsevier, Applied science, UK, 1987


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DESIGN OF SHELL AND SPATIAL STRUCTURES

L T P C
3 0 0 3

OBJECTIVE:

- To study the behaviour and design of shells, folded plates, space frames and application of FORMIAN software.

UNIT I	CLASSIFICATION OF SHELLS	9
Classification of shells, types of shells, structural action, - Design of circular domes, conical roofs, circular cylindrical shells by ASCE Manual No.31.		
UNIT II	FOLDED PLATES	9
Folded Plate structures, structural behaviour, types, design by ACI - ASCE Task Committee method - pyramidal roof- Prismatic roof.		
UNIT III	INTRODUCTION TO SPACE FRAME	9
Space frames - configuration - types of nodes - Design Philosophy - Behaviour.		
UNIT IV	ANALYSIS AND DESIGN	9
Analysis of space frames - Design of Nodes - Pipes - Space frames - Introduction to Computer-Aided Design		
UNIT V	SPECIAL METHODS	9
Application of Formex Algebra, FORMIAN for generation of configuration.		
		TOTAL: 45 PERIODS

OUTCOMES:

On completion of this course, the student is expected to be able to

CO1	Explain the different forms of shells and design the domes and shells.
CO2	Evaluate the structural behaviour and design of folded plate structures.
CO3	Explain the various functional configurations of space frames.
CO4	Design of space frames and apply the knowledge of CAD for the analysis of space structures.
CO5	Analyse the configurations of space structures using FORMIAN software.

REFERENCES

- Billington, D.P., "Thin Shell Concrete Structures", McGraw Hill Book Co., New York, ASCE Manual No.31, Design of Cylindrical Shells, 1982.
- Varghese, P.C., Design of Reinforced Concrete Shells and Folded Plates, PHI Learning Pvt. Ltd., 2010.
- Subramanian, N., "Space Structures: Principles and Practice", Multi-Science Publishing Co. Ltd. 2008.
- Ramasamy, G.S., "Analysis, Design and Construction of Steel Space Frames", Thomas Telford Publishing, 2002.
- Wilby, C "Concrete Folded Plate Roofs", Elsevier, 1998



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**ANNEXURE II
VALUE ADDED COURSES**

3D PRINTING TECHNOLOGY FOR CIVIL ENGINEERING

S.No	Topics	Minimum
1.	Introduction of 3D Printing Technology	5hrs
2.	Problems Facing the Construction Industry	5hrs
3.	Construction 3D Printing Basics	5hrs
4.	Comparing Construction Methods	5hrs
5.	Automating Masonry	5hrs
6.	On-Site Printing	5hrs
7.	Various printing Technologies Explained	5hrs
8.	On – Site Mixing Systems	5hrs
9.	Economic breakdown	5hrs

Duration of the Course: 45 hours

Learning outcomes:

1. Use software tools for 3D Printing
2. Prepare 3D printed modules
3. Construct products using LOM and FDM technologies
4. To create and edit Pipe Networks and use Plan Production tools

BIM FUNDAMENTALS FOR ENGINEERS

S.No	Topics	Minimum
1.	Prepare for the Class.	5hrs
2.	Fundamental BIM Knowledge.	5hrs
3.	View & Retrieve Information from BIM Models.	5hrs
4.	Collaboration With CAD Drawings, Project Budget Calculation With Scheduled 3D Model.	5hrs
5.	Multiple 3D Models for Different Project Teams on a digital platform.	5hrs
6.	Additional Information of Time With shared 3D Model.	5hrs
7.	Project Budget Calculation With Scheduled 3D Model.	5hrs
8.	Modeling a BIM Model.	5hrs
9.	Closure.	5hrs
	Total Hours	45 hrs

Duration of the Course: 45 hours

Learning outcomes:

1. The learning process is mainly organized around theoretical classes.
2. Rendered production of 2D drawings and representations in different detail levels.
3. Attend on the given topics and abilities from these courses are directly transferred.

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4. To design studies in various levels and construction project courses.

FIRE PROTECTION, SERVICES AND MAINTENANCE

S.No	Topics	Minimum
1	Fire Protection: Process of combustion in fire, Effect of fire load & ventilation condition on enclosure fire, growth and decay of fire in enclosure	5hrs
2	Concepts of fire resistant and severity, Effect of fire on materials, Simple Design of elements for given fire resistance.	5hrs
3	Planning, Fire detection & suppression systems, Smoke venting	5hrs
4	Lifts & Vertical Transportation: arrangement of lifts and Design for optimum service condition.	5hrs
5	Building Services as a system, Capacity of storage and sizing, control system etc. & intelligent building.	5hrs
6	Water Supply, Hydraulic design, Storage Distribution, Component of cold & hot water supply system.	5hrs
7	Waste water & Drainage systems: Fixture units & Design of system and elements of electrical services.	5hrs
8	Planned maintenance: Planning maintenance, schedule & contingency maintenance, levels of planning, planned inspection, etc	5hrs
9	Effect of design on maintenance, Diagnosis, appraisal, structural defects & various methods of repair	5hrs

Duration of the Course: 45 hours

Learning outcomes:

1. Apply strategies, tactics and Incident Command/Incident Management skills to emergency incidents.
2. Application of management and leadership principles to Fire Department operations, Inter-agency Co operation and implementation of policies and procedures
3. Development of skills and education for employment and advancement in Fire and Emergency Services

RIVER ENGINEERING

S.No	Topics	Minimum
1.	Physical Properties and Equations.	5hrs
2.	Steady Flow in Rivers.	5hrs
3.	Unsteady Flow in Rivers.	5hrs
4.	River Equilibrium.	5hrs
5.	River Dynamics.	5hrs
6.	River Stabilization and River Training Work.	5hrs
7.	River Engineering.	5hrs
8.	River Modelling.	5hrs
9.	Multi Dimensional River Models.	5hrs

Duration of the Course: 45hours

Learning outcomes:

1. River engineering trainings can help you learn about river ecology, hydrological and hydraulic processes, and river restoration.

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2. River ecology: How urbanization and land-use changes can harm aquatic systems and river health.
3. Hydrological and hydraulic processes: How these processes work in rivers.
4. River restoration: How to manage and restore urban rivers to mitigate the effects of urbanization.



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