ACADEMIC YEAR
2021 – 2022

PRIST
DEEMED TO BE
UNIVERSITY
NAAC ACCREDITED
THANJAVUR- 613 403 - TAMIL NADU

INDEX

ACADEMIC YEAR – 2021-2022

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SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF MECHANICAL ENGINEERING

Date: 21/04/2021

MINUTES OF THE MEETING

The Meeting of the Board of Studies was held online on 21.04.2021 at 1.00 PM.

Members Present (Internal & External):

S.No	Name of the Member	Designation	Role
1	Dr.S.Dhanuskodi	Professor	Chairperson
2	Dr.C.Sathiya Narayanan	Associate Professor, NIT,TRICHY	External Member
3	Er.S.Marimuthu	Deputy Manger, Stock verification Wing, BHEL, Trichy.	External Member
4	Dr.T.V.Christy	Professor	Internal Member
5	Dr.V.Yalini	Associate Professor	Internal Member
6	M.Abdul Ghani Khan	Associate Professor	Internal Member
7	S.P.Kalaiselvan	Associate Professor	Internal Member
8	S.V.Sridhar	Associate Professor	Internal Member
9	R.Tamizh Selvan	Assistant Professor	Internal Member
10	P.Vijayakumar	Assistant Professor	Internal Member
11	R.Baskaran	Assistant Professor	Internal Member
12	K.Purushothaman	Assistant Professor	Internal Member
13	M.Sudhahar	Assistant Professor	Internal Member
14	P.Sarath Kumar	Assistant Professor	Internal Member
15	N.Sivaharinathan	Assistant Professor	Internal Member
16	J.Rajesh	Assistant Professor	Internal Member
17	G.Arunkumar	Assistant Professor	Internal Member
18	G.Brithiviraj	Assistant Professor	Internal Member
19	J.Selvamani	Assistant Professor	Internal Member

- ✓ The Chairman, Board of Studies welcomed the members and briefed about the existing curriculum and syllabi for various programmes offered by the Department and also the details of feedback on curriculum received from the various stake holders.

- ✓ After thorough scrutiny of the curriculum and Syllabi and the details of feedback on curriculum received from the Stake holders, the members of the Board have unanimously passed the following resolutions:

- ✓ Resolved to revise the B.Tech – Mechanical Engineering – FT curriculum with effect from 2021-2022
- ✓ The details of new curriculum and syllabi are given in the annexure 1.
- ✓ The following changes are made in the new curriculum.

Inclusion of New Courses in B.TECH (FT) – (R-2021)

1. Professional English - I
2. Engineering Physics
3. Communication Laboratory- I
4. Professional English - II
5. Materials Science
6. Professional development
7. Human Values and Ethics
8. Mechatronics and IoT
9. Mechatronics and IoT lab
10. CAD/CAM
11. Value Engineering
12. Product Life Cycle Management
13. Smart Mobility and Intelligent Vehicles
14. Electrical Drives and Actuators
15. Design Concepts in Engineering
16. Dynamics of Ground Vehicles
17. Thermal Power Engineering
18. Turbo Machines
19. Material Handling and solid processing Equipment
20. Thermal and Fired Equipment design
21. Design Codes and Standards
22. Energy Conservation in Industries
23. Bioenergy Conversion Technologies
24. IoT Concepts and Applications
25. Augmented and Virtual Reality
26. Artificial Intelligence and Machine Learning Fundamentals
27. Data Science Fundamentals
28. Introduction to NDT
29. Industrial Management
30. Industrial Safety
31. Additive Manufacturing

Change of Course Content in B.TECH (FT) – (R-2021)

1. Matrices and Calculus
2. Engineering Chemistry
3. Problem Solving and Python Programming
4. Engineering Thermodynamics
5. Theory of Machines
6. Environmental Sciences and Sustainability

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 Solid Works
2. Certificate Course on Marine Construction and Welding
3. Certificate Course on Mechatronics in Automobile Sector
4. Certificate Course on Electric Bike

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 Board of Studies Chairman

Signature of the members:

S.No	Name of the Member	Role	Signature
1)	Dr.S.Dhanuskodi	Chairperson	
2)	Dr.C.Sathiya Narayanan	External Member	
3)	Er.S.Marimuthu	External Member	
4)	Dr.T.V.Christy	Internal Member	Granted leave of absence*
5)	Dr.V.Yalini	Internal Member	
6)	M.Abdul Ghani Khan	Internal Member	
7)	S.P.Kalaiselvan	Internal Member	
8)	S.V.Sridhar	Internal Member	Granted leave of absence*

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

Video call link: https://meet.google.com/fkk-tvfh-xma

*** Oral Inputs Received**

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

Annexure-I

Student Induction Training

The *Induction Program* is designed to make the newly joined students feel comfortable, sensitize them towards exploring their academic interests and activities, reducing competitionandmakingthemworkforexcellence,promotebondingwithinthem,buildrelations betweenteachersandstudents,giveabroaderviewoflife,andbuildingofcharacter.

Induction program	**3 weeks duration**
Induction program for students to be offered right at the start of the first year.	• Physicalactivity • CreativeArts • Universal HumanValues • Literary • ProficiencyModules • Lectures by EminentPeople • Visits to localAreas • Familiarization to Dept./Branch &Innovations

The activities during the Induction Program would have an Initial Phase, a Regular Phase and a Closing Phase. The Initial and Closing Phases would be two days each.

Course on Indian Constitution

Aim:

- To understandthe salient features of the Indian Constitution

Objectives:

- To make the students understand about the Democratic Rule and Parliamentarian Administration.
- To appreciate the salient features of the Indian Constitution.
- To know the fundamental Rights and Constitutional Remedies.
- 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.

Outcomes

- Democratic values and citizenship Training are gained.
- Awareness on Fundamental Rights are established.
- The functions of union Government and State Governments are learnt.
- The power and functions of the Judiciary learnt thoroughly.
- Appreciation of Democratic Parliamentary Rule is learnt.

UNIT I: The Making OfIndianconstitution

The Constituent 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

Socialism Principles – Gandhian Principles – Liberal and General Principles – Differences between Fundamental Rights and Directive principles.

UNIT IV: The Union Executive, UnionparliamentAnd Supreme Court

Powers and positions of the President – Qualification Method of Election of President and vice president – Prime Minister RajyaSabha- LokSabha – The Supreme Court – High Court – Functions and position of Supreme court and High Court.

UNIT V: State Council – Election System AndPartliamentary 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. AiyerAlladi, Krishnaswami, Constitution and fundamental rights 1955.
3. Markandan K.C. Directive Principles in the Indian Constitution 1966.
4. KashyapSubash C Our Parliament, National Book, Trust New Delhi 1989.

INTRODUCTION TO GENDER STUDIES

COURSE OUTLINE

Unit-I Concepts
Sex vs. Gender, masculinity, femininity, socialization, patriarchy, public/ private, essentialism, binaryism, power, hegemony, hierarchy, stereotype, gender roles, gender relation, deconstruction, resistance, sexual division of labour.

Unit-II
Feminist Theory
Liberal, Marxist, Socialist, Radical, Psychoanalytic, postmodernist, eco-feminist.

Unit-III
Women's Movements: Global, National and Local
Rise of Feminism in Europe and America.
Women's Movement in India.

Unit-IV
Gender and Language
Linguistic Forms and Gender.
Gender and narratives.

Unit-V
Gender and Representation
Advertising and popular visual media.
Gender and Representation in Alternative Media.
Gender and social media.

Community Engagement

a) **Objectives:**

- To developanappreciationofruralculture,life-styleandwisdomamongststudents
- Tolearnaboutthestatusofvariousagriculturalandruraldevelopmentprogrammes
- Tounderstandcausesforruraldistressandpovertyandexploresolutionsforthesame
- To apply classroom knowledge of courses to field realities and therebyimprove quality of learning

b) **Learning Outcomes:**

After completing this course, student will be able to

- Gain an understanding of rural life, culture and socialrealities
- Developasenseofempathyandbondsofmutualitywithlocalcommunity
- Appreciatesignificantcontributionsoflocalcommunitiestoindiansocietyandeconomy
- Learntovaluethelocalknowledgeandwisdomofthecommunity
- Identify opportunities for contributing to community's socio-economicimprovements

c) **Credit**

2 credit, 30 hours, at least 50% in field, compulsory for all students

d) **Contents**

Divided into four Modules, field immersion is part of each Unit

CourseStructure:2CreditsCourse(1CreditforClassroomandTutorialsand1Creditfor FieldEngagement)

S. No.	Module Title	Module Content	Assignment	Teaching/ Learning Methodology	No. of Classes
1	Appreciation of Rural Society	Ruralllifestyle,rural society, caste and gender relations, rural values with respect to community, nature and resources, claboration of"soul of India lies in villages' (Gandhi), ruralinfrastructure	Prepare a map (physical, visual or digital) of the village youvisited andwriteanessay about inter-family relations in that village.	- Classroom discussions - Fieldvisit ** - Assignment Map	2 4 2
2	*Understanding rural economy & livelihood*	Agriculture, farming, landownership, water management, animal husbandry, non-farm livelihoods and artisans, rural entrepreneurs, rural markets	Describe your analysis of rural household economy,its challenges and possible pathways to address them	- Fieldvisit ** - Group discussions in class - Assignment	3 4 1
3	*Rural Institutions*	Traditional rural organisations, Self-help Groups, Panchayati raj institutions (Gram Sabha, Gram Panchayat, Standing Committees), local civil society, local administration	How effectively are Panchayati rajinstitutions functioning in the village?What wouldyousuggest to improve their effectiveness? Present a case study (written or audio-visual)	- Classroom - Fieldvisit ** - Group presentation ofassignment	2 4 2 -

4	*Rural Development Programmes*	History of rural development in India, current national programmes: SarvaShikshaAbhiyan, BetiBachao, BetiPadhao, Ayushman Bharat, Swatchh Bharat, PM AwaasYojana, Skill India, Gram PanchayatDecentralised Planning, NRLM, MNREGA, etc.	Describe the benefits received and challenges faced in the delivery of one of these programmes in the rural community; give suggestions about improving implementation of the programme for the rural poor.	- Classroom - Each student selects one program for field visit** - Written assignment	2 4 2

INNOVATION AND ENTREPRENEURSHIP

Course Outcomes

After the completion of the course, the students will be able to:

- Comprehend the role of bounded rationality, framing, causation and effectuation in entrepreneurial decisionmaking.
- Demonstrate an ability to design a business modelcanvas.
- Evaluate the various sources of raising finance for startupventures.
- Understand the fundamentals of developing and presenting business pitching to potential investors.

Course Content

Module – I

Introduction to Entrepreneurship: Entrepreneurs; entrepreneurial personality and intentions-characteristics, traits and behavioral; entrepreneurial challenges.

Module-II

Module Entrepreneurial Opportunities: Opportunities. discovery/ creation, Pattern identification and recognition for venture creation: prototype and exemplar model, reverse engineering.

Module –III

Entrepreneurial Process and Decision Making: Entrepreneurial ecosystem, Ideation, development and exploitation of opportunities; Negotiation, decision making process and approaches, Effectuation and Causation.

Module-IV

Crafting business models and Lean Start-ups: Introduction to business models; Creating value propositions-conventional industry logic, value innovation logic; customer focused innovation; building and analyzing business models; Business model canvas, Introduction to lean startups, Business Pitching.

Module – V

Organizing Business and Entrepreneurial Finance: Forms of business organizations; organizational structures; Evolution of Organisation, sources and selection of venture finance options and its managerial implications.Policy Initiatives and focus; role of institutions in promoting entrepreneurship.

Books for References

- *Ries, Eric(2011). The lean Start-up: How constant innovation creates radically successful businesses, Penguin BooksLimited.*
- *Blank, Steve (2013), The Startup Owner's Manual: The Step by Step Guide for Building a Great Company, K&S Ranch.*
- *S. Carter and D. Jones-Evans, Enterprise and small business- Principal Practice and Policy, Pearson Education(2006)*
- *T. H. Byers, R. C. Dorf, A. Nelson, Technology Ventures: From Idea to Enterprise, McGraw Hill(2013)*
- *Osterwalder, Alex and Pigneur, Yves (2010) Business ModelGeneration.*
- *Kachru, Upendra, India Land of a Billion Entrepreneurs,Pearson*
- *Bagchi, Subroto, (2008), Go Kiss the World: Life Lessons for the Young Professional, PortfolioPenguin*
- *Bagchi, Subroto. (2012). MBA At 16: a Teenager's Guide to Business, PenguinBooks*
- *Bansal, Rashmi, Stay Hungry Stay Foolish, CIIE, IIMAhmedabad*
- *Bansal, Rashmi, (2013). Follow Every Rainbow,Westland.*
- *Mitra, Sramana (2008), Entrepreneur Journeys (Volume 1), BooksurgePublishing*
- *Abrams, R. (2006). Six-week Start-up, Prentice-Hall of India.*
- *Verstraete, T. and Laffitte, E.J. (2011). a Business Model of Entrepreneurship, Edward ElgarPublishing.*
- *Johnson, Steven (2011). Where Good Ideas comes from, Penguin BooksLimited.*
- *Gabor, Michael E. (2013), Awakening the Entrepreneur Within,Primento.*
- *Guillebeau, Chris (2012). The $100 startup: Fire your Boss, Do what you love and work better to live more, Pan Macmillan*
- *Kelley, Tom (2011). The ten faces of innovation, CurrencyDoubleday*

Prasad, Rohit (2013). Start-up sutra: what the angels won't tell you about business and life, HachetteIndia.

PROFESSIONAL ETHICS AND HUMAN VALUES

OBJECTIVE:

- To enable the students to create an awareness on Engineering Ethics and Human Values, to instill Moral and Social Values and Loyalty and to appreciate the rights of others.

UNIT I HUMAN VALUES

Morals, values and Ethics – Integrity – Work ethic – Service learning – Civic virtue – Respect for others – Living peacefully – Caring – Sharing – Honesty – Courage – Valuing time – Cooperation – Commitment – Empathy – Self confidence – Character – Spirituality – Introduction to Yoga and meditation for professional excellence and stress management.

UNIT II ENGINEERING ETHICS

Senses of _Engineering Ethics' – Variety of moral issues – Types of inquiry – Moral dilemmas – Moral Autonomy – Kohlberg's theory – Gilligan's theory – Consensus and Controversy – Models of professional roles - Theories about right action – Self-interest – Customs and Religion – Uses of Ethical Theories.

UNIT III ENGINEERING AS SOCIAL EXPERIMENTATION

Engineering as Experimentation – Engineers as responsible Experimenters – Codes of Ethics – A Balanced Outlook on Law.

UNIT IV SAFETY, RESPONSIBILITIES AND RIGHTS

Safety and Risk – Assessment of Safety and Risk – Risk Benefit Analysis and Reducing Risk - Respect for Authority – Collective Bargaining – Confidentiality – Conflicts of Interest – Occupational Crime – Professional Rights – Employee Rights – Intellectual Property Rights (IPR)– Discrimination.

UNIT V GLOBAL ISSUES

Multinational Corporations – Environmental Ethics – Computer Ethics – Weapons Development – Engineers as Managers – Consulting Engineers – Engineers as Expert Witnesses and Advisors – Moral Leadership –Code of Conduct – Corporate Social Responsibility.

OUTCOMES:

- Upon completion of the course, the student should be able to apply ethics in society, discuss the ethical issues related to engineering and realize the responsibilities and rights in the society.

TEXT BOOKS:

1. Mike W. Martin and Roland Schinzinger, — Ethics in Engineeringl, Tata McGraw Hill, New Delhi, 2003.
2. Govindarajan M, Natarajan S, Senthil Kumar V. S, — Engineering Ethicsl, Prentice Hall of India, New Delhi, 2004.

REFERENCES:

1. Charles B. Fleddermann, —Engineering Ethicsl, Pearson Prentice Hall, New Jersey, 2004.
2. Charles E. Harris, Michael S. Pritchard and Michael J. Rabins, —Engineering Ethics – Concepts and Casesl, Cengage Learning, 2009.
3. John R Boatright, —Ethics and the Conduct of Businessl, Pearson Education, New Delhi, 2003
4. Edmund G Seebauer and Robert L Barry, —Fundamentals of Ethics for Scientists and Engineersl, Oxford University Press, Oxford, 2001.
5. Laura P. Hartman and Joe Desjardins, —Business Ethics: Decision Making for Personal Integrity and Social Responsibilityl McGraw Hill education, India Pvt. Ltd.,New Delhi, 2013.
6. World Community Service Centre, _ Value Education', Vethathiri publications, Erode, 2011.

Web sources:

www.onlineethics.org www.nspe.orgwww.global.orgwww.ethics.org

Annexure-II

Year I: Basic Behavioral Etiquette-2 credits

Year II: Technical, General Aptitude and Skill set Development-2 credits

Year III: Technical Training-2 credits

Year IV: Interview Skills Training and Mock Test -2 credits

Annexure-III

BTech – MECHANICAL ENGINEERING - Specialization in Internet of Things							
S. No.	Year	Semester	Course Name	L	T	P	C
1	1st	II	IT Infrastructure Landscape Overview	2	0	0	2
2	1st	II	Introduction to Internet of Things (IOT)	3	0	0	3
3	2nd	III	Python Programming	3	0	2	4
4	2nd	III	Sensor Technology & Instrumentation	3	0	2	4
5	2nd	IV	Wireless Sensor Networks (WSN) &IoT Standards	3	0	2	4
6	3rd	V	Embedded Technology for IOT	3	0	2	4
7	3rd	VI	Analytics for IOT	3	0	2	4
8	3rd	VI	IOT Enterprise Solution Architecture	3	0	4	5
9	4th	VII	IOT for Industries (Use Case Scenarios)	3	0	2	4
	4th	VIII	Project				

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SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF MECHANICAL ENGINEERING

COURSE STRUCTURE

B.Tech – FULL TIME

[Regulation 2021]

(For Candidates admitted from 2022 onwards)

PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

I. Effectuating success in careers by exploring with the design, digital and computational analysis of engineering systems, experimentation and testing, smart manufacturing, technical services, and research.

II. Amalgamating effectively with stakeholders to update and improve their core competencies and abilities to ethically compete in the ever-changing multicultural global enterprise.

III. To encourage multi-disciplinary research and development to foster advanced technology, and to nurture innovation and entrepreneurship in order to compete successfully in the global economy.

IV. To globally share and apply technical knowledge to create new opportunities that proactively advances our society through team efforts and to solve various challenging technical, environmental and societal problems.

V. To create world class mechanical engineers capable of practice engineering ethically with a solid vision to become great leaders in academia, industries and society.

PROGRAM OUTCOMES (POs)

PO	GRADUATE ATTRIBUTE
1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2	**Problem analysis**: Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3	**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.
4	**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.
5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.
6	**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.
7	**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.
8	**Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9	**Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10	**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.
11	**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.
12	**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.

PROGRAM SPECIFIC OUTCOMES (PSOs)

On successful completion of the Mechanical Engineering Degree programme, the Graduates shall exhibit the following:

1. Apply the knowledge gained in Mechanical Engineering for design and development and manufacture of engineering systems.
2. Apply the knowledge acquired to investigate research-oriented problems in mechanical engineering with due consideration for environmental and social impacts.
3. Use the engineering analysis and data management tools for effective management of multidisciplinary projects.

PEO / PO MAPPING:

PEOs	POs												PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
I.	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
II.	3	2	2	2	2	1	1	1	3		2	1	2	3	3
III.	3	1	2	1	2	2	1		1	2		3	3	2	2
IV.	2	2	2	2	2		2				1	2	2	3	3
V.	3	2	2	2	1	3	2	2	2	1	1	3	3	2	2

Mapping of Course Outcome and Programme Outcome

Year	Semester	Course name	PO												PSO		
			1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
I	I	Professional English- I	1.6	2.2	1.8	2.2	1.5	3	3	3	1.6	3	3	3			
		Matrices and Calculus	3	3	1	1	0	0	0	0	2	0	2	3	-	-	-
		Engineering Physics	3	3	1.6	1.2	1.8	1	-	-	-	-	-	1	-	-	-
		Engineering Chemistry	2.8	1.3	1.6	1	-	1.5	1.8	-		-	-	1.5	-	-	-
		Problem Solving and Python Programming	2	3	3	3	2	-	-	-	-	-	2	2	3	3	-
		Problem Solving and Python Programming Laboratory	2	3	3	3	2	-	-	-	-	-	2	2	3	3	-
		Physics and Chemistry Laboratory	3	2.4	2.6	1	1	-	-	-	-	-	-	-	-	-	-
			2.6	1.3	1.6	1	1	1.4	1.8	-	-	-	-	1.3	-	-	-
		English Laboratory[5]	3	3	3	3	1	3	3	3	3	3	3	3	-	-	-
	II	Professional English- II	3	3	3	3	2.75	3	3	3	2.2	3	3	3	-	-	-
		Statistics and Numerical Methods	3	3	1	1	1	0	0	0	2	0	2	3	-	-	-
		Materials Science	3	2	1.6	1.4	1.8	1.2	1	-	-	-	-	1	-	-	-
		Basic Electrical and Electronics Engineering	2	1.8	1					1				2			1
		Engineering Graphics	3	1	2	-	2	-	-	-	-	3	-	2	2	2	-
		Engineering Practices Laboratory	3	2	-		1	1	1	-	-	-	-	2	2	1	1
		Basic Electrical and Electronics Engineering Laboratory	3	3	2	1	1	-	-	1.5	2	-	-	-	-	-	1
		Communication Laboratory / Foreign Language[6]	2.4	2.8	3	3	1.8	3	3	3	3	3	3	3	-	-	-
II	III	Transforms and Partial Differential Equations	3	3	2	2	1	-	-	-	1	-	-	1	3	3	1
		Engineering Mechanics	3	2	3	1	2	-	-	-	-	-	-	2	3	1	2
		Engineering Thermodynamics	3	3	2			1			1		1	2	3	2	3
		Fluid Mechanics and Machinery	3	2	3	2	2	2	2	1	-	-	-	2	2	2	2
		Engineering Materials and Metallurgy	3	1	3	2	2	2	2	1	-	-	-	2	2	1	2
		Manufacturing Processes	3		2		2	2	2	1	1	-	-	1	3	1	2
		Professional Development	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	IV	Theory of Machines	3	2	2		2	-	-	1		-	-	1	3		1
		Thermal Engineering	3	2	1	1	-	-	-	-	-	-	-	1	2	1	1
		Hydraulics and Pneumatics	2	1	1	1	-	-	-	-	-	-	-	1	2	1	1
		Manufacturing Technology	3	3	3	1	1	1	3	-	-	3	-	-	3	2	2
		Strength of Materials	3	3	3	3	2	3	1	3	2	3	1	3	2	1	1

SEMESTER I

S.NO.	COURSE CODE	COURSE TITLE	L	T	P	C
THEORY						
1.	21147IP	INDUCTION PROGRAM	2-WEEKS			
2.	21147S11	Professional English - I	3	0	0	3
3.	21148S12	Matrices and Calculus	3	1	0	4
4.	21149S13	Engineering Physics	3	0	0	3
5.	21149S14	Engineering Chemistry	3	0	0	3
6.	21150S15	Problem Solving and Python Programming	3	0	0	3
PRACTICAL						
7.	21150L16	Problem Solving and Python Programming Laboratory	0	0	4	2
8.	21149L17	Physics and Chemistry Laboratory	0	0	4	2
9	21147L18	Communication Laboratory- I	0	0	2	1
TOTAL			15	1	10	21

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SEMESTER II

S.NO.	COURSE CODE	COURSE TITLE	L	T	P	C
		THEORY				
1.	21147S21	Professional English - II	3	0	0	3
2.	21148S22	Statistics and Numerical Methods	3	1	0	4
3	21149S23D	Materials Science	3	0	0	3
4.	21154S24	Engineering Graphics	2	0	4	4
5.	21153S25A	Basic Electrical and Electronics Engineering	3	0	0	3
		PRACTICAL				
6.	21154L27	Engineering Practices Laboratory	0	0	4	2
7.	21153L28C	Basic Electrical and Electronics Engineering Laboratory	0	0	4	2
8.	21147L29	Communication Laboratory - II	0	0	4	2
		TOTAL	14	1	16	23

SEMESTER III

S.NO.	COURSE CODE	COURSE TITLE	L	T	P	C
		THEORY				
1.	21148S31D	Transforms and Partial Differential Equations	3	1	0	4
2.	21154C32	Engineering Mechanics	3	0	0	3
3.	21154C33	Engineering Thermodynamics	3	0	0	3
4.	21154C34	Fluid Mechanics and Machinery	2	1	0	3
5.	21154C35	Engineering Materials and Metallurgy	3	0	0	3
6	21154C36	Manufacturing Processes	3	0	0	3

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PRACTICAL						
7.	21154L37	Computer Aided Machine Drawing	0	0	4	2
8.	21154L38	Manufacturing Technology Laboratory	0	0	4	2
9.	21154L39	Professional Development (**only internal marks)**	0	0	2	1
TOTAL			**17**	**2**	**10**	**24**

SEMESTER IV

S.NO.	COURSE CODE	COURSE TITLE	L	T	P	C
THEORY						
1.	21154C41	Theory of Machines	3	0	0	3
2.	21154C42	Thermal Engineering	3	1	0	4
3.	21154C43	Hydraulics and Pneumatics	3	0	0	3
4.	21154C44	Manufacturing Technology	3	0	0	3
5.	21154C45	Strength of Materials	3	0	0	3
6.	21149S46	Environmental Sciences and Sustainability	3	0	0	3
PRACTICAL						
7.	21154L47	Strength of Materials and Fluid Machinery Laboratory	0	0	4	2
8.	21154L48	Thermal Engineering Laboratory	0	0	4	2
TOTAL			**18**	**1**	**8**	**23**

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SEMESTER V

S.NO.	COURSE CODE	COURSE TITLE	L	T	P	C
		THEORY				
1.	21154C51	Design of Machine Elements	3	1	0	4
2.	21154C52	Metrology and Measurements	3	0	0	3
3.	21154E53--	Elective I	3	0	0	3
4.	21154E54--	Elective II	3	0	0	3
5.	21154E55-	Elective III	3	0	0	3
6	21147MC51--	Mandatory Course-I **(Internal Assessment Only)**	3	0	0	0
		PRACTICAL				
6.	21154L57	Summer Internship (Company Certificate)	0	0	4	1
7.	21154L58	Metrology and Dynamics Laboratory	0	0	4	2
		TOTAL	18	1	8	19

SEMESTER VI

S.NO.	COURSE CODE	COURSE TITLE	L	T	P	C
		THEORY				
1.	2115--OE61--	Open Elective – I *	2	0	2	3
2.	21154C62	Heat and Mass Transfer	3	1	0	4
3.	21154E63--	Elective IV	3	0	0	3
4.	21154E64--	Elective V	3	0	0	3
5.	21154E65--	Elective VI	3	0	0	3
6.	21154E66--	Elective VII	3	0	0	3
7.	21147MC61--	Mandatory Course-II (Internal marks only)	3	0	0	0
		PRACTICAL				
8.	21154L68	CAD / CAM Laboratory	0	0	4	2
9.	21154L69	Heat Transfer Laboratory	0	0	4	2
		TOTAL	20	1	10	23

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SEMESTER VII

S.NO.	COURSE CODE	COURSE TITLE	L	T	P	C
THEORY						
1.	21147S71	Human Values and Ethics	3	0	0	3
2.	2115--OE72--	Open Elective – II *	2	0	2	3
3.	2115--OE73--	Open Elective – III	3	0	0	3
4.	2115--OE74--	Open Elective – IV	3	0	0	3
5.	21154C75	Mechatronics and IoT	3	0	0	3
6.	21154C76	Computer Integrated Manufacturing	3	0	0	3
7.	21154C77	Industrial Management	3	0	0	3
PRACTICAL						
8.	21154L79	Mechatronics and IoT Laboratory	0	0	4	2
9.	21154L80	Summer Internship (Company Certificate)	0	0	0	1
TOTAL			20	0	6	24

SEMESTER VIII

S.No.	COURSE CODE	COURSE TITLE	L	T	P	C
THEORY						
1.	21154PW	Project Work / Internship	0	0	20	10
TOTAL			0	0	20	10

Mandatory courses I

S.NO.	COURSE CODE	COURSE TITLE	L	T	P	C
1.	21147MC51A	Introduction to Women and Gender Studies	3	0	0	0
2.	21147MC51B	Elements of Literature	3	0	0	0
3.	21147MC51C	Film Appreciation	3	0	0	0
4.	21147MC51D	Disaster Management	3	0	0	0

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Mandatory courses II

S.NO.	COURSE CODE	COURSE TITLE	L	T	P	C
1.	21147MC61A	Well Being with traditional practices (Yoga, Ayurveda and Siddha)	3	0	0	0
2.	21147MC61B	History of Science and Technology in India	3	0	0	0
3.	21147MC61C	Political and Economic Thought for a Humane Society	3	0	0	0
4.	21147MC61D	State, Nation Building and Politics in India	3	0	0	0
5.	21147MC61E	Safety in Engineering Industry	3	0	0	0

.ELECTIVE – I (V SEMESTER)

S.NO.	COURSE CODE	COURSE TITLE	L	T	P	C
1.	21154E53A	CAD/CAM	3	0	0	3
2.	21154E53B	Value Engineering	3	0	0	3
3.	21154E53C	Product Life Cycle Management	3	0	0	3

ELECTIVE – II (V SEMESTER)

	COURSE CODE	COURSE TITLE	L	T	P	C
1.	21154E54A	Robotics	3	0	0	3
2.	21154E54B	Smart Mobility and Intelligent Vehicles	3	0	0	3
3.	21154E54C	Electrical Drives and Actuators	3	0	0	3

ELECTIVE – III (V SEMESTER)

Sl. No	COURSE CODE	COURSE TITLE	L	T	P	C
1.	21154E55A	Automobile Engineering	3	0	0	3
2.	21154E55B	Design Concepts in Engineering	3	0	0	3

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3.	21154E55C	Dynamics of Ground Vehicles	3	0	0	3

ELECTIVE – IV (VI SEMESTER)

Sl. No	COURSE CODE	COURSE TITLE	L	T	P	C
1.	21154E63A	Design of Transmission System	3	0	0	3
2.	21154E63B	Thermal Power Engineering	3	0	0	3
3.	21154E63C	Turbo Machines	3	0	0	3

ELECTIVE – V (VI SEMESTER)

Sl. No	COURSE CODE	COURSE TITLE	L	T	P	C
1.	21154E64A	Material Handling and solid processing Equipment	3	0	0	3
2.	21154E64B	Thermal and Fired Equipment design	3	0	0	3
3.	21154E64C	Design Codes and Standards	3	0	0	3
4.	21154E64D	Non-traditional Machining Processes	3	0	0	3

ELECTIVE – VI (VI SEMESTER)

Sl. No	COURSE CODE	COURSE TITLE	L	T	P	C
1.	21154E65A	Power Plant Engineering	3	0	0	3
2.	21154E65B	Energy Conservation in Industries	3	0	0	3
3.	21154E65C	Bioenergy Conversion Technologies	3	0	0	3

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ELECTIVE – VII (VI SEMESTER)

Sl. No	COURSE CODE	COURSE TITLE	L	T	P	C
1.	21154E66A	Gas Dynamics and Jet Propulsion	3	0	0	3
2.	21154E66B	Operational Research	3	0	0	3
3.	21154E66C	Process Planning and Cost Estimation	3	0	0	3

OPEN ELECTIVE– I (SEMESTER VI)

Sl. No	COURSE CODE	COURSE TITLE	L	T	P	C
1.	21150OE61A	IoT Concepts and Applications	3	0	2	4
2.	21150OE61B	Augmented and Virtual Reality	3	0	2	4

OPEN ELECTIVE– II (SEMESTER VII)

Sl. No	COURSE CODE	COURSE TITLE	L	T	P	C
1.	21150OE72A	Artificial Intelligence and Machine Learning Fundamentals	3	0	2	4
2.	21150OE72B	Data Science Fundamentals	3	0	2	4

OPEN ELECTIVE– III

Sl. No	DEPT	COURSE CODE	COURSE TITLE	L	T	P	C
1.	ENGLISH	21148OE73A	English for Competitive Examinations	3	0	0	3
2.	ECE	21152OE73A	Biomedical Instrumentation	3	0	0	3
3.		21152OE73B	Space Engineering	3	0	0	3
4.	EEE	21153OE73A	Renewable Energy Technologies	3	0	0	3
5.		21153OE73B	Fundamentals of Electronic Devices and Circuits	3	0	0	3
6.	MECH **	21154OE73A	Introduction to NDT	3	0	0	3
7.		21154OE73B	Industrial Management	3	0	0	3
8.	CIVIL	21155OE73A	Remote Sensing Concepts	3	0	0	3
9.		21155OE73B	Drinking Water Supply and Treatment	3	0	0	3

** Offered for other department only

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CGPA CREDITS

Semester	Core	Elective	Open Elective	Practical	INTERN SHIP	Project	Total
I	16	-	-	05	-	-	21
II	17	-	-	06	-	-	23
III	19	-	-	05	-	-	24
IV	19	-	-	04	-	-	23
V	07	09	-	02	01	-	19
VI	04	12	03	04	-	-	23
VII	12	-	09	02	01	-	24
VIII	-	-	-	-	-	10	10
TOTAL							167

TOTAL CGPA CREDITS : 167

*NOTE: Theory & practical course mark allocation: L T P C
2 0 2 3

COMPONENT	MARKS
Theory	100
Practical	100
Total	200

200 convert to 70marks + internal 30mark=100Marks

If the candidate either fail or absent in any one of the component (Theory or Practical), He/She should be considering as fail. He/She has to reappear both (Theory and Practical) components.

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DESIGN AND FABRICATION OF ELECTIC BIKE

UNIT: 1 -INTRODUCTION

History of Electric Bike- Future of Electric Bikes-Laws and Regulations Governing Electric Bikes, Global Market scenario General safety measurements, use of PPE, manufacturing -Basic electrical and electromagnetic concepts- checking of battery-making of series and parallel connections-appropriate use of tools and equipment.

UNIT: 2 -FUNDAMENTALS OF ELECTRIC BIKE PROPULSION

Electric Theory and Components -Mathematical Model of Bike Performance- Power Required Hill Climbing Power - Power to Overcome Wind Resistance - Coefficient of Drag of Shapes of Interest Projected Area of the Bike Rider- Power to Overcome Rolling Resistance- Power for Acceleration-Estimating Required Motor Power- Determining Propulsion Power.

UNIT: 3-E-BIKE DESIGN (FOR DEVELOPER)

Frame and Design- Choosing a Frame and Planning Your Design- Selecting a Frame Dos and Don'ts- Optimize Your EV- Standard Measurements and Formulas- EV Weight-Streamline Your EV (For Developer)- Aerodynamic Drag Force Defined- Choose the Lowest Coefficient of Drag- Relative Wind Contributes to Aerodynamic Drag- Wheel Well and Underbody Airflow

UNIT: 4-E-BIKE POWER SOURCE

Electric Power for Bikes- Batteries for Powering Electric Bikes- Battery Selection Uncertainties- Measured Energy Comparison in Electric Cars- Battery Types, Components, and Performance- Lead-Acid Battery-Its Limits for Electric Bike Propulsion- Nickel-Cadmium Batteries for Electric Bike Propulsion

UNIT: 5-MOTORS AND MOTOR CONTROLLERS

Fundamental Principles of Electric Motors- Brush-and-Commutator Motor- Induction Motors- Efficient Permanent Magnet Synchronous Motors- Motor Characteristics for Electric Bike Propulsion- Torque-Speed Characteristics- Motor Output Power- Gear Ratio Determination- Mathematical Method for Determining Gear Ratio- Identification of Motor faults.

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Syllabus for SolidWorks Course

Total Course Duration: 45 Hrs

Section A: Basics & Introduction

- Graphic User Interface
- System requirements
- Parametric design
- Basic part modeling
- Feature based modeling
- File Management
- Managing SolidWorks environment

Section B: Sketching with SolidWorks

- 2D Sketching
- Sketching entities and relations
- 3D Sketching
- Editing & its features
- Dimensions
- Sketch tool
- Mirror, Convert entity
- Move & Copy

Section C: Part Modeling

- Part Modeling
- Extrude and Cutextrude
- Revolve and Sweep
- View toolbar
- Creating Reference geometries
- Fillet and Chamfer
- Hole wizard
- Calculating weight/mass & other geometric properties
- Export / Import of CAD files

Section D: Advanced Part Modeling

- Adding ribs and draft
- Circular and rectangular pattern
- Shell and Boss feature
- Configuration and Design Tables
- Material Library & Assigning Material
- Library Features & Smart Fasteners
- Boolean operations

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Section E: Assembly Mode

- Getting started with Assembly
- Inserting components in assembly
- Top-Down Assembly
- Feature Manager Design tree & Symbols
- Hiding components & controlling transparency
- Sub Assemblies
- Using mates in assembly
- Use of Smart Fasteners
- Bottom -Up Assembly
- Interference detection and misalignment of holes
- Exploding assemblies and adding explode lines

Section F: Generating detail drawings from Model

- Drafting overview
- Drawing sheets and views
- Adding drawing views
- View settings and drawing properties
- Smart Dimensioning
- Annotations and Symbols
- Sheet Formats and Templates
- Ballooning for nomenclature
- Adding Bill of Material and tables
-

Section G: Surface Modeling / Sheet Metal

- Introduction to surfacing tools
- Sweep, Loft, Revolve, Offset etc.
- Filleting and trimming
- Utilization of Sheet Metal & forming tools

Section H: Add-on Modules

- Weldment
- Core & Cavity
- Pipe routing

OUTCOMES:

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

- Learn SolidWorks workflow
- Understand the basic types of SolidWorks, software used and their applications
- Select appropriate method for designing and modeling applications

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MARINE CONSTRUCTION AND WELDING

Objectives:

- Understand about different types of welding processes and equipments.
- Know about the special welding process.
- Study about metallurgy of welding.
- Acquire broader ideas about weldability of ferrous and non ferrous metals.
- Understand about welding economy and applications.

UNIT I METAL JOINING PROCESSES

Classification plastic welding, fusion welding, solid phase welding and sub classification. Study of power sources, electrodes, welding symbols - processes and applications: SMAW, GTAW, GMAW, electro gas welding and Electro Slag, resistance welding. Gas welding, oxy acetylene cutting, brazing and soldering.

UNIT II CASTING PROCESSES

Sand casting, pattern and core making, moulding process - sand properties, Gate cutting and allowances-melting furnaces – pit furnace and electric furnaces. Special casting processes – shell, investment, die casting – pressure and gravity types – squeeze casting - defects in casting

UNIT III FINISHING PROCESSES

Surface finishing processes: grinding processes, various types of grinders, work holding devices, grinding wheels and specification, selection of grinding wheels for specific applications – selection of cutting speed and work speed. Fine Finishing Process: Lapping, honing, and super finishing process, ship hull finishing.

UNIT IV METAL FORMING PROCESSES

Hot and cold working processes – rolling, forging, drawing and extrusion processes, bending, hot spinning, shearing, tube and wire drawing, cold forming, shot peening. Sheet metal working

UNIT V MACHINING PROCESSES

Drilling - classification, specification, cutters speed feed and description of parts parts-boring machines- classification, principle, parts- specification. Milling - classification, principle, parts- specification-operations. Shaper and Planer- Principle -parts -operations - CNC Machines

TOTAL : 45 PERIODS

OUTCOMES:

The students will be able

- To know the different welding process and select the appropriate process for different applications
- To have the knowledge of different casting process and select the appropriate process for different applications.
- To select the Grinding Wheel and process based on the surface finish required.
- To have the depth understanding of various hot working and cold working process.
- To select the appropriate machines or machines tools for different requirements .

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

MEETING OF BOARD OF STUDIES IN ELECTRONICS AND COMMUNICATION ENGINEERING (21.01.2021)

MINUTES OFTHEMEETING

The Meeting of Board of Studies in Electronics and Communication Engineering was held on 21.04.2021 (ONLINE) at 11.00 am under the Chairmanship of Prof.Dr.Smitha Elsa Peter. **(https://meet.google.com/paf-xnsm-fjr)**

The following Members attended the meeting:

S.No	Designation	Name
1	Chairperson/HoD	Dr. Smitha elsa peter
2	External Expert-Academic	Dr. Sishaj P. Simon
3	External Expert- Industry	Mr.K.Tamizhselvan
4	Professor	Dr. Smitha elsa peter
5	Professor	Dr. S. Devi
6	Associate Professor	Dr. N. Parvatham
7	Associate Professor	S. Lillypet
8	Assistant Professor	Dr.P.Geetha
9	Assistant Professor	A. Amudha
10	Special Invitee-Dean	Prof.R.Tamizhselvan
11	Special Invitee-Alumnus/Alumna	Santhosh K.
12	Special Invitee -Current student - UG or PG	Selvabharathy P.

Head Of The Department
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The Chairman, Head of the Institute in the Department of Electronics and Communication Engineering welcomed the members and briefed about the existing curriculum and syllabi for various programmes offered by the Department and discussed the details of feedback on curriculum received from the various stakeholders during the academic year 2020-21.

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After thorough scrutiny of the curriculum and Syllabi and the details of feedback on curriculum received from the Stakeholders during the Year 2020-21, the members of the Board have unanimously passed the following resolutions:

- Resolved to introduce few new courses in the curriculum with effect from AY 2021 – 22. The List of New courses introduced and changes in existing courses are attached in the ANNEXURES – I and ANNEXURES – II respectively.

- Resolved to continue with the existing curriculum without any change for the following Programmes for the Academic Year 2021-22:
  - M. Tech – Communication Systems – Full Time
  - B. Tech – ECE (Part Time)
  - M. Tech - Communication Systems (Part Time)

- Also it is discussed and decided by the board to introduce 4 new value added courses for the AY2021 – 22 as listed below.
  - ✓ LORA AND LORA WAN COMMUNICATION
  - ✓ INTRODUCTION TO VISUAL BASIC LABORATORY- SCILAB PROGRAMMING
  - ✓ EMBEDDED SYSTEM INTERFACING WITH ROBOTICS
  - ✓ MACHINE LEARNING TECHNIQUES

- The members of the board also scrutinized and updated the panel of examiners and recommended for the Academic Council for its approval.

The meeting was concluded with thanks from the Board of Studies Chairman

Head Of the Department
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B.TECH (FULL TIME) – ECE – R-2021

PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

PEO1: To provide the students with a strong foundation in the required sciences in order to pursue studies in Electronics and Communication Engineering.

PEO2: To gain adequate knowledge to become good professional in electronic and communication engineering associated industries, higher education and research.

PEO3: To develop attitude in lifelong learning, applying and adapting new ideas and technologies as their field evolves.

PEO4: 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.

PEO5: To inculcate in the students a professional and ethical attitude and an ability to visualize the engineering issues in a broader social context.

PROGRAM OUTCOMES (POs)

PO1: **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2: **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.

PO3: **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.

PO4: **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.

PO5: **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.

PO6: **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilitiesrelevant to the professional engineering practice.

PO7: **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.

PO8: **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10: **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.

PO11: **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.

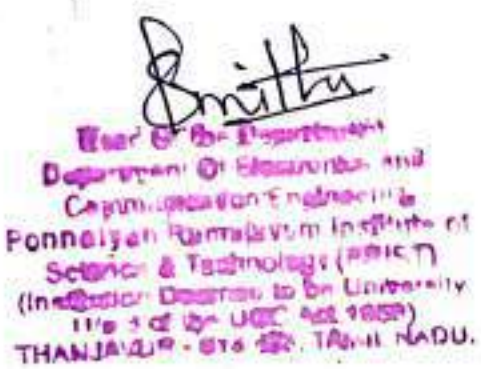
PO12: **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAM SPECIFIC OUTCOMES (PSOs)

PSO1: Design, develop and analyze electronic systems through application of relevant electronics, mathematics and engineering principles

PSO2: Design, develop and analyze communication systems through application of fundamentals from communication principles, signal processing, and RF System Design & Electromagnetics.

PSO3: Adapt to emerging electronics and communication technologies and develop innovative solutions for existing and newer problems



Signature of the members:

S.No	Designation	Name	Signature
1	Chairperson/HoD	Dr. Smitha elsa peter	
2	External Expert-Academic	Dr. Sishaj P. Simon	
3	External Expert- Industry	Mr.K.Tamizhselvan	
4	Professor	Dr. Smitha elsa peter	
5	Professor	Dr. S. Devi	
6	Associate Professor	Dr. N. Parvatham	
7	Associate Professor	S. Lillypet	
8	Assistant Professor	Dr.P.Geetha	
9	Assistant Professor	A. Amudha	
10	Special Invitee-Dean	Prof.R.Tamizhselvan	
11	Special Invitee-Alumnus/Alumna	SANTHOSH K.	
12	Special Invitee -Current student - UG or PG	SELVABHARATHY P.	

Head Of the Department
HOD/ECE
Department Of Electronics and Communication Engineering
Ponnaiyah Ramajayam Institute of Science & Technology (PRIST)
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DEAN
School of Engineering and Tech.
Ponnaiyah Ramajayam Institute of Science and Technology (PRIST)
Deemed to be University
Vallam, Thanjavur - 613 403.

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Ponnaiyah Ramajayam Institute of Science & Technology (PRIST)
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B.TECH (FULL TIME) – ECE – R-2021

I - VIII SEMESTERS CURRICULUM

SEMESTER I

Sl. No.	COURSE CODE	COURSE TITLE	L	T	P	C
		THEORY				
1.	21147IP	Induction Programme	-	-	-	0
2.	21147S11	Professional English - I	3	0	0	3
3.	21148S12	Matrices and Calculus	3	1	0	4
4.	21149S13	Engineering Physics	3	0	0	3
5.	21149S14	Engineering Chemistry	3	0	0	3
6.	21150S15	Problem Solving and Python Programming	3	0	0	3
		PRACTICALS				
7.	21150L16	Problem Solving and Python Programming Laboratory	0	0	4	2
8.	21149L17	Physics and Chemistry Laboratory	0	0	4	2
9.	21147L18	Communication Laboratory – I	0	0	2	1
		TOTAL	15	1	10	21

SEMESTER II

Sl. No.	COURSE CODE	COURSE TITLE	L	T	P	C
		THEORY				
1.	21147S21	Professional English – II	3	0	0	3
2.	21148S22	Statistics and Numerical Methods	3	1	0	4
3.	21149S23B	Physics for Electronics Engineering	3	0	0	3
4.	21154S24	Engineering Graphics	2	0	4	4
5.	21153S25B	Electrical and Instrumentation Engineering	3	0	0	3
6.	21153S26A	Circuit Analysis	3	1	0	4
		PRACTICALS				
7.	21154L21	Engineering Practices Laboratory	0	0	4	2

8.	21153L22A	Circuits Analysis Laboratory	0	0	4	2
9.	21147L23	Communication Laboratory – II	0	0	4	2
		TOTAL	17	2	16	27

SEMESTER III

Sl. No	COURSE CODE	COURSE TITLE	L	T	P	C
		THEORY				
1.	21148S31B	Random Processes and Linear Algebra	3	1	0	4
2.	21152S32	Control Systems	3	0	0	3
3.	21152S33	C Programming and Data Structures	3	0	0	3
4.	21152C34	Digital Systems Design	3	0	2	4
5.	21152C35	Signals and Systems	3	1	0	4
6.	21152C36	Electronic Devices and Circuits	3	0	0	3
		PRACTICALS				
7.	21152L37	C Programming and Data Structures Lab	0	0	4	2
8.	21152L38	Electronic Devices and Circuits Lab	0	0	4	2
9.	21152L39	Professional Development	0	0	2	1
		TOTAL	18	2	12	26

SEMESTER IV

Sl. No	COURSE CODE	COURSE TITLE	L	T	P	C
		THEORY				
1.	21152C41	Electromagnetic Fields	3	0	0	3
2.	21152C42	Linear Integrated Circuits	3	0	0	3
3.	21152C43	Communication Systems	3	0	0	3
4.	21152C44	Digital Signal Processing	3	0	2	4
5.	21152C45	Networks and Security	3	0	2	4
6.	21149S46	Environmental Sciences and Sustainability	3	0	0	3
		PRACTICALS				
7.	21152L47	Linear Integrated Circuits Laboratory	0	0	4	2
8.	21152L48	Communication Systems Laboratory	0	0	4	2
		TOTAL	18	0	12	24

SEMESTER V

Sl. No	COURSE CODE	COURSE TITLE	L	T	P	C
		THEORY				
1.	21152C51	Wireless Communication	3	0	2	4
2.	21152C52	VLSI and Chip Design	3	0	0	3
3.	21152C53	Transmission Lines and RF Systems	3	0	0	3

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4.	21152E54_	Elective - I	3	0	0	3
5.	21152E55_	Elective – II	3	0	0	3
6.	21152E56_	Elective - III	3	0	0	3
7.	21147MC51_	Mandatory Course - I	3	0	0	0
		PRACTICALS				
8.	21152L58	VLSI Laboratory	0	0	4	2
		TOTAL	21	0	6	21

SEMESTER VI

SL No	COURSE CODE	COURSE TITLE	L	T	P	C
THEORY						
1.	211 OE61_	Open Elective - I	3	0	0	3
2.	21152S62	Embedded Systems and IOT Design	3	0	2	4
3.	21152S63	Artificial Intelligence and Machine Learning	3	0	2	4
4.	21152E64_	Elective – IV	3	0	0	3
5.	21152E65_	Elective – V	3	0	0	3
6.	21152E66_	Elective – VI	3	0	0	3
7.	21147MC61_	Mandatory Course - II	3	0	0	0
		TOTAL	21	0	4	20

SEMESTER VII

Sl. No	COURSE CODE	COURSE TITLE	L	T	P	C
THEORY						
1.	211_S71	Human Values and Ethics	2	0	0	2
2.	21160S72_	Elective - VII	3	0	0	3
3.	211__OE73_	Open Elective – II	3	0	0	3
4.	211__OE74_	Open Elective – III	3	0	0	3
5.	211__OE75_	Open Elective – IV	3	0	0	3
PRACTICALS						
6.	21152INT76	Summer Internship	0	0	0	2
		TOTAL	14	0	0	16

SEMESTER VIII

Sl. No	COURSE CODE	COURSE TITLE	L	T	P	C
PRACTICALS						
1.	21152P81	Project Work	0	0	20	10
		TOTAL	0	0	20	10
		TOTAL NO. OF CREDITS:				164

LIST OF ELECTIVES

ELECTIVE - I (SEMESTER V)

SL No	COURSE CODE	COURSE TITLE	L	T	P	C

1.	21152E54A	Optical Communication Networks	3	0	0	3
2.	21152E54B	4G /5G Communication Networks	3	0	0	3
3.	21152E54C	Avionics Systems	3	0	0	3

ELECTIVE – II (SEMESTER V)

Sl. No	COURSE CODE	COURSE TITLE	L	T	P	C
1.	21152E55A	Satellite Communication	3	0	0	3
2.	21152E55B	Image Processing	3	0	0	3
3.	21152E55C	Speech Processing	3	0	0	3

ELECTIVE – III (SEMESTER V)

Sl. No	COURSE CODE	COURSE TITLE	L	T	P	C
1.	21152E56A	DSP Architecture and Programming	3	0	0	3
2.	21152E56B	Advanced Digital Signal Processing	3	0	0	3
3.	21152E56C	Computer Vision	3	0	0	3

ELECTIVE – IV (SEMESTER VI)

Sl. No	COURSE CODE	COURSE TITLE	L	T	P	C
1.	21152E64A	Software Defined Radio	3	0	0	3
2.	21152E64B	Software Defined Networks	3	0	0	3
3.	21152E64C	Massive MIMO Networks	3	0	0	3

ELECTIVE - V (SEMESTER VI)

Sl. No	COURSE CODE	COURSE TITLE	L	T	P	C
1.	21152E65A	Advanced Wireless Communication Techniques	3	0	0	3
2.	21152E65B	MEMS Design	3	0	0	3
3.	21152E65C	Fundamentals of Nanoelectronics	3	0	0	3

ELECTIVE - VI (SEMESTER VI)

Sl. No	COURSE CODE	COURSE TITLE	L	T	P	C
1.	21152E66A	Remote Sensing	3	0	0	3
2.	21152E66B	Wireless Sensor Network	3	0	0	3

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Principal
Pondicherry Institute of Science and Technology (PIST)
Deemed to be University
Vellore, Thanjavur - 613 403.

		Design				
3.	21152E66C	Wearable Devices	3	0	0	3

LIST OF OPEN ELECTIVES

OPEN ELECTIVE – I (SEMESTER VI)

Sl. No	DEPT	COURSE CODE	COURSE TITLE	L	T	P	C
1.	Civil	21155OE63	Climate Change and its Impact	3	0	0	3
2.	EEE	21153OE63	Renewable Energy System	3	0	0	3
3.	Mech	21154OE63	Introduction to Industrial Engineering	3	0	0	3
4.	CSE	21150OE63	Graph Theory	3	0	0	3
5.	ECE **	21152OE63	Deep Learning	3	0	0	3

** Applicable for other Departments

OPEN ELECTIVE – II (SEMESTER VII)

Sl. No	DEPT	COURSE CODE	COURSE TITLE	L	T	P	C
1.	Civil	21155OE73	ICT in Agriculture	3	0	0	3
2.	EEE	21153OE73	Introduction to Control Engineering	3	0	0	3
3.	Mech	21154OE73	Aviation Management	3	0	0	3
4.	CSE	21150OE73	Dev-Ops	3	0	0	3
5.	ECE **	21152OE73	Robotics Process Automation	3	0	0	3

** Applicable for other Departments

OPEN ELECTIVE – III (SEMESTER VII)

Sl. No	DEPT	COURSE CODE	COURSE TITLE	L	T	P	C
1.	Eng	21147OE74	English for Competitive Examinations	3	0	0	3
2.	Civil	21155OE74A	Remote Sensing Concepts	3	0	0	3
3.	Civil	21155OE74B	Drinking Water Supply and Treatment	3	0	0	3

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Dean
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4.	EEE	21153OE74A	Renewable Energy Technologies	3	0	0	3
5.	EEE	21153OE74B	Electric and Hybrid Vehicle	3	0	0	3
6.	Mech	21154OE74A	Industrial Management	3	0	0	3
7.	Mech	21154OE74B	Introduction to NonDestructive Testing	3	0	0	3
8.	ECE **	21152OE74A	Biomedical Instrumentation	3	0	0	3
9.	ECE **	21152OE74B	Fundamentals of Electronic Devices and Circuits	3	0	0	3

** Applicable for other Departments

OPEN ELECTIVE – IV (SEMESTER VII)

Sl. No	DEPT	COURSE CODE	COURSE TITLE	L	T	P	C
1.	Civil	21155OE75A	Geographical Information System	3	0	0	3
2.	Civil	21155OE75B	Basics of Integrated Water Resources Management	3	0	0	3
3.	EEE	21153OE75A	Sensors	3	0	0	3
4.	EEE	21153OE75B	Electrical, Electronic and Magnetic materials	3	0	0	3
5.	Mech	21154OE75A	Additive Manufacturing	3	0	0	3
6.	Mech	21154OE75B	Safety in Engineering Industries	3	0	0	3
7.	ECE **	21152OE75A	Wearable Devices	3	0	0	3
8.	ECE **	21152OE75B	Medical Informatics	3	0	0	3

** Applicable for other Departments

LIST OF MANDATORY COURSES

MANDATORY COURSE – I (SEMESTER V)

SL No	COURSE CODE	COURSE TITLE	L	T	P	C
1.	21147MC51A	Introduction to Women and Gender Studies	3	0	0	3
2.	21147MC51B	Elements of Literature	3	0	0	3
3.	21147MC51C	Film Appreciation	3	0	0	3

4.	21147MC51D	Disaster Management	3	0	0	3

MANDATORY COURSE – II (SEMESTER VI)

Sl No	COURSE CODE	COURSE TITLE	L	T	P	C
1.	21147MC61A	Well Being with Traditional Practices (Yoga, Ayurveda and Siddha)	3	0	0	3
2.	21147MC61B	History of Science and Technology in India	3	0	0	3
3.	21147MC61C	Political and Economic Thought for a Humane Society	3	0	0	3
4.	21147MC61D	State, Nation Building and Politics in India	3	0	0	3
5.	21147MC61E	Industrial Safety	3	0	0	3

B.TECH (FULL TIME) – ECE – R-2021

CREDITS DISTRIBUTION
CGPA CREDITS

Sem.	Core Courses				Elective Courses				Foundation Courses		Mandatory Courses		TOTAL CGPA Credits
	Theory Courses		Practical Courses		Dept. Elective		Open Elective						
	Nos.	Credit	Nos.	Credits	Nos.	Credits	Nos.	Credits	Nos.	Credits	Nos.	Credits	
I	01	3	03	5	-	-	-	-	04	13	-	-	21
II	02	7	03	6	-	-	-	-	04	14	-	-	27
III	05	17	03	5	-	-	-	-	01	4	-	-	26
IV	05	17	02	4	-	-	-	-	01	3	-	-	24
V	03	10	01	2	03	9	-	-	-	-	1	0	21
VI	02	8	-	-	03	9	01	3	-	-	1	0	20
VII	-	-	01	2	01	3	03	9	01	2	-	-	16
VIII	-	-	01	10	-	-	-	-	-	-	-	-	10
TOTAL CREDITS													165

NON CGPA CREDITS

Sem.	Non- CGPA Credits	
	No of Courses	Credits
I	01	00
II	-	-
III	-	-
IV	-	-
V	01	00
VI	01	00
VII	-	-
VIII	-	-
Total	03	00

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SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Detailed Syllabus for Machine learning techniques:

UnitName	Contents
Introductionof Python	• PythonInstallationwithvarious IDE's • Python dataTypes • Control Structure • Functions • Introductionof OOP's
Dataanalysisand Exploration	• DataAnalysis&visualization – using • numpy, • panda • matplotlib, • scipyetc
Machine learning &ItsApplication.	• Introductiontomachine learning. • Supervisedmachine learning • Unsupervisedmachinelearning • Studyofvariousmachinelearningalgorithms including Classification, Regression, • KNN, • K Means, • Logistic Regression, • SupportVectorMachines (SVM), • DecisionTree, • NaïveBayes, • EnsembleMethods,RandomForestetc
Mini Project/Prediction	• MiniProject/Prediction

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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 CPU 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

achieved is perhaps still open to deba:, 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 a d support from the Raspberry Pi foundation focused on their Raspian Linux distribution, which is a Debian deriva ive with support and optimisation for the Raspberry Pi hardware.

Module 4 – EMBEDDED SYSTE I DESIGN USING

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

Module 5 –applications of embedd l systems

Embedded systems are common found in consumer, industrial, automotive, home appliances, medical, telecommunication, commercial, aero pace and military applications. ...

Consumer electronics include M 3 players, television sets, mobile phones, video game consoles, digital cameras, GPS receivers, and printers.

Key concepts include:

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

ELIGIBILITY

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

COURSE DURATION: 45 Ho rs

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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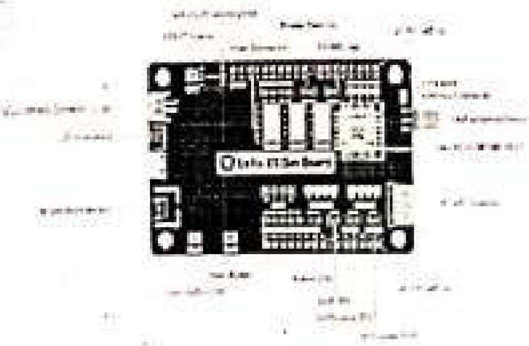
Hardware Specification



COURSE OBJECTIVES

- Introduction & Overview of IoT Traditional Communication Networks
- Existing IoT Protocols
- LoRa over IoT
- LoRa Network Design-Backend Design
- LoRa Gateway
- LoRa Point-to-Point Communication
- LoRa WAN

COURSE CONTENT –LORA AND LORAWAN COMMUNICATION USING IOT

IoT Training

Syllabus Module 1 –

IOT Introduction

- Concepts and Definitions of TheInternet 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 andnetworking 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 (Atleast 4 Projects)
- Data Generator

Module 3 – IOT Data Acquisition &Platforms

- Micro Controllers (Arduino uno/mega2560, Rasberry-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 IOTand uses
- Case Study over Mysql / NoSql / NewSql
- Case Study over Cloud ServicesAnd Administration
- Case Study Of Big Data & HadoopPlatforms

Module 6 – IOT Data Analytics &Visualization

- Analysis Of data using the IpythonModule
- Visualization and interpretation ofData
- Data Cleaning in IoT

Module 7 – IOT Security

- Attack, Defense, and NetworkRobustness of Internet of Things
- Malware Propagation and Controlin the Internet of Things
- Privacy Preservation DataDissemination
- Trust and Trust Models for the IoT
- Authentication in IoT
- Computational Security for the IoT
- Security Protocols for IoT AccessNetworks
- Security Testing

Module 8 – IOT Product Development &Testing with Project

CHOD (ECE)

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Dr. B.Chandrasekaran, M.Sc(Ag), Ph,D.,
F.(ISA), F.ISR(FOA, Rome), C.SRINM (IRRI), Prod. Advocate (APO, Japan)
Dean (Academic),
School of Agriculture

Date:12.05.2021

CIRCULAR

All the staff members are requested to attend the Board of Study Meeting scheduled on 17.05.2021(Monday) between 10.00 AM to 12.30 PM at Zoom meeting (online) under the chairmanship of Dr. B.Chandrasekaran. all are requested to attend without fail.

HEAD
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Sd/-
Dean (Academic)
School of Agriculture

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SCHOOL OF AGRICULUTRE

BOARD OF STUDIES MEETING 2021-2022

Date: 17.05.2021

Mode: Online

AGENDA

S. No	Subject
Welcome Address	
1.	Welcome Address by the council chairman
Items for reporting to the Board of Studies Meeting	
2.	1. To consider the inclusion of add on and audit course in existing curriculum 2. To confirm the minutes of the pre board of studies meeting held on 05.05.2021.

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SCHOOL OF AGRICULTURE

MINUTES OF MEETING

The meeting board of studies in School of Agriculture was held on 17th May 2021Monday 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
   Associatet Professor, Member
7. Dr.V.A.Thiruppathi
   Assistant professor , member
8. Mrs. S.R.Rajam
   Assistant Professor, Member
9. Dr. A. Velayutham, Ph.D.,
   Dean, Agricultural college and Research Institute,Eachangkottai, Thanjavur.
   Academic Expert – External Member
10. Mr. K. K. Magudapathi, M. Sc., (Agri)
    Dunhills Phyto Herbs,211, Velayuthasamy Complex,Muthur Road, Vellakoil,
    Tiruppur (Dt).**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 Department of Academic council has suggested to add on course in the syllabus for the Entrepreneurship Skills and Development.
2. The Dean Dr. A. Velayutham suggested to change some elective course based on the recent innovative technology.
3. The board of study meeting discuss about DAC meeting and confirmation the minutes of DAC meeting
4. The Board of Studies after a discussion the Change the elective course adds in the syllabus for 2021 batch of the students.
5. The board of study meeting discuss about value added course. In the BOS meeting decide to add new value added course

THE LIST OF NEW VALUE ADDED COURSE:

- Certificate course on Kitchen Garden
- Certificate course on Landscape
- Certificate course on Non-Chemical Farming
- Certificate course on Post Harvest Technology
- Certificate course on Seed Technology

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LIST OF NEW COURSE (2021-2022)

S.NO	PROGRAMME NAME	COURSE CODE	COURSE
1	B.Sc. (Hons) Agriculture	18 OPT 201-I	crop ecology
2	B.Sc. (Hons) Agriculture	18 OPT 201-IV	Sustainable agriculture
3	B.Sc. (Hons) Agriculture	18 OPT 301-III	Bio compost
4	B.Sc. (Hons) Agriculture	18 OPT 302-III	Industrial agro forestry

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Semester – wise distribution of courses

I Semester

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

II Semester

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

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III Semester

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

IV Semester

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

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III Semester

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

IV Semester

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

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V Semester

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

VI Semester

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

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VII Semester

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

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

RAWE Component-I

Village Attachment Training Programme

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

RAWE Component-II

Agro Industrial Attachment

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

Activities and Tasks during Agro-Industrial Attachment Programme

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

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

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

S. No.	Title of the module	Credits
1	Production Technology for Bioagents and Biofertilizer	0+10
2	Seed Production and Technology	0+10
3	Mushroom Cultivatiuon Technology	0+10
4	Soil, Plant, Water and Seed Testing	0+10
5	Commercial Beekeeping	0+10
6	Poultry Production Technology	0+10
7	Commercial Horticulture	0+10
8	Floriculture and Landscaping	0+10
9	Food Processing	0+10
10	Agriculture Waste Management	0+10
11	Organic Production Technology	0+10
12	Commercial Sericulture	0+10

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

S. No.	Course code	Courses	Credit Hours
1.	18 OPT 201-I	crop ecology	
2.	18 OPT 201-II	Landscaping	3(2+1)
3.	18 OPT 201-III	Agribusiness Management	3(2+1)
4.	18 OPT 201-IV	Sustainable agriculture	3(1+2)
5.	18 OPT 301-I	Food Safety Issues	3(2+1)
6.	18 OPT 301-II	Biopesticides & Biofertilizers	3(2+1)
7.	18 OPT 301-III	Bio compost	3(2+1)
8.	18 OPT 301-IV	Micro propagation Technologies	3(2+1)
9.	18 OPT 302-I	Hi-tech. Horticulture	3(1+2)
10.	18 OPT 302-II	Weed Management	3(2+1)
11.	18 OPT 302-III	Industrial agro forestry	3(2+1)
12.	18 OPT 302-Iv	Agricultural Journalism	3(2+1)

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CROP ECOLOGY

Principles of crop ecology; Ecosystem-concept and determinants of crop productivity; Physiological limits of crop yield and variability in relation to ecological optima; Crop adaptation; Climate shift and its ecological implication; Greenhouse effect; Agro-ecological and agro climatic regions of India: Geographical distribution of cereals, legumes, oilseeds, vegetables, fodders and forages, commercial crops, condiments and spices, medicinal and aromatic plants; Adverse climatic factors and crop productivity; Photosynthesis, respiration, net assimilation, solar energy conversion efficiency and relative water content, light intensity, water and CO2 in relation to photosynthetic rates and efficiency; Physiological stress in crops, detection and indices; Remote Crop Ecology and Geography sensing: Spectral indices and their application in agriculture

SUSTAINABLE AGRICULTURE

Crop-Livestock Integration: This system involves the integration of crop and livestock production in a single farming system. Livestock can provide manure for crop production, while crop residues can be used as animal feed. This system can increase overall productivity, improve soil fertility, and reduce pest and disease pressure.

Agroforestry: Agroforestry involves the integration of trees with crops and livestock in a farming system. Trees can provide multiple benefits such as shade, windbreaks, soil conservation, and timber production, as well as providing habitats for wildlife. Agroforestry can increase overall productivity, improve soil health, and enhance biodiversity.

Conservation Agriculture: Conservation agriculture is a farming system that aims to reduce soil erosion, improve soil health, and conserve natural resources such as water and nutrients. This system involves minimal soil disturbance, the use of cover crops and crop residues to protect the soil, and crop rotation to improve soil fertility and reduce pest and disease pressure.

Sustainable Intensification: Sustainable intensification is a farming system that aims to increase productivity while minimizing negative environmental impacts. This system involves the use of

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technology and management practices to optimize the use of resources such as water and fertilizer, and the adoption of practices that enhance soil health and biodiversity.

BIO COMPOST

Contents

1. Introduction to Biocomposting
2. Ecological Importance of Biocomposting
3. Biocomposting - Types of Technology
4. Pit Composting
5. Heap Composting
6. Tank Composting
7. Large Scale Composting
8. Batch Composting
9. Continuous Composting
10. Biocompost in Soil Fertility Maintenance
11. Biocompost in Promotion of Plant Growth
12. Application of Biocompost in Value Added Products
13. Biocompost in Waste Reduction
14. Economics of Establishment of Small Biocompost Unit
15. Project Report Proposal for Self help Group

INDUSTRIAL AGRO FORESTRY

UNIT I: Importance of Agriculture/Forestry/Livestock in National Economy

Principles of crop ecology and crop adaptation

Climate shift and its ecological implications-Agro-ecological regions in India

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Geographical distribution of crop plants-Greenhouse effect-Climatic factors and their effect on plant processes and crop productivity-Role of GIS and GPS in agriculture-Major pests and diseases of following crops with their management-Rice, Wheat,Cotton,Chickpea,Sugarcane-Important rural development programmed in India-Organisational set up of agricultural research-Education and extension in India-Elements of statistics

UNIT II: Agricultural Soil Fertility and Fertiliser Use-Essential plant nutrients and their deficiency symptoms-Concept of essentiality of plant nutrients

Indicators of soil fertility and productivity

UNIT III: Sustainable Land Use Systems-Sustainable agriculture: parameters and indicators

Conservation agriculture-Safe disposal of Agri-industrial waste for crop production, Argo-forestry

UNIT IV: Layout and Establishment of Orchards

Pruning and training; propagation, climatic requirement and cultivation of fruits like Mango, Banana, Citrus, Guava, Grape, Pineapple, Papaya, Apple, Pear, Peach, Plum

Cultivation of plantation crops and spices like Coconut, Cashew nut, Black pepper, Coriander, Turmeric

Important physiological disorders

Unit V: ForestImportance, types, classification, ecosystemBiotic and abiotic components-Ecological succession-Nursery and planting technique-Social forestry-Farm forestry-Urban forestry-Community forestry-Forest management

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AGRI TOURISM

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

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

Unit III: Characteristics of quality and their grant.

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

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

KITCHEN GARDEN

Unit I: characteristics of kitchen garden - Vegetableoccupyanimportantplaceinourdailylifeparticularlyforvegetarians.Vegetables are the only source to increase not only the nutritive values of foods but also itspalatability

Unit II: Kitchen Garden Site Selection- There will belimited choicefor the selection of sitesforkitchen gardens.Thefinalchoice is usually the backyard of the house.

UnitIII : Landpreparation- Firstly a through spade digging is made to a depth of 30-40 cm. stones, bushes andperennial weeds are removed.

UnitVI : Sowingandplanting - Seeds of transplanted crops like tomato, Brinjal and Chilli can be sown in nursery beds orpots one month in advance by drawing lines.

UnitV : Harvesting

LANDSCAPING

Unit 1: Early history, principles of landscape formal informal gardening, designing landscapes, basic style,

Unit 11: Tree style- mogul garden, garden in hills, plains, botanical garden, garden, park, small home, school and industrial gardens, road side gardens highways, dams, roof garden, balcony garden, terrariums, japanese garden

Unit III: conceptual basis, types and styles, plant and other materials

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Unit IV: Conceptual basis, types and styles, plant and other materials, decoration, materials and methods of drying.

Unit V: Management of light, humidity, watering, maintenance of pot plants and indoor plants.

NON CHEMICAL FARMING

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

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

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

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

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

POST HARVEST TECHNOLOGY

Unit 1: Post harvest technology of vegetable crops

Unit II: Post harvest technology of fruit crops

Unit III: Value addition flowers

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

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SEED TECHNOLOGY

Unit 1: Seed: importance and biology

Unit II: seed production

Unit III: Post harvest handling of seeds

Unit IV: Seed storage and marketing

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SCHOOL OF COMMERCE AND MANAGEMENT

DEPARTMENT OF BUSINESS MANAGEMENT

Minutes of Board of Studies Meeting

The Board of Studies meeting for the department of Business Management is held on 18.05.2021 at 10.00 a.m. PRIST Deemed to be University, Thanjavur under the chairmanship of Dr. K. G. Selvan.

The following members were present:

Dr K G Selvan (Chairperson/ HoD)
Dr. N. S. Shibu (External Expert-Academic)
Mr. S. Ravi (External Expert- Industry)
Dr T J Jayasholan / Prof & Member of BOS
Dr. S. Venkatesh / Prof & Member of BOS
Dr. P Balasubramanian / Prof & Member of BOS
Dr. K Rajalakshmi / Prof & Member of BOS
K.Sasikumar / Prof & Member of BOS
P Uma Eswari / Prof & Member of BOS
Dr.U.Rajan (Invited Dean)
M. Abi Aravind (Alumini)
S. Sriraman (Current student)

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

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

Signature of the Chairman & Members

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Department of Business Management
Pattaiyah Ramasamy Institute of
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Name of th Programme	Name of the Course	Course code	Year of Introduction
BBA	Talent and Knowledge Management	20160DSC54B	2021
BBA	Information Technology for Business	20160DSC54C	2021
BBA	Goods and service Tax	20160DSC54D	2021
BBA	Leadership and Change Management	20160DSC54E	2021
BBA	Management science	20160DSC54F	2021

The Board of Studies Discussion on Introduced Value Added Certificate Course. (2021-2022)

S.NO	COURSE TITLE	COURSE CODE
1	Diploma Course Tourism Management	2021CTM
2	Certificate course Personality Development	2121CPD
3	Management of Organization and People	2121MOP
4	Certificate course Entrepreneurship and Innovation	18002CEIC
5	Certificate course Business Writing	19002CCBW

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Members Signature

Dr K G Selvan (Chairperson/ HoD)
Dr. N. S. Shibu (External Expert-Academic)
Mr. S. Ravi (External Expert- Industry)
Dr T J Jayasholan / Prof & Member of BOS
Dr. S. Venkatesh / Prof & Member of BOS
Dr. P Balasubramanian / Prof & Member of BOS
Dr. K Rajalakshmi / Prof & Member of BOS
K.Sasikumar / Prof & Member of BOS
P Uma Eswari / Prof & Member of BOS
Dr.U.Rajan (Invited Dean)
M. Abi Aravind (Alumini)
S. Sriraman (Current student)

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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
19160DSC54B	Talent and Knowledge Management	0	0	2	1
19111SEC01L	Communicative English Lab- I	0	0	1	1
19IETHVALS	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
19160DSC54C	Information Technology for Business	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
19160DSC54D	Goods and service Tax	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
19160DSC54E	Leadership and Change Management	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
19160DSC54F	Management science	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
191EXACT	Extension Activity	0	0	0	0
19160PEE	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

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BBA - 2020 REGULATION
PRIST UNIVERSITY, THANJAVUR

Course Code	Course Title	L	T	P	C
20160DSC54B	TALENT AND KNOWLEDGE MANAGEMENT	6	0	0	4

OBJECTIVE

Knowledge management focuses on the spread of information, while the central focus of talent management is people.

COURSE OUTCOMES

- Talent Management Process
- Succession and career planning approaches
- Knowledge management aspects
- Knowledge management assessment and solutions

Unit-I

Introduction to Talent Management: Meaning and Importance of Talent Management, Designing and Building a Talent Reservoir, Segmenting the Talent Reservoir, Talent Management Grid; Creating a Talent Management System; Institutional Strategies for Dealing with Talent Management.

Unit-II

Talent Management System: Competency Meaning, Characteristics, Types Steps in Developing a Valid Competency Model, Talent Management Information Systems, Developing a Talent Management Information Strategy, Role of Leaders in Talent Management.

Unit-III

Introduction to Knowledge Management: The Nature of Knowledge Management, Alternative Views of Knowledge, Types of Knowledge, Location of Knowledge, Rise of the Knowledge Worker, Features of Knowledge Intensive Firm, Key Processes in Knowledge Intensive Firms.

Unit-IV

Knowledge Management Framework: Knowledge Management Framework of Hansen, Earl's Seven Schools of Knowledge Management, Alvesson and Karreman's Knowledge Management Approaches, Knowledge Management Solutions, Mechanisms and Systems, Knowledge Management Infrastructure.

Unit-V

Impact and Assessment of Knowledge Management: Organizational Impacts of Knowledge Management-on People, Processes, Products and Organizational Performance, Factors Influencing Knowledge Management, Knowledge Management Assessment of an Organization- Importance, Types and Timing, Knowledge Discovery Systems.

Suggested Books:

1. Lance A. Berger and Dorothy R Berger. "The Talent Management Handbook", 2004, Tata McGraw Hill. 2. Ed by Larry Israelite, "Talent Management", ASTD Press. 3. Sajjad M Jasmuddin, "Knowledge Management", 1st Ed, 2009. Cambridge. 4. Awad, Elias M. Awad, Knowledge Management, Pearson Education India. 5. Carl, F. Rappadio, Knowledge Management, John Wiley & Son.

Suggested Readings:

- Lance A Berger, Dorothy R Berger, The Talent Management Handbook, 2e, TMH, 2008
- Irma Becerra-Fernandez, Avelino Gonzalez, Rajiv Sabherwal, Knowledge Management: Challenges, Solutions, and Technologies, Pearson, 2009
- Sudhir Warier, Knowledge Management, Vikas, 2004.

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Department of Business Management
Pondicherry Institute of
Science & Technology (PIST)
THANJAVUR-613 403.

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Course Code	Course Title	L	T	P	C
20160DSC54C	INFORMATION TECHNOLOGY FOR BUSINESS	5	0	0	4

OBJECTIVE

To understand the significance of information technology, conceptual framework of networking, communication technology, database etc. for individual & business management To understand role.

UNIT-I

Computer Concepts and Applications: Introduction to Information Technology, Scope of IT in business -Categories of Machines- Servers- How Computers work- Hard ware-Input Hardware Processing and Memory- Hardware: Storage Hardware, Output hardware, Software-System software, Application Software, History Input-Output devices.

UNIT-II

Introduction to Software: Introduction to Software: System Software, Components of System software-The operating system: What it does-Booting-User interface- CPU Management-File Management- Task Management: Multitasking, Multiprogramming, Timesharing, Multiprocessing, Formatting – System software.

UNIT-III

Application of IT in functional Areas: IT and Marketing, IT and Finance, IT and Operational Management, IT and Human Resource Management – Enterprise Systems- Knowledge Management.

UNIT-IV

Data Communication, Networks, and Internet Concepts: Data Communication, Networks and Internet Concepts: Benefits of Networks, Types of Networks, Types of LAN, Components of LAN, Topology of LAN, Analog and Digital signal- Internet Concepts: The internet and World Wide Web, Sending and Receiving E-mail, Search Engines, Other Internet Resources-FTP, Telnet, E-Commerce. Network and internet security issues, Extranet and Intranet.

UNIT-V

Programming Concepts and Tools: Introduction to Programming, Concepts, and Tools, Five-step programming, Design the program, code the program, test the program, Document and maintain the program, Five generations of programming languages, programming languages used today, Pseudo Code.

References:

1. Stuart Barnes, "Knowledge Management Systems", Ed, Cengage Learning.

2. Irma Becerra-Fernandez, Avelino Gonzalez and Rajiv Sabherwal "Knowledge Management", 2009, Pearson Education Inc.

3. Donald Hislop, "Knowledge management in Organizations", 2009, Oxford University Press, Second edition.

Course Code	Course Title	L	T	P	C
20160DSC54D	GOODS AND SERVICE TAX	6	0	0	4

OBJECTIVE

To impart knowledge of principles and provisions of GST and Customs Law, the important legislation dealing with indirect tax system in India; and to enable the students to apply the same practically.

Unit I

Introduction to Indirect Tax Structure, Meaning and Objectives of GST, Salient features of GST, Comprehensive Structure of GST in India, Single and Dual GST, Advantages and Challenges of GST Implementation

Unit II

Background, History, Introduction Constitutional framework of Indirect Taxes before GST (Taxation Powers of Union & State Government)Defects in the structure of Indirect Taxes prior to GST; Rationale for GST;

Unit III

Tax compliance, GST administrative structure, Impact of GST on Economy, Understanding SGST, CGST, IGST, UTGST

Unit IV

Classification under GST, Rates and Schedules, GST Council, GST Network, State Compensation Mechanism, Definitions under GST.

Unit V

Place of Supply: Within state, Interstate, Import and Export, Time of supply; Valuation for GST- Valuation rules, taxability of reimbursement of expenses; Exemption from GST: Small supplies and Composition Scheme;

Reference Books

Ahuja, Girish, Gupta Ravi, GST & Customs Law.
Babbar, Sonal, Kaur, Rasleen and Khurana, Kritika. Goods and Service Tax (GST) and Customs Law. Scholar Tech Press.

- Bansal, K. M., GST & Customs Law, Taxmann Publication.
- Gupta, S.S., GST- How to meet your obligations (April 2017), Taxmann Publications. Gupta, S.S., Vastu and Sevakar, Taxmann Publications, 2017.

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Course Code	Course Title	L	T	P	C
20160DSC54E	LEADERSHIP AND CHANGE MANAGEMENT	6	0	0	4

Course Objectives:

- To know the concept of leadership and management;
- compare and contrast the major theories of leadership;
- analyse the decision-making process and change management;
- Evaluate the qualities necessary to effectively manage or lead in a team/groupenvironment.

Leadership and Management	
Unit-1	**Introduction to Leadership** (Roles, functions and characteristics of a leader; evolution and growth of leadership; Leadership traits and ethics; Attitude, Behaviour, Personality traits and leadership; Types and Styles of leadership)
Unit-2	**Leadership and Management** (Nature, Scope and Significance of Management; Levels of Management; Functions: Planning, Organizing, Staffing, Directing and Controlling; Skills: Conceptual, Human and Technical; Roles: Interpersonal, Informational and Decisional; difference between a leader and a manager)
Unit-3	**Theories of Leadership** (Trait Theory, Behavioral theories, Contingency Theories, Transactional Theories andTransformational Leadership Theory)
Unit-4	**Issues and Challenges for Leader** (Immerging trends in leadership; Servant leadership, Situational leadership; Gender and leadership; Effective Leadership Communication; Emotional intelligence and leadership)
Unit-5	**Self-Discovery – Developing Self** (Awareness of personal values, beliefs and Vision, Mission and Goals that motivates behaviour; Personal SWOT; Trust: Openness, confidentiality, blind spot and unknown part of personality; Self-disclosure, seeking feedback, self-reflection, introspection and self-management)

Books Recommended:

1. Sham Lal. Indian Realities in Bits and Pieces, Rupa and Co. New Delhi
2. Surendra Kumar & Pradeep Kapur. India of My Dreams, Academic Foundation, New Delhi
3. Nissam, Urlah. India: Economic, Political and Social Issues
4. Drucker, Peter and Maciariello, Joseph: 366 Days of Insight and

Motivation for Getting The Right Things Done: Rutledge

Course Code	Course Title	L	T	P	C
20160DSC54F	MANAGEMENT SCIENCE	6	0	0	4

COURSE OBJECTIVES

To impart knowledge of source and function of values. Demonstrate an understanding of the importance of values, ethics, and social responsibility for the self and for contemporary society.

COURSE OUTCOMES

1. Exercise critical thinking to propose, communicate, and implement, action plan that addressopportunities and issues.
2. Identify and utilize ethical and legal standards in psychology while taking into account allrelevant stakeholders.
3. Observe and recognize behaviours in organizational settings to aid in predicting outcomes.
4. Appreciate the importance of time management, planning, and communication in completinga group project.
5. Integrate knowledge of the key theories across the disciplines of public administration.

UNIT - I

CONCEPTS OF MANAGEMENT AND ORGANISATION: Functions of management, evolution of management thought, Taylor's scientific management, fayol's principles of management, Hertzberg's Maslow's hierarchy of human needs, theory x and y, Hawthorne experiment, morale, motivation, working environmental conditions, systems approach to management.

UNIT - II

PLANT LOCATION: Definition, factors affecting the plant location, comparison of rural and urban sites, methods for selection of plant- matrix approach. Plant layout - definition, objectives, types of plant layout, various data analyzing forms travel chart.

UNIT - III

INTRODUCTION TO PERT / CPM : Project management, network modelling-probabilistic model, various types of activity times estimation, programme

evaluation review techniques, critical path, probability of completing the project, deterministic model, critical path method (CPM), critical path calculation, crashing of simple of networks.

UNIT - IV

MATERIALS MANAGEMENT: Objectives, inventory functions, types, associated costs, inventory classification techniques-ABC and VED analysis. Inventory control systems, continuous review system, periodical review system. Stores management and stores records. Purchase management, duties of purchase of manager, associated forms.

UNIT - V

INTRODUCTION TO HUMAN RESOURCE MANAGEMENT: Functions of HRM, job evaluation, different types of evaluation methods. Job description, merit rating, different methods of merit ratings, wage incentives, different types of wage incentive schemes. Marketing, selling, marketing mix, product life cycle.

REFERENCE BOOKS:

1. Stoner, Freeman (2005), Gilbert, Management, 6th edition, Pearson Education, New Delhi.
2. Panner Selvam (2004), Production and Operations Management, Prentice Hall of India, New Delhi.
3. Ralph M. Barnes (2004), Motion and Time Studies, John Wiley and Sons.

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2021– 2022

VALUE ADDED DIPLOMA AND CERTIFICATE COURSE SYLLABUS

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CERTIFICATE COURSES

PERSONALITY DEVELOPMENT

COURSE OBJECTIVES:

The course intents to develop talent, facilitate employability enabling the incumbent to excel and sustain in a highly competitive world of business. The programme aims to bring about personality development with regard to the different behavioural dimensions that have far reaching significance in the direction of organisational effectiveness. To make students know about self – awareness, life skills, soft skill, need for personal developmens etc.

COURSE OUTCOMES:

The students will be able to understand, analyse, develop and exhibit accurate sense of self. Think critically, demonstrate knowledge of personal beliefs and values and a commitment to continuing personal reflection and reassessment. Learn to balance confidence with humility and overcome problems associated with personality.

UNIT I

Introduction to Personality Development

The concept of personality - Dimensions of personality – Theories of Freud & Erickson-Significance of personality development. The concept of success and failure. What is success? - Hurdles in achieving success - Overcoming hurdles - Factors responsible for success - What is failure - Causes of failure. SWOT analysis.

UNIT II

Attitude & Motivation

Attitude - Concept - Significance - Factors affecting attitudes - Positive attitude - Advantages - Negative attitude- Disadvantages - Ways to develop positive attitude - Differences between personalities having positive and negative attitude. Concept of motivation - Significance - Internal and external motives - Importance of self- motivation- Factors leading to de-motivation

UNIT III

Self-esteem

Term self-esteem - Symptoms - Advantages - Do's and Don'ts to develop positive self-esteem - Low self esteem- Symptoms - Personality having low self esteem - Positive and negative self esteem. Interpersonal Relationships – Defining the difference between aggressive, submissive and assertive behaviours - Lateral Thinking.

UNIT IV

Other Aspects of Personality Development

Body language - Problem-solving - Conflict and Stress Management - Decision-making skills -

Leadership and qualities of a successful leader - Character building -Team-work - Time management -

Work ethics - Good manners and etiquette

UNIT V

Employability Quotient

Resume building- The art of participating in Group Discussion - Facing the Personal (HR & Technical)

Interview -Frequently Asked Questions - Psychometric Analysis - Mock Interview Sessions.

Text Books:

1. Hurlock, E.B (2006). Personality Development, 28th Reprint. New Delhi: Tata McGraw Hill.

2. Stephen P. Robbins and Timothy A. Judge(2014), *Organizational Behavior 16th Edition*: Prentice Hall.

Reference Books:

1. Andrews, Sudhir. *How to Succeed at Interviews*. 21st (rep.) New Delhi.Tata McGraw-Hill 1988.

2. Heller, Robert.Effective leadership. Essential Manager series. Dk Publishing, 2002

3. Hindle, Tim. Reducing Stress. Essential Manager series. Dk Publishing, 2003

4. Lucas, Stephen. Art of Public Speaking. New Delhi. Tata - Mc-Graw Hill. 2001

5. Mile, D.J Power of positive thinking. Delhi. Rohan Book Company, (2004).

6. Pravesh Kumar. All about Self- Motivation. New Delhi. Goodwill Publishing House. 2005.

7. Smith, B . Body Language. Delhi: Rohan Book Company. 2004

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Department of Business Management
Ponnaiyah Ram[illegible] of
Science & Technology (P[illegible])
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PRIST UNIVERSITY

Academic year: 2021-2022
Course: certificate course in wealth management
Subject Code: 2260WM

AIM: To emphasis Better performance in wealth management

OBJECTIVES:

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

OUTCOMES:

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

Wealth Management

Unit I:

Introduction to Wealth Management

Meaning of Wealth Management, Roles, Process and Needs of Wealth Management, Wealth Changes Meaning, Duties of Wealth Manager

Unit II:
Insurance Planning

Meaning, Basic Principles of Insurance – Definition and Characteristics, Different Types of Insurance Policies

Unit III:
Investment Planning

Investment - Meaning, Types of Investment, Risks related to investments, Features and importance of Investment, Investment alternatives.

Unit IV:
Retirement Planning

Understanding of Different Salary Components, Introduction to Retirement Planning, Purposeful Need of Retirement Planning, Retirement Benefit plans.

UnitV:
Tax Savings Schemes

Tax saving schemes – Meaning and concepts, Importance and benefits of tax saving, Various Income Tax Saving Schemes

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PRIST UNIVERSITY

Academic year: 2021-2022

Course- Certificate Course in Business Journalism

Subject Code: 2260BJ

AIMS: To emphasis better performance in Business Journalism

COURSE OBJECTIVES

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

OUTCOMES:

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

UNIT I

Basics of business and economic reporting

a. Different types of stories: Analytical, news, in-depth, interviews and data (with examples)
b. Where and how to get stories (press conferences, meetings, analyst con calls)
c. Building and maintaining sources
d. Connecting with the PR agencies and Corp Communications team

UNIT II

Numbers are your best friend - studying companies' financial statements

a. Understand the basic components of financial statements - Balance sheet (Assets & liabilities), Profit & loss statement (Income & expenditure), Cash flows, Notes to accounts;
b. Difference between consolidated / standalone financial statements;
c. Reporting of financial statements under various standards (India - Indian GAAP, International - US GAAP / IFRS);
d. Key financial metrics typically used from a business journalism perspective with live exam

UNIT III

Covering specific sectors -- automobile, technology and telecommunication, finance and insurance, education, health, transportation and logistics, infrastructure and power

a. Key industries that are considered as growth drivers of Indian economy;
b. Industry analyst. Reading of various reports published by industry analyst through primary research. Insights into growth drivers for each industry;
c. Understanding the dynamics of macro-economic factors that can influence each sector (with a cursory review; to be taken up in detail during the session on covering the broad economy;

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Academic year: 2021-2022

COURSE: DIPLOMA IN MANAGEMENT OF ORGANIZATION AND PEOPLE

Subject Code: 20diMOP

Objective :

- The course is intended to make the participating officers aware of the fundamentals of management and their significance in managing the organization.
- It also aims to make the officers know what affects human (employee) behaviour at work so that they can make their subordinates work more and better.

OUTCOMES:

Unit - I

Management:

Unit - II

O.B. :Introduction:

Unit - III

Individual Perspectives:

Unit - IV :

Group Dynamics:

Unit - V

Organizational Perspective:

Recommended Books

1.

2.

3.

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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 04.06.2021 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, Professor (Chairperson, BOS)
2. Dr. I. Chinnappa / Dean (Special Invitee)
3. Dr. P. Manonmani, Professor (Member, BOS)
4. Dr. Arjun Pandian, Associate Professor, (Member, BOS)
5. Dr. C. Anushia, Associate Professor (Member, BOS)
6. Dr. A. Shajahan, Assistant Professor (Member, BOS)
7. Dr. G. Venkatkumar, Assistant Professor (Member, BOS)
8. Dr. R. V. Shalini, Assistant Professor (Member, BOS)
9. Dr. 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. Mr. S. Janarthanan, M. Sc., Special Invitee Alumna, QC, Nila Sea food, Tuticorin
12. Mr. R. Praveenkumar, B. Sc Biotechnology, PRIST Deemed to be University, Thanjavur

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

The chairman briefed about the programmes and the curriculum. The committee carefully reviewed the curriculum and suggested no changes.

The committee prepared the list of examiners and submitted the above for the academic council.

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

Dean of Arts & Science
PRIST Deemed to be University
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Department of Biotechnology

Composition of Board of Studies 2021-2022

S.No.	Designation	Name	Qualification	Designation & Affiliation	Mail id
1	Chairperson/HoD	Dr. A. Bakrudeen Ali Ahemed	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. Manonmani	M.Sc., Ph.D	Professor, Department of Biotechnology, PRIST Deemed to be University, Vallam, Thanjavur.	manonmani@prist.ac.in
5	Associate Professor	Dr. C. Anushia	M.Sc., Ph.D	Associate Professor, Department of Biotechnology, PRIST Deemed to be University, Vallam, Thanjavur.	anushia@prist.ac.in
6	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. Venkatkumar	M.Sc., Ph.D	Assistant Professor, PRIST Deemed to be University, Vallam, Thanjavur.	venkatkumar@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 Invitee-Dean	Dr. L. Chinnappa	M.Sc., M. Phil., Ph.D	Dean, School of Arts and Science, PRIST Deemed to be University, Vallam, Thanjavur.	deanarts@prist.ac.in
11	Special Invitee-Alumnus/Alumna	Mr. S. Janarthanan	M.Sc.,	QC, Nila seafood, Tuticorin, Tamil Nadu	sjanarthanan@gmail.com
12	Special Invitee -Current student - UG or PG	Mr. R.Praveenkumar	B.Sc	Student	praveenkumar@prist.ac.in

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Signature of the Chairman & Members

1. Dr. Bakrudeen Ali Ahamed
2. Dr. L. Chinnappa/ Dean
3. Dr. P. Manonmani
4. Dr. Arjun Pandian
5. Dr. C. Anushia
6. Dr. A. Shajahan
7. Dr. G. Venkatkumar
8. Dr. R. V. Shalini
9. Mr. S. Janarthanan
10. Mr. R. Praveenkumar
11. Dr. P. Anantharaman
12. Mr. Umar Ali Khan

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Annexure I - Revised Curriculum structure Credits

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SCHOOL OF ARTS AND SCIENCE
DEPARTMENT OF BIOTECHNOLOGY
B. Sc., BIOTECHNOLOGY -REGULATION 2020
COURSE STRUCTURE

SEMESTER I

Course Code	Course Title	L	T	P	C
	THEORY				
20110AEC11/ 20111AEC11/ 20132AEC11/ 20135AEC11	Language-I (Tamil-I/ Advanced English-I/ Hindi-I/ French-I)	4	0	0	2
20111AEC12	English-I	4	0	0	2
20117AEC13	Fundamentals of Biological System	6	1	0	5
20115AEC14A	Biological Chemistry	6	1	0	4
	PRACTICAL				
20117AEC15L	Fundamentals of Biological System Lab	0	0	3	2
20115AEC16AL	Biological Chemistry Lab	0	0	3	2
	Total	20	2	6	17
	AUDIT COURSE				
201ACLSICN	Indian Constitution	0	0	0	2
201ACLSUHV	Universal Human Values	0	0	0	2

SEMESTER – II

Course Code	Course Title	L	T	P	C
	THEORY				
20110AEC21/ 20111AEC21/ 20132AEC21/ 20135AEC21	Language-II (Tamil-II/ Advanced English-II / Hindi-II/ French-II)	4	0	0	2
20111AEC22	English-II	4	0	0	2
20117AEC23	Cell Biology and Genetics	6	1	0	5
20116AEC24	Microbiology	6	1	0	4
	PRACTICAL				
20117AEC25L	Cell Biology and Genetics Lab	0	0	3	2
20116AEC26L	Microbiology Lab	0	0	3	2
	RESEARCH SKILL BASED COURSE				
20117RLC27	Research LED Seminar	-	-	-	1
	Total	**20**	**2**	**6**	**18**
201ACLSCOS	Communication Skills	-	-	-	2

201ACSSBBE	Basic Behavioral Etiquette	-	-	-	2

SEMESTER – III

Course Code	Course Title	L	T	P	C
	THEORY				
20110AEC31/ 20111AEC31/ 20132AEC31/ 20135AEC31	Language-III (Tamil-III/ Advanced English-III / Hindi-III/ French-III)	4	0	0	2
20111AEC32	English-III	4	0	0	2
20117AEC33	Plant Physiology	4	1	0	4
20117AEC34	Immunology	4	1	0	5
	PRACTICAL				
20117AEC35L	Plant Physiology Lab	0	0	3	2
20117AEC36L	Immunology Lab	0	0	3	2
	RESEARCH SKILL BASED COURSE				
20117RMC37	Research Methodology	2	0	0	2
	Total	**18**	**2**	**6**	**19**
	AUDIT COURSE				
201ACLSOAN	Office Automation	-	-	-	2

SEMESTER – IV

Course Code	Course Title	L	T	P	C
	THEORY				
20110AEC41/ 20111AEC41/ 20132AEC41/ 20135AEC41	Language-IV (Tamil-IV/ Advanced English-IV/ Hindi-IV/ French-IV)	4	0	0	2
20111AEC42	English-IV	4	0	0	2
20117AEC43	Animal Physiology	4	1	0	4
20117AEC44	Molecular Biology	5	1	0	5
201ENSTU45	Environmental studies	2	0	0	2
	PRACTICAL				
20117AEC46L	Animal Physiology Lab	0	0	3	2
20117AEC47L	Molecular Biology Lab	0	0	3	2
	Total	**19**	**2**	**6**	**17**
	AUDIT COURSE				
201ACLSLMS	Leadership and Management Skills	-	-	-	**2**
201ACSSAQA	General Aptitude and Quantitative Ability	-	-	-	**2**

SEMESTER – V

Course Code	Course Title	L	T	P	C
	THEORY				
20117AEC51	Food and Agricultural Biotechnology	4	1	0	4
20117AEC52	Cell and Tissue Culture	4	1	0	3
20117AEC53	Industrial Biotechnology	4	1	0	4

20117DSC54_	Discipline Specific Elective - I	4	1	0	3
	PRACTICAL				
20117AEC55L	Food and Agricultural Biotechnology, Tissue Culture Lab	0	0	3	2
20117AEC56L	Industrial Biotechnology Lab	0	0	3	2
	RESEARCH SKILL BASED COURSE				
20117BRC57	Participation in Bounded Research	-	-	-	
	Total	**16**	**4**	**6**	**19**
	AUDIT COURSE				
201ACLSPSL	Professional Skills	0	0	0	**2**

SEMESTER – VI

Course Code	Course Title	L	T	P	C
	THEORY				
20117AEC61	Plant and animal Biotechnology	4	1	0	4
20117SEC62	Applied Biotechnology	4	1	0	5
20117DSC63_	Discipline Specific Elective – II	4	1	0	3
201--OEC (2 DIGIT COURSE Name)	Open Elective	4	0	0	2
	PRACTICAL				
20117SEC64L	Plant and Animal Biotechnology Lab	0	0	3	2
20117AEC65L	Applied Biotechnology Lab	0	0	3	2
20117PRW66	Project Work	-	-	-	4
20117PROPEE	Programme Exit Examination	-	-	-	1
	Total	16	3	**6**	**23**
	AUDIT COURSE				
201ACSSIST	Interview Skills Training and Mock Test	-	-	-	**2**
201ACLSCET	Community Engagement	-	-	-	**1**
Total Credits for the Programme					**115**
Total Credits - Audit Courses					**19**

Discipline Specific Electives

Semester	Discipline Specific Elective Courses-I
V	a) 20117DSC54A - Bioinformatics and Biostatistics

	b) 20117DSC54B – rDNA Technology c) 20117DSC54C – Sericulture Technology d) 20117DSC54D – Fish Processing Technology
	Discipline Specific Elective Courses-II
VI	a) 20117DSC63A -Environmental Biotechnology b) 20117DSC63B - Environmental Management c) 20117DSC63C – Bioprocess technology and Fish Processing d) 20117DSC63D – Medical Biotechnology e) 20117DSC63E – Microbial Biotechnology

Open Electives

Semester	Open Elective Courses
VI	a. 201TNOEC-Tamil Ilakkiya Varalaru b. 201ENOEC-Journalism c. 201MAOEC-Development of Mathematical Skills d. 201PHOEC-Instrumentation e. 201CEOEC-Food and Adulteration f. 201CSOEC – E-Learning g. 201CAOEC-Web Technology h. 201CMOEC-Banking service

Credit Distribution

Sem	AEC	SEC	DSC	OEC	Research	Others	Total
I	17	-	-	-	-	-	17
II	17	-	-	-	1	-	18
III	17	-	-	-	2	-	19
IV	17	-	-	-	-	2	19
V	15	-	3	-	1	-	19
VI	6	7	3	2	4	1	23
Total	**89**	**7**	**6**	**2**	**8**	**3**	**115**

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M.Sc., BIOTECHNOLOGY– REGULATION 2020
COURSE STRUCTURE

Course Code	Course Title	L	T	P	C
	SEMESTER I				
20217SEC11	General Microbiology	6	1	0	5
20217SEC12	Molecular Genetics	6	1	0	5
20217SEC13	Biochemistry	6	1	0	4
20217SEC14L	Microbiology & Molecular Genetics – Lab	0	0	4	2
20217DSC15_	Discipline specific elective I	5	0	0	4
20217RLS16	Research Led Seminar	-	-	-	1
	Total	**23**	**3**	**4**	**21**
	SEMESTER II				
20217SEC21	Cell & Molecular Biology	5	1	0	5
20217SEC22	Biophysics & Bioinformatics	5	1	0	5
20217SEC23	Industrial Biotechnology	5	0	0	4
20217SEC24L	Molecular Biology & Industrial Biotechnology – Lab	0	0	4	2
20217DSC25	Discipline specific elective II	5	0	0	4
20217RMC26	Research Methodology	3	0	0	2
20217BRC27	Participation in Bounded Research	-	-	-	2
	Total	**23**	**2**	**4**	**24**
	SEMESTER III				
20217SEC31	Genomics	6	1	0	6
20217SEC32	Proteomics	6	1	0	6
20217SEC33L	Genomics & Proteomics - Lab	0	0	5	3
20217DSC34_	Discipline specific elective III	5	0	0	4
202_OEC	Open Elective	4	0	0	3
20217SRC35	Design\socio technical research	-	-	-	2
	Total	**21**	**2**	**5**	**24**
	SEMESTER IV				
20217SEC41	Food Technology	6	1	0	6
20217SEC42	Bio instrumentation	6	1	0	6
20217SEC43L	Food technology and Bio instrumentation lab	0	0	5	3
20217DSC44	Discipline specific elective IV	5	0	0	4
20217PRW45	Project work	-	-	-	6
20217PEE	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)20217DSC15A- Immunology b)20217DSC15B- Biosafety and biodiversity
	Discipline specific Elective Courses-II
II	a)20217 DSC25A- Endocrinology b)20217 DSC25B- Bioethics and IPR
	Discipline specific Elective Courses-III
III	a)20217 DSC34A- Nanobiotechnology b)20217 DSC34B- Environmental biotechnology
IV	**Discipline specific Elective Courses-IV**
	a)20217 DSC44A-Gene theraphy utilization pharmocology b)20217 DSC44B- Plant conservation & disaster management

Open Electives

Semester	Open Elective Courses
III	a. 202ENOEC-Writing for the media b. 202MAOEC-Applicable Mathematics Techniques c. 202PHOEC-Bio-Medical Instrumentation d. 202CHOEC-Green Chemistry e. 202CSOEC – M-Marketing f. 202CMOEC- Financial Services

Credit Distribution:

Sem	SEC	DSC	OEC	RSB Courses	Others	Total
I	16	4	-	1	-	21
II	16	4	-	4	-	24
III	15	4	3	2	-	24
IV	15	4	-	6	2	27
Total	**62**	**16**	**3**	**13**	**2**	**96**

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DEPARTMENT OF BIOTECHNOLOGY

M.PHIL SYLLABUS - REGULATION 2020

COURSE STRUCTURE

SEMESTER - I					
COURSE CODE	COURSE TITLE	L	T	P	C
20MBM011 (Common Paper)	Research Methodology	3	0	0	4
20BITC12	Advanced Biotechnology	4	0	0	4
20BIE33_	A. Environmental Biotechnology B. Microbial Genomics	4	0	0	4
20BRP014	Research and Publication Ethics	-	-	-	2
	Total	18	00	00	18
SEMESTER - II					
20BITD21	Dissertation - (Topic selected should be relevant to the topic of the In-depth paper				10

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Annexure II - Revised Value added courses

1. Certificate course in Bioinformatics
2. Certificate course in Enzyme Production

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SERICULTURE TECHNOLOGY

Course Code	Course	L	T	P	C
20117DSC54C	Sericulture Technology	4	1	0	3

Unit- I

Introducing the Basics of Sericulture, Mulberry Cultivation, Familiarising With the Methods of Propagation, Understanding the Nutritional requirements, Getting to know irrigation

Unit - II

Pruning of mulberries, Harvesting Mulberries, Understanding Pest Management, Understanding the History of Silkworm, Classification of silkworm, Morphology and Physiology of Mulberry Silkworm

Unit - III

Comprehending the structure of Silkglands, Rearing House and Silkworm Rearing, Disinfecting Rearing house, Incubation of Silkworm Eggs and Chawki Worm Rearing, Understanding the different stages of rearing

Unit - IV

Understanding pests and diseases of silkworm, Studying the Post Cocoon Technology

Unit - V

Listing the By-Product Utilisation and Rearing of Non mulberry silk worms, Exploring sustainability of rural economy using sericulture

Books and references

1. An Introduction to Sericulture by Ganga.
2. Sericulture Manual by R K Patnaik.
3. Silk Culture by S K Ananthanarayanan.
4. Problems and Prospects of Sericulture by M.L. Narasaiah.
5. Sericulture 2003 by Harryraj.
6. Hand book of Silkworm Rearing by Tazim Fuji
7. Shoot Feeding and Sericultural Trends by Sathe, T V & S H Thite

FISH PROCESSING TECHNOLOGY

Course Code	Course	L	T	P	C
20117DSC54D	Fish Processing Technology	4	1	0	3

Objective

To give a detailed insight into various aspects of fish processing technology

Unit I

Introduction to fish processing:- Importance of fish in human diet; Chemical constituents in fish; Causes of fish spoilage; principles of fish preservation, Importance of processing; Handling of fish and transportation.

Unit II

Traditional methods of fish processing:- Icing, Drying, Salting, Smoking, Pickling, Fermentation.

Unit III

Use of ice as a cooling medium:- Icing of fish, different types of ice and their manufacture. CSW, RSW. Freezing of fish – slow freezing and quick freezing, freezing curve. Different types of freezers. Quality changes during frozen storage. Theory of freezing damage. Basic refrigeration cycle

Unit IV

Canning: Unit steps in canning and their significance. Retort pouch. Can corrosion, Botulism, spoilage of canned fish.

Unit V

Value addition and product development:- Minced based products, coated products, IQF products; Waste utilization: Fish meal, fish oil, Chitin and chitosan

References

1. Balachandran KK. 2001. Post Harvest Technology of Fish and Fish Products. Daya Publ.
2. Gopakumar K. (Ed.). 2002. Text Book of Fish Processing Technology. ICAR. 198
3. Sen DP. 2005. Advances in Fish Processing Technology. Allied Publ.
4. Venugopal V. 2006. Seafood Processing. Taylor & Francis.
5. Wheaton FW & Lawson TB. 1985. Processing Aquatic Food Products. John Wiley & Sons.

BIOPROCESS TECHNOLOGY AND DOWNSTREAM PROCESSING

Course Code	Course	L	T	P	C
20117DSC63C	Fish Processing Technology	4	1	0	3

Unit 1: Concept of Fermentation and Bioprocess technology
The fundamental concept of Fermentation and bioprocess technology, Types of bioprocesses, Design and formulation of Media for industrial bioprocess, Criteria for medium design, carbon/nitrogen sources, nutrients, Sterilization of media

Unit 2: Bioreactors-design, types and operation
Bioreactors, bioreactor design, criteria, operation and types of bioreactors., Agitation and aeration in the bioreactor, impeller and sparger design. Concept of scale up, scale up challenges.

Unit 3: Downstream processing
Downstream processing: definition, cost involved in downstream processing, Typical steps involved in Downstream processing, Criteria for downstream processing, Target application of product vs cost, separation of cells and broth. Methods for cell breakage for harvesting intercellular products.

Unit IV: Bioprocess based products and application
Commercial production of various bioprocess based products (Bioethanol, butanol, citric acid, acetic acid) Antibiotics-penicillin, streptomycin, tetracycline.

UNIT V: Waste Management
Single cell protein; amino acids: glutamic acid, lysine. Types and nature of wastes generated from bioprocesses.

Books and references

1. Belter, P.A. and Cussler, E.L. Hu, W.S (1988), Bioseparation: Downstream processing for Biotechnology, Wiley, New York.
2. Ladisch, M.R., (2001), Bioseparation Engineering: Principles, Practice and Economics, Wiley, Interscience.

MEDICAL BIOTECHNOLOGY

Course Code	Course	L	T	P	C
20117DSC63D	Medical Biotechnology	4	1	0	3

UNIT 1

Classification and biochemical importance, chemistry and and functions of Monosaccharides, disaccharides and polysaccharides including Glycosaminoglycans (Mucopolysaccharides). Synthesis and break down of glycogen, glycolysis, gluconeogensis HMP shunt pathway and its biological significance. pathway. Metabolism of Galactose and Galactosemia. Blood sugar level and its regulation, oral GTT and glycosuria, Biochemistry of diabetes mellitus.

UNIT 2

General nature, classification, specificity and mode of action of enzymes, factors affecting enzyme activity. Clinical importance (Diagnostic, therapeutic) of enzymes.

UNIT 3

Multiple drug resistant bacteria and their biofilm lifestyle. Microbial diseases of skin and eye, nervous system, cardiovascular & lymphatic system, respiratory, and digestive system

UNIT 4

Introduction to genetic counselling and ethics, bPrenatal and post natal diagnosis of genetic disorders. Online Mendelian Inheritance in Man (OMIM), Introduction to Human Genome Project

UNIT 5

History and Introduction, Ethics and genetic engineering, Genetic Privacy, Patent of genes, Human races, Trading Human Life, Human Cloning, Stem Cells, Eugenics, Christian faith, Human genome and religious considerations, Case Studies and Final Considerations

REFERENCES

1. The principles of Biochemistry by A. Lehninger, D. Nelson, and M. Cox, 5th edition, M. W.H. Freeman and Company, New York, 2008.
2. 2. Metabolic Pathways by D. M. Greenberg, 3rd edition, Academic Press, Elsevier Science & Technology Books, 2014.Genetics A molecular approach, P. J. Russell., Pearson Benjamin Cummings, San Francisco Boston, New York, 2006.
3. Principles of genetics by Tamarin, 7th edition, The McGraw Hall Companies USA, 2002.
4. Intellectual Property Rights by C.B. Raju, 1st edition, Serials Publications, 2007.
5. Law Relating to Intellectual Property by B. L. Wadehra, Universal Law Publishing, CO., Fourth Edition, 2007.

MICROBIAL BIOTECHNOLOGY

Course Code	Course	L	T	P	C
20117DSC63E	Microbial Biotechnology	4	1	0	3

UNIT-I

History of Microbiology. Microscopy and applications. Microbial diversity – Bacteria, fungi, viruses, protozoa. Microbial nutrition and growth. Microorganisms as factories for the production of novel compounds.

UNIT-II

Biotechnological potentials of microalgae in food, feed, colorants and fuel. Cultivation methods of algae with reference to Dunaliella. Production of microbial biofertilizers – Diazotrophs, VAM and Cyanobacteria. Edible Mushroom cultivation.

UNIT-III

Microbial bioconversion of cellulosic and non-cellulosic wastes. Biopolymers and bioplastics. Bioremediation of wood, fuels, lubricants, rubber, Plastics. Microbiology of degradation of xenobiotics in environment: oil pollution, surfactants, pesticides.

UNIT-IV

Biological control of insects, bacterial, fungal and Viral diseases. Mode of action of biological control involved in different biocontrol agents. Genetics of antimicrobial metabolite production in biocontrol bacteria.

UNIT-V

Waste utilization: Waste water treatment - Aerobic and Anaerobic processes, Treatment schemes for waste waters of dairy, distillery, tannery, sugar, Antibiotic industries. Sewage disposal, compost making, methane generation.

TEXT BOOKS

1. Bernad R. Glick and Jack J. Pasternak. Molecular Biotechnology Principles and Applications of Recombinant DNA. WCB, 2002
2. Glazer, A.N. and Nikaido, H. Microbial Biotechnology: Fundamentals of Applied Microbiology 2nd edn. Cambridge University Press, 2007.
3. R.C. Dubey. Text Book of Biotechnology. S. Chand & Co., New Delhi. 2008.

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DEPARTMENT OF BIOTECHNOLOGY

CERTIFICATE COURSE SYLLABUS

ACADEMIC YEAR 2021-2022

ENZYME PRODUCTION

Subject code: 21517EPN

COURSE OUTCOME

- Acquired knowledge about the nomenclature and properties of enzymes.
- Learnt about enzyme production and its applications

UNIT I

Enzyme -Introduction, properties, nomenclature and classification, applications of enzymes in Industrial, Medical, Analytical, Chemical, Pharmaceutical and Food Sectors.

UNIT II

Industrial applications of enzymes, perspective of use of enzyme in Industry source. Significance and applications of cellulases (cellulose hydrolysis), Proteases (protein hydrolysate), Amylase (maltodextrin preparation), Lipases (oil industry), pectinases (clarification of fruit juices), Laccases (delignification), Asperaginase

UNIT III

Extremozymes- Microbial source, characteristics and biotechnological significance of extremozymes from thermophiles, psychrophiles, acidophiles, alkalophiles, halophiles. Solvent resistant enzymes. Biosurfactants

UNIT IV

Methods of enzyme production - Isolation of microorganisms, Strain development and preparation of inoculums, medium formulation, sterilization and inoculation of culture, maintenance of culture and fluid filtration, purification of enzymes. Immobilization of enzymes, production and applications of proteases, pectinases, cellulase, amylase.

UNIT V

Microbial enzymes-Commercial microbial enzyme production, detergent enzymes, starch processing enzymes, enzymes in cheese production enzymes in plant juice production, enzymes in textile manufacture, enzymes in leather manufacture, enzymes used in the treatment of wood pulps.

REFERENCE

1. Palmer, T. (2004) Enzymes: Biochemistry, Biotechnology and Clinical Chemistry, Affiliated East West Press Pvt. Ltd., New Delhi
2. Principles of Fermentation Technology by P.F. Stanbury, A. Whitaker and S.J. Hall, Butterworth Heineman, Aditya Books (P) Ltd.
3. Industrial Microbiology by A.H. Patel
4. Wiseman, A: Handbook of Enzyme Biotechnology, 3rd Edition, Ellis Horwood Publication

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Department of Biotechnology
School of Arts & Science
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DEPARTMENT OF BIOTECHNOLOGY

CERTIFCATE COURSE SYLLABUS

ACADEMIC YEAR 2021-2022

BIOINFORMATICS

Subject code: 21517BIF

Course outcome

1. Students know the creation and advancement of databses, softwares, computational and statistical techniques and theory to solve problems generated from the management and analysis of biological data.
2. Student to understant the computational biology - hypothesis based investigation of a specific biological problem using computers, carried out with experimental or simulated data, with the primary goal of discovery and the advancement of biological knowledge.
3. Bioinformatics solves the following problems and put more emphasis on understanding the disease related problems at molecular level.
4. Protein sequencing, Nucleic acid sequencing and their analysis. Find proteins their interaction, activity, modification and function.
5. Elucidation of function of a molecule based on its structure. Gene expression, analysis, prediction and establish genomic library. Find homology for studying evolutionary relationship among different species. Molecular modeling and molecular dynamics methods to study structure from sequence.

UNIT I:

Nucleotide Sequence Databases And Analysis, Goals of the Human Genome Project, cloning vectors, concept of maps, physical maps, shotgun libraries, DNA polymorphism, nucleotides, DNA sequences. Sequence databases: GeneBank, EMBL Nucleotide sequence databank.

Unit-II

Database formats - Recombinant DNA technology, restriction enzymes, resource for restriction enzyme (REBASE), similarity search. Polymerase chain reaction, primer selection for PCR, BLASTn, application of BioEdit.

Unit-III

Proteomics classification; Tools and techniques in proteomics; 2-D gel

electrophoresis, gelfiltration, PAGE, isoelectrick focusing, affinity chromatography, HPLC, ICAT, fixing andspot visualization, Mass spectroscopy for protein analysis, MALDI-TOF, Electrospray ionization (EST). Tandem mass spectroscopy (MS/MS) analysis; tryptic digestion and peptide fingerprinting (PMF).

UNIT- IV

Biodiversity Informatics- Definition, genetic diversity, species diversity, ecosystem diversity.Biodiversity over geographic scales, α-diversity, β-diversity, γ-diversity. Distribution of biodiversity, hotspots of biodiversity, ecological and economic role of biodiversity, scientificrole and environmental economics.

UNIT-V

Applications Of Bioinformatics In Various Fields: Environment, biotechnology, molecular biology, neurobiology, agriculture, drug designing, biomedical genome medicines, medicalmicrobiology.

References:

1. Introduction to Bioinformatics, (Atwood, T. K. and Parry-Smith, D. J).
2. An introduction to Computational Biochemistry, (C. Stain Tsai, A. John Wiley and Sons, Inc., publications).
3. Bioinformatics; Methods and applications; Genomics, Proteomics and Drug Discovery; (Rastogi, S. C. and Mendiratta and Rastogi, P.
4. Bioinformatics; A practical guide to the analysis of genes and proteins.; Edited by, Andreas D. Baxevanis and Francis Oulelette

HOD

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

DEAN

Dean of Arts & Science
PRIST Deemed to be University
Thanjavur - 613 403, Tamilnadu.

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SCHOOL OF ARTS AND SCIENCE
DEPARTMENT OF MATHEMATICS

BOARD OF STUDIES COMMITTEE MEETING
CIRCULAR

Date: 04.05.2021

There will be a Board of Studies Meeting on 07.06.2021 at 3.00 p.m. in the Dept. of Mathematics.

All the staff members are required to attend the meeting.

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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 07.06.2021 at 3p.m. in the Dept. of Mathematics, PRIST Deemed to be University, Thanjavur under the chairmanship of Dr.S.Subramanian.

The following members were present:

Sl.No	Name of The Member	Position	Role
1	Dr. S. Subramanian	HOD	Chair Person
2	Dr. L.Chinnappa	Dean of Arts & Science	Ex-Office, BOS
3	Dr. V. Ramadoss	Professor	Internal Member
4	Prof. A. Paneer Selvam	Associate Professor	Internal Member
5	Dr. A.Usha	Assistant Professor	Internal Member
6	Dr. K. Selvaraj	Assistant Professor	Internal Member
7	Dr. D.R. Kirubaharan	Assistant Professor	Internal Member
8	Dr. N.Saivaraju	Professor	External Member
9	Dr. A. Mohan	Professor	External Member

The Chairman (BOS) welcomed all the members and presented the feed backs about existing curriculum received from various Stack 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 **Mathematics** M.Sc **Mathematics** and M.Phil) in detail and they marked no changes in course structure and they suggest to change the contents of the papers like Operations Research (UG), Astronomy(UG), Functional Analysis(PG), Image Processing (PG) and some other

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papers in forthcoming BOS meeting and also add some new value added courses like, mathematics for competitive Exam, Quantitative Aptitude and Matlab..

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

The Meeting concluded with thanks from Board of Studies Chairman.

Signature of the Chairman & Members

Sl. No	Signature
1	
2	
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SCHOOL OF ARTS AND SCIENCE

DEPARTMENT OF MATHEMATICS

B.Sc., MATHEMATICS - REGULATION 2020

COURSE STRUCTURE

SEMESTER – I

Course Code	Course Title	L	T	P	C
	THEORY				
20110AEC11/ 20111AEC11/ 20132AEC11/ 20135AEC11	Tami – I/Advanced English-I/Hindi-I/ French - I	4	0	0	2
20111AEC12	English-I	4	0	0	2
20112AEC13	Differential Calculus and Vector Calculus	5	0	0	3
20112AEC14	Trigonometry, Analytical Geometry 3D and Calculus	5	0	0	3
20120AEC15	Programming in C	6	0	0	5
	PRACTICAL				
20120AEC16L	Programming in C Lab	0	0	3	2
	Total	24	0	3	17
	AUDIT COURSE				
201ACLSICN	Indian Constitution	-	-	-	2
201ACLSUHV	Universal Human Values	-	-	-	2

SEMESTER – II

Course Code	Course Title	L	T	P	C
	THEORY				
20110AEC21/ 20111AEC21/ 20132AEC21/ 20135AEC21	Tamil – II/ Advanced English-II/Hindi-II/ French – II	4	0	0	2
20111AEC22	English-II	4	0	0	2
20112AEC23	Integrals & Differential Equations	5	0	0	3
20112SEC24	Sequence and series	5	0	0	4
20120AEC25	Web Programming	5	1	0	5
	PRACTICAL				
20120AEC26L	Web Programming Lab	0	0	3	2
	RESEARCH SKILL BASED COURSE				
20112RLC27	Research Led Seminar	-	-	-	1

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	Total	23	1	3	18
	AUDIT COURSES				
201ACLSCOS	Communication Skills	-	-	-	2
201ACSSBBE	Basic Behavioral Etiquette	-	-	-	2

SEMESTER – III

Course Code	Course Title	L	T	P	C
	THEORY				
20110AEC31/ 20132AEC31/ 20111AEC31/ 20135AEC31	Tamil – III/Hindi-III/Advanced English-III/ French – III	4	0	0	2
20111AEC32	English-III	4	0	0	2
20112AEC33	Number Theory	4	0	0	3
20112AEC34	Numerical Analysis	4	0	0	3
20118AEC35	Mathematical Statistics-I	5	1	0	5
	PRACTICAL				
20118AEC36L	Mathematical Statistics-I Lab	0	0	3	2
	RESEARCH SKILL BASED COURSE				
20112RMC37	Research Methodology	2	0	0	2
	Total	**23**	**1**	**3**	**19**
	AUDIT COURSE				
201ACLSOAN	Office Automation	-	-	-	2

SEMESTER – IV

Course Code	Course Title	L	T	P	C
	THEORY				
20110AEC41/ 20111AEC41/ 20132AEC41/ 20135AEC41	Tamil-IV/Advanced English-IV /Hindi-IV/ French – IV	4	0	0	2
20111AEC42	English-IV	4	0	0	2
20112SEC43	Operations Research	4	0	0	3
20112AEC44	Astronomy	4	0	0	3
201ENSTU45	Environmental Studies	2	0	0	2
20118AEC46	Mathematical Statistics-II	5	1	0	5
	PRACTICAL				
20118AEC47L	Mathematical Statistics- II Lab	0	0	3	2
	Total	**23**	**1**	**3**	**19**
	AUDIT COURSE				
201ACLSLMS	Leadership and Management Skills	-	-	-	2

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201ACSSAQA	General Aptitude and Quantitative Ability				2

SEMESTER – V

Course Code	Course Title	L	T	P	C
	THEORY				
20112AEC51	Modern Algebra	5	0	0	4
20112AEC52	Real Analysis	5	1	0	4
20112SEC53	Statics	5	1	0	4
20112SEC54	Programming in C++	5	0	0	3
20112DSC55_	Discipline Specific Elective -I	5	0	0	3
	RESEARCH SKILL BASED COURSE				
20112BRC56	Participation in Bounded Research	-	-	-	1
	Total	**25**	**2**	**0**	**19**
	AUDIT COURSE				
201ACLSPSL	Professional Skills	-	-	-	2

SEMESTER – VI

Course Code	Course Title	L	T	P	C
	THEORY				
20112AEC61	Complex Analysis	5	0	0	4
20112SEC62	Dynamics	5	1	0	4
20112AEC63	Discrete Mathematics	5	0	0	4
20112DSC64_	Discipline Specific Elective –II	5	0	0	4
201__OEC(2 Digit Course Name)	Open Elective	4	0	0	2
	PRACTICAL				
20120SEC65L	Project Work	-	-	-	4
20120SEC66L	Program Exit Examination	-	-	-	1
	Total	**24**	**1**	**0**	**23**
	AUDIT COURSE				
201ACSSIST	Interview Skills Training and Mock Test	-	-	-	**2**
201ACLSCET	Community Engagement	-	-	-	**1**
Total Credits -Programme					**115**
Total Credits - Audit Courses					**19**

Discipline Specific Electives

Semester	Discipline Specific Elective Courses-I
V	a) 20112DSC55A – Fuzzy Analysis b) 20112DSC55B - Formal Languages and Automata Theory
	Discipline Specific Elective Courses-I
VI	a) 20112DSC64A - Graph Theory b) 20112DSC64B - Mathematical Modelling

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Open Electives

Semester	Open Elective Courses
VI	a) 201TNOEC-Tamil IlakkiyaVaralaru b) 201ENOEC-Journalism c) 201PHOEC-Instrumentation d) 201CEOEC-Food and Adulteration e) 201BTOEC- Wildlife Conservation f) 201CSOEC – E-Learning g) 201CAOEC-Web Technology h) 201CMOEC-Banking service

Credit Distribution

Sem	AEC	SEC	DSC	OEC	Research	Others	Total
I	17	-	-	-	-	-	17
II	13	4	-	-	1	-	18
III	17	-	-	-	2	-	19
IV	14	3	-	-	-	2	19
V	8	7	3	-	1	-	19
VI	8	4	4	2	4	1	23
Total	77	18	7	2	8	3	115

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M.Sc., MATHEMATICS -CURRICULUM – REGULATION 2020

COURSE STRUCTURE

Course Code	Course Title	L	T	P	C
	SEMESTER I				
20212AEC11	Algebra	6	0	0	4
20212AEC12	Real Analysis	7	0	0	4
20212AEC13	Ordinary Differential Equations	6	0	0	4
20220SEC14	C++ Programming	6	0	0	4
20212DSC15_	Discipline Specific Elective – I	5	0	0	4
20212RLC16	Research Led seminar	-	-	-	1
	Total	**30**	**0**	**0**	**21**
	SEMESTER II				
20212AEC21	Complex Analysis	5	1	0	4
20212AEC22	Measure Theory and Integration	5	0	0	4
20212SEC23	Mathematical Methods	6	0	0	4
20212AEC24	Graph Theory	5	0	0	4
20212DSC25_	Discipline Specific Elective – II	5	0	0	4
20212RMC26	Research Methodology	3	0	0	2
20212BRC27	Participation in Bounded Research	-	-	-	2
	Total	**29**	**1**	**0**	**24**
	SEMESTER III				
20212AEC31	Topology	6	0	0	5
20212SEC32	Stochastic Process	6	1	0	5
20212AEC33	Advanced Numerical Analysis	6	1	0	5
20212DSC34_	Discipline Specific Elective – III	5	0	0	4
202__OEC	Open Elective	4	0	0	3
20212SRC36	Participation in Scaffold Research (Societal Project)	-	-	-	2
	Total	**27**	**2**	**0**	**24**
	SEMESTER IV				
20212AEC41	Functional Analysis	5	1	0	5
20212SEC42	Visual Programming	6	1	0	5
20212AEC43	Number Theory	6	0	0	5
20212DSC44_	Discipline Specific Elective – IV	5	0	0	4
20212PRW45	Project Work	0	0	0	6
20212PEE	Programme for Exit Examination	0	0	0	2
	Total	**22**	**2**	**0**	**27**
	Total Credits for the Programme				**96**

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Discipline Specific Electives

Semester	Discipline Specific Elective Courses
I	a) 20212DSC15A- Classical Dynamics b) 20212DSC15B- Fluid Dynamics
II	a) 20212DSC25A- Mathematical Probability b) 20212DSC25B- Mathematical Modelling
III	a) 20212DSC34A- Cryptography b) 20212DSC34B- Algebraic Coding Theory
IV	a) 20212DSC44A- Combinatorial Mathematics b) 20212DSC44B- Design And Analysis of Algorithm

Open Electives

Semester	Open Elective Courses
III	a) 20211OEC-Writing For the Media b) 20213OEC-Bio-medical Instrumentation c) 20214OEC-Green Chemistry d) 20215OEC-Herbal Medicines e) 20220OEC-M-Marketing f) 20261OEC- Financial Service g) 20280OEC-Counselling and Psychology

Credit Distribution:

Sem	AEC	SEC	DSC	OEC	Research	Others	Total
I	12	04	04	-	01	-	21
II	09	03	04	-	05	-	21
III	10	05	04	02	02	-	23
IV	10	05	04	-	06	02	29
Total	**41**	**17**	**16**	**02**	**14**	**02**	**92**

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DEPARTMENT OF MATHEMATICS

M.Phil
SYLLABUS

(REGULATION 2020)

DEPARTMENT OF MATHEMATICS

COURSE STRUCTURE

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SEMESTER - I					
COURSE CODE	COURSE TITLE	L	T	P	C
203___11 (Common Paper)	Research Methodology	2	2	0	2
203MAC12	Algebra and Analysis	2	2	0	2
203MAC13	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					
203MAC31	Project Work				02

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Course Code	Course Title	L	T	P	C
21512VAQAR	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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Course Code	Course Title	L	T	P	C
21512VAMCE	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 Divisiblity, 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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Regulation 2021
VALUE ADDED COURSE

DIPLOMA

Duration: 90 Hours

Course Code	Course Title	L	T	P	C
21VADML	MAT LAB	4	0	0	2

Duration : 90 hours

Objectives

1. To bridge the skill gaps and make students industry ready.
2. To provide an opportunity to students to develop inter-disciplinary skills.
3. To Impart the Knowledge to the students with MATLAB software. [This enhances programming knowledge in Research and Developmeal].
4. To provide a working introduction to the Matlab technical computing environment. [Themes of data analysis, visualization, and programming].

Topics to be covered:

1. Basics of Matlab and MATLAB Compiler
   The Matlab user interface
   Working with Matlab data types
   Creating matrices and arrays
   Operators and control statements
   Using scripts and functions
   Data import and export
   Using the graphical features

2. Programming with simple examples

3. Discussion of Toolboxes with Applications □ Signal Processing □ Image Acquisition Toolbox □ Image Processing □ Neural Network □ Fuzzy Logic Toolbox

4. Simulink and Hardware Interfacing (Using Kits: Lego, Raspberry Pi, Mind storms etc.)

Learning Resources and References:

[1] http://www.eng-tips.com/threadminder.cfm?pid=575
[2]http://www.matlabtutorials.com/mathforum/
[3] http://www.mathworks.in/matlabcentral/
[4] http://www.cfd-online.com/Forums/tags/matlab.html
[5] http://diydrones.com/forum/topic/listForTag?tag=Matlab
[6] MATLAB Manuals and Handbooks

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

The Board of Studies meeting for the department of Biochemistry is held on 04.06.2021 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 (Chairman , BOS)
2. Dr.L.Chinnappa / Dean (EX-Offico,BOS)
3. Dr.A.Sohna Chandra Packiavathi Prof (Member, BOS)
4. Dr.S.Ambiga/ Associate Prof (Member, BOS)
5. DR.S.Sathishkumar/ Assistant Prof (Member, BOS)
6. MR.R.Viswalingam/ Assistant Prof (Member, BOS)
7. DR.A.Sundaresan / Assistant Prof (Member, BOS)
8. Dr. K. Jeyaprakash/ Head and Associate Professor , Dept of Biochemistry, Rajah Serfoji Government College (Autonomous), Thanjavur, (External Member, BOS)
9. Mr. Ashok Ramachandran/ Manager, In vitro Diagnostics (IVD), Lab Care Diagnostic (India) Pvt Ltd, Sarigam, Gujarat (External Member, BOS)

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

The chairman briefed about the programmes and the curriculum. The committee carefully reviewed the curriculum and suggested no changes.

The following value-added courses are introduced - Certificate course in Nanotechnology, Diploma Course in Clinical Research and Certificate course in herbal cosmetics.

The committee prepared the list of examiners and submitted the above for the academic council.

The Meeting concluded with thanks from Board of Studies Chairman.

Signature of the Chairman & Members

1. Dr. Bakrudeen Ali Ahamed
2. Dr.L.Chinnappa
3. Dr.A.Sobna Chandra Packiavathi
4. Dr.S.Ambiga
5. DR.S.Sathishkumar
6. MR.R.Viswalingam
7. DR.A.Sundaresan
8. Dr. K. Jeyaprakash
9. Mr. Ashok Ramachandran

Annexure I - Revised Curriculum structure Credits

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SCHOOL OF ARTS AND SCIENCE
DEPARTMENT OF BIOCHEMISTRY
B.Sc., BIOCHEMISTRY- REGULATION 2020
COURSE STRUCTURE
SEMESTER – I

Course Code	Course Title	L	T	P	C
	THEORY				
20110AEC11/ 20111AEC11/ 20132AEC11/ 20135AEC11	Tami – I/Advanced English-I/Hindi-I/ French - I	4	0	0	2
20111AEC12	English-I	4	0	0	2
20115AEC13	Biomolecules	6	1	0	5
20114AEC14	Chemistry –I	6	1	0	4
	PRACTICAL				
20115AEC15L	Biomolecules Lab-I	0	0	3	2
20114AEC16L	Volumetric Analysis Lab	0	0	3	2
	Total	20	2	6	17
	AUDIT COURSE				
201ACLSICN	Indian Constitution	-	-	-	2
201ACLSUHV	Universal Human Values	-	-	-	2

SEMESTER – II

Course Code	Course Title	L	T	P	C
	THEORY				
20110AEC21/ 20111AEC21/ 20132AEC21/ 20135AEC21	Tamil – II/ Advanced English-II/Hindi-II/ French – II	4	0	0	2
20111AEC22	English-II	4	0	0	2
20115AEC23	Biochemical Techniques	6	1	0	5
20114AEC24	Chemistry – II	6	1	0	4
	PRACTICAL				
20115AEC25L	Biochemical Techniques Lab-I	0	0	3	2
20114AEC26L	Organic Analysis Lab	0	0	3	2
	RESEARCH SKILL BASED COURSE				

20115RLC27	Research Led Seminar	-	-	-	1
	Total	20	2	6	18
201ACLSC08	AUDIT COURSES				
201ACSSDHE	Communication Skills	-	-	-	2
	Basic Behavioral Etiquette	-	-	-	2

SEMESTER – III

Course Code	Course Title	L	T	P	C
	THEORY				
20110AEC31/ 20132AEC31/ 20111AEC31/ 20135AEC31	Tamil – III/Hindi-III/Advanced English-III/ French – III	4	0	0	2
20111AEC32	English-III	4	0	0	2
20115AEC33	Cell Biology and Genetics	4	1	0	4
20120AEC34	Programming in C	4	1	0	5
	PRACTICAL				
20115AEC35L	Cell Biology and Genetics Lab	0	0	3	2
20120AEC36L	Programming in C Lab	0	0	3	2
	RESEARCH SKILL BASED COURSE				
20115RMC37	Research Methodology	2	0	0	2
	Total	18	2	6	19
	AUDIT COURSE				
201ACLSOAN	Office Automation	-	-	-	2

SEMESTER – IV

Course Code	Course Title	L	T	P	C
	THEORY				
20110AEC41/ 20111AEC41/ 20132AEC41/ 20135AEC41	Tamil-IV/Advanced English-IV /Hindi-IV/ French – IV	4	0	0	2
20111AEC42	English-IV	4	0	0	2
20115AEC43	Human Physiology	4	1	0	4
20120AEC44	Fundamentals of Computing	5	1	0	5
201ENSTU45	Environmental studies	2	0	0	2
	PRACTICAL				
20115AEC46L	Biochemical Techniques Lab-II	0	0	3	2
20120AEC47L	Web Design Lab	0	0	3	2
	Total	19	2	6	19
	AUDIT COURSE				

201ACLSLMS	Leadership and Management Skills	-	-	-	2
201ACSSAQA	General Aptitude and Quantitative Ability	-	-	-	2

SEMESTER – V

Course Code	Course Title	L	T	P	C
	THEORY				
20115AEC51	Enzymes	4	1	0	4
20115AEC52	Bioenergetics and Metabolism	4	1	0	3
20115AEC53	Immunology	4	1	0	4
20115DSC54_	Discipline Specific Elective -I	4	1	0	3
	PRACTICAL				
20115AEC55L	Food and enzyme Analysis Lab	0	0	3	2
20115AEC56L	Immunology Lab	0	0	3	2
	RESEARCH SKILL BASED COURSE				
20115BRC57	Participation in Bounded Research	-	-	-	1
	Total	16	4	6	19
	AUDIT COURSE				
201ACLSPSL	Professional Skills	-	-	-	2

SEMESTER – VI

Course Code	Course Title	L	T	P	C
	THEORY				
20115AEC61	Clinical Biochemistry	4	1	0	4
20115SEC62	Molecular Biology	4	1	0	5
20115DSC63_	Discipline Specific Elective -II	4	1	0	3
201—OEC (2 DIGIT COURSE Name)	Open Elective Course	4	0	0	2
	PRACTICAL				
20115AEC64L	Hematology and clinical biochemistry Lab	0	0	3	2
20115SEC65L	Molecular Biology Lab	0	0	3	2
20115PRW66	Project Work	-	-	-	4
20115PROEE	Program Exit Examination	-	-	-	1
	Total	16	3	6	23
	AUDIT COURSE				
201ACSSIST	Interview Skills Training and Mock Test	-	-	-	2
201ACLSCET	Community Engagement	-	-	-	1

Total Credits -Programme	115
Total Credits - Audit Courses	19

Discipline Specific Electives

Semester	Discipline Specific Elective Courses-I
V	a) 20115DSC54A – Pharmaceutical Biochemistry b) 20115DSC54B -Basic Biotechnology
	Discipline Specific Elective Courses-I
VI	a) 20115DSC63A - Biochemistry of plants and microbes b) 20115DSC63B – Hospital Managements

Open Electives

Semester	Open Elective Courses
VI	201TNOEC-Tamil Ilakkiya Varalaru 201ENOEC-Journalism 201MAOEC-Development of Mathematical Skills 201PHOEC-Instrumentation 201CEOEC-Food and Adulteration 201CSOEC – E-Learning 201CAOEC-Web Technology 201CMOEC-Banking service

Credit Distribution

Sem	AEC	SEC	DSC	OEC	Research	Others	Total
I	17	-	-	-	-	-	17
II	17	-	-	-	1	-	18
III	17	-	-	-	2	-	19
IV	17	-	-	-	-	2	19
V	15	-	3	-	1	-	19
VI	11	2	3	2	4	1	23
Total	94	2	6	2	8	3	115

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SCHOOL OF ARTS AND SCIENCE
M. Sc BIOCHEMISTRY -SYLLABUS – REGULATION 2020

Course Code	COURSE STRUCTURE Course Title	L	T	P	C
	SEMESTER I				
20215SEC11	Biomolecules	6	1	0	5
20215SEC12	Biochemical and Instrumental analysis	6	1	0	5
20215SEC13	Enzymology	6	1	0	4
20215SEC14L	Biochemical Techniques Lab - I	0	0	4	2
20215DSC15_	Discipline specific elective	5	0	0	4
20215RLC16	Research Led Seminar	-	-	-	1
	Total	23	3	4	21
	SEMESTER II				
20215SEC21	Cellular Biochemistry	5	1	0	5
20215SEC22	Metabolism and Regulation	5	1	0	5
20215SEC23	Neuro Biochemistry	5	0	0	4
20215SEC24L	Enzymology Lab- II	0	0	4	2
20215DSC25_	Discipline Specific Elective -II	5	0	0	4
20215RMC26	Research Methodology	3	0	0	2
20215BRC27	Participation in Bounded Research	-	-	-	2
	Total	23	2	4	24
	SEMESTER III				
20215SEC31	Molecular Biology	6	1	0	6
20215SEC32	Clinical Biochemistry	6	1	0	6
20215SEC33L	Clinical Biochemistry Lab	0	0	5	3
20215DSC34_	Discipline Specific Elective -III	5	0	0	4
202_OEC	Open Elective	4	0	0	3
20215SRC35	Design/Socio technical research	-	-	-	2
	Total	21	2	5	24
	SEMESTER IV				
20215SEC41	Molecular Basis of diseases	6	1	0	6
20215SEC42	Environmental Biochemistry	6	1	0	6
20215SEC43L	Molecular and Environmental biochemistry lab	0	0	5	3
20215DSC44_	Discipline Specific elective –IV	5	0	0	4
20215PRW45	Project Work	-	-	-	6
20215PEE	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)20215DSC15A- Biostatistics b) 20215DSC15B- Immunology
	Discipline specific Elective Courses-II
II	a)2015DSC25A- Endocrinology b)20215 DSC25B- Clinical nutrition and dietetics c) 20215 DSC25C – Bioinformatics
	Discipline specific Elective Courses-III
III	a)20215DSC34A- Genetics and Genetic Engineering b)20215DSC34B- Pharmaceutical Biotechnology
VI	a) 20215DSC44A – Medical Biotechnology b) 20215DSC44B – Applied Microbial Biochemistry

Open Electives

Semester	Open Elective Courses
III	202ENOEC - Writing for the media 202MAOEC - Applicable Mathematics Techniques 202PHOEC - Bio-Medical Instrumentation 202CHOEC - Green Chemistry 202CSOEC - M-Marketing 202CMOEC - Financial Services

Credit Distribution:

Sem	SEC	DSC	OEC	RSB Courses	Others	Total
I	16	4	-	1	-	21
II	16	4	-	4	-	24
III	15	4	3	2	-	24
IV	15	4	-	6	2	27
Total	62	16	3	13	2	

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VALUE ADDED COURSES

SYLLABUS

CERTIFICATE COURSE IN NANOTECHNOLOGY

Aim:

Nanotechnology is an interdisciplinary field and attracts students from various disciplines. This course provides basic overview of nanomaterials and their applications. This course begins with a review of various types of nanomaterials and an introduction to general terminologies. Subsequently the course covers synthesis methodologies, physical and chemical characterization of nanomaterials. Finally, case studies illustrating application of nanomaterials in diverse fields will be discussed.

Course objectives:

1. To understand the nature and properties of nanomaterials.
2. To provide scientific understanding of application of nanomaterials and nanotechnology in agriculture, health and environmental conservation

Unit I: Background to Nanoscience

Introduction to Nano-science and Nano-technology, Nano-scale material, implications for Physics, Chemistry, Engineering & Biology, and Motivation for Nanotechnology study. History & development of Nano-science and Nano-technology with the emphasis on history of Nano-metals, Chalcogenides& Boron Nitrite and Carbon Nanomaterials

Unit II: Types of nanostructure and properties of nanomaterials

One dimensional, Two dimensional and Three dimensional nanostructured materials, Quantum Dots shell structures, metal oxides, semiconductors, composites, mechanicalphysical-chemical properties. Classification of nanoparticles, layered nanoparticles (Clay), fibrillar nanoparticles (carbon nanotubes (CNTs) etc and other nanoparticles, polymer clay nano-composites (PCNC). Polymer nano-composites: definitions, incorporation of nanomaterials in polymer matrix

Unit III: Size Dependent Properties of Nanomaterials

Elucidation of the structure: chemistry and properties of Nano-structured materials. Variation in properties of micro and Nanomaterials. Length scale involved and effect on properties: mechanical, electronic, optical, magnetic and thermal properties.

Unit IV: Application of Nanomaterial

Ferroelectric materials, coating, molecular electronics and nanoelectronics, biological and environmental, membrane based application, polymer based application

References:

1. Rao, C. N. R., Müller, A., & Cheetham, A. K. (Eds.). (2006). The chemistry of nanomaterials: synthesis, properties and applications. John Wiley & Sons.
2. Nanoparticles: From theory to applications – G. Schmidt, Wiley Weinheim (2004).
3. Instrument E L Principe, P Gnauck and P Hoffrogge, Microscopy and Microanalysis (2005), 11: 830- 831, Cambridge University Press.
4. Processing & properties of structural nanomaterials - Leon L. Shaw, Nanochemistry: A Chemical Approach to Nanomaterials, Royal Society of Chemistry, Cambridge UK (2005).

DIPLOMA IN CLINICAL RESEARCH

Diploma in Clinical Research

Aim: The *aim* of the course is to have thorough insight on project management related to Introduction to *Clinical Trial*, is to find ways to more effectively prevent, diagnose, or treat disease

Course objective: The objective of clinical trials is to establish the effect of an intervention. Treatment effects are efficiently isolated by controlling for bias and confounding and by minimizing variation.

Course outcome: To monitored during a study to document the impact that a given intervention or exposure has on the health of a given population

Module 1: Introduction to Clinical Research

- Introduction to Clinical Research
- Terminologies and definition in Clinical Research
- Origin and History of Clinical Research
- Difference between Clinical Research and Clinical Practice
- Types of Clinical Research
- Phases of clinical research
- Career in Clinical Research

Module 2: Pharmacology

- Introduction to Pharmacology
- Concept of Essential Drugs
- Routes of Drug Administration
- Introduction to Drug Discovery and Development

Module 3: drug development

- Hurdles in Drug Development
- Sources of Drugs
- Basics of Drug Discovery & Development
- Approaches to Drug Discovery
- Evolutionary Classification of the strategies for Drug Discovery
- Emerging technologies in Drug Discovery
- Preclinical Testing
- Investigational New Drug Application
- Clinical trials
- New Drug Application and Approval
- Pharmacokinetics 16. Pharmacodynamics

Module 4: Guideline in Clinical Research

- Historical guidelines in Clinical Research
- Guidelines for Good Clinical Practice Glossary

Module 5: Clinical Trial Management

- Project Management
- Protocol in Clinical Research
- Informed Consent
- Case Report Form
- Investigator's Brochure (IB)
- Selection of an Investigator and Site 7. Clinical Trial Stakeholders

Reference Book:

1. Basic Principles of Clinical Research and Methodology-SK Guptaby ICRI
2. Fundamentals of Clinical Trail- Lawrence M.Friedman

3. Designing Clinical Research-Dr. Stephan B. Hulley

CERTIFICATE COURSE IN HERBAL COSMETICS

Objectives of course:

1. Understanding and recognition of various raw materials and their properties.
2. To formulate herbal cosmetics.
3. Analysis and testing methods in cosmetics.
4. Motivate students to take up cosmetics as a field of research for further education.

Learning Outcomes:

1. 1. Job opportunities in cosmetic industry
2. 2. Entrepreneurship in cosmetic fields

UNIT 1: Chemistry of oils and Fats. Fatty acids. Different types of oils. Saturation and Unsaturation. Analytical chemistry used in cosmetics. Instrumental analysis using pH meter, colorimeter, viscometer and TLC Principle and Evaluation. Method and principle for determination of heavy metals, chlorides and sulphates.

UNIT II:

Oils and Fats used in cosmetics - Botanical source, chemical constituents, Physical parameters and morphological aspects of fixed oils - Sesam, Groundnut, Mustard, Castor, Coconut and Sunflower. Botanical source, Morphological and physiological aspects of commonly used herbs - Brahmi, Neem, Aloe vera, Liquorice, Heena, cucumber, Tulsi, Ritha, Amla, Turmeric. Extraction of herbs -

UNIT III:

Different methods of extraction. Process for development of cosmetics. Different bases used in cosmetics. Basic theory of cream, oils and Gels. Raw materials used in cosmetics.

UNIT IV: Formulation of cosmetic products using herbs. Amla hair oil / Heena hair oil. Aloe vera Gel / Cucumber gel. Liquorice, Neem and Turmeric Cream. Importance of Quality control in cosmetic preparation and guidelines.

Reference Books :

1. Himadri Panda, Herbal cosmetics Handbook .3rd revised edition.
2. Handbook on herbal products.(Vol.1 and 2)NIIR Board of Technologists, Delhi.

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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	2021-22
Date and Time	12.05.2021 & 10:30 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 12.05.2021. 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 11.05.2020 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 obvious that content of core courses was retained without any modification. In addition, new elective course, Physics of Radiography(20113DSC64B) was included in place of Numerical Methods and C Programming (20113DSC64B) in the semester-VI. BOS members also suggested to include 3 new value added courses while retaining 4 courses.
Resolution: The board members recommended the above mentioned suggestions in UG curriculum

Agendum 3: Discussion about core and elective courses of PG curriculum
Discussion : The members discussed elaborately about the existing curriculum of PG courses. It was decided that content of core courses was retained without any modification. It was planned that content of core courses was retained without any modification. Nevertheless, 3 new elective courses were introduced in the semesters (II, III and IV). BOS members also recommended to include some new value added courses. New elective course, Renewable Energy (20213DSC25B) was included instead of Radiation Physics (20213DSC25B) in the semester – II. New elective course, Analog Systems and Applications (20213DSC34A) was included instead of Weather Forecasting (20213DSC34A) in the semester – III. New elective course, Elements of Modern Physics (20213DSC44A) was included instead of Nano Science and Technology (20213DSC44A) in the semester – IV.
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.

Signature
(Dr. M. Sivanantham)

Date: 12.05.2021 Dean

BOS Chairman/HOD Seal

Dean of Arts & Science
PRIST Deemed to be University
Thanjavur-613 403, Tamilnadu.

The Head, Department of Physics.
PRIST Deemed to be University
Vallam, Thanjavur-613403
Tamilnadu, India.

ATTENDANCE OF THE BOARD OF STUDIES MEETING

Board: Physics

Date: 12.05.2021

Time: 10:30 am

Venue: Department of Physics

The following members were present for the Board of Studies meeting

Chair: Dr. M. Sivanantham, M.Sc., M.Phil., Ph. D, Associate Professor & HOD

External Members

S.No.	Name/Degree/Designation	Institute/Organization/ Full address	Signature
1	Dr. T. GANESH, M.Sc., M.Phil., M. Tech., Ph.D., Associate Professor	Department of Physics Rajah Serfoji Government College, Thanjavur- 613005	T. Ganesh
2	K. Amirtha Ganesh, M.E., Chief Innovation Officer, Three Dots Innovations	Three Dots Innovations LLP Plot No.121, Rahman Nagar Neelagiri Thanjavur- 613004	K. Amirtha

Internal Members

S.No.	Name/Degree/Designation	Department	Signature
1	Dr. M. Sivanantham M.Sc., M.Phil., Ph.D, HOD, Associate Professor	Physics	M. Sivanantham
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	L. Chinnappa
3	Dr. S. Subashchandrabose, M.Sc., M.Phil., Ph.D, Professor	Physics	S. Subashchandrabose

4	Dr. Sutapa Ghosh M.Sc., Ph.D, Associate Professor	Physics	
5	Dr. V. Vidhya M.Sc., M.Phil., Ph.D, Assistant Professor	Physics	
6	Mr. K. Swaminathan, M.Sc., M.Phil., Assistant Professor	Physics	
7	Dr. K. Thirunavukarasu M.Sc., M.Phil., Ph.D, Assistant Professor	Physics	

S.No.	Name/Degree/Designation	Department/Class Institute/Organization/Address	Signature
1	Dr. L. Chinnappa, M.Sc., M. Phil, Ph.D., PGDCA., Dean & Professor, School of Arts and Science, PRIST Deemed to be University, Thanjavur	Dean & Professor, School of Arts and Science, PRIST Deemed to be University, Thanjavur	
2	M. Sivaraju, B. Sc., Student	PRIST Deemed to be University, Thanjavur	
3	M. Ramachandiran, Alumni	PRIST Deemed to be University, Thanjavur	

Date: 12.05.2021

Dean

Signature
(Dr. M. Sivanantham)

BOS Chairman/HOD Seal

Dean of Arts & Science
PRIST Deemed to be University
Thanjavur - 613 403, Tamilnadu.

The Head, Department of Physics
PRIST Deemed to be University
Vallam, Thanjavur-613403.
Tamilnadu, India.

List of new courses

1. Physics of Radiography
2. Renewable Energy
3. Analog Systems and Applications
4. Elements of Modern Physics

List of new value-added courses

1. Certificate course on Fiber Optics
2. Certificate course on Thin film techniques
3. Certificate course on communication electronic circuits

B.Sc., PHYSICS -COURSE STRUCTURE

Course Code	Course Title	L	T	P	C
	SEMESTER I				
	THEORY				
20110AEC11 20111AEC11 20132AEC11 20135AEC11	Tamil-I Advanced English-I Hindi-I French-I	4	0	0	2
20111AEC12	English-I	4	0	0	2
20113AEC13	Properties of Matter	5	1	0	4
20112AEC15A	Calculus and Fourier series	4	-	0	4
20112AEC16A	Algebra and Trigonometry	4	-	0	3
	PRACTICAL				
20113SEC14L	Properties of Matter Lab	0	0	3	2
	Total	**21**	**1**	**3**	**17**
	AUDIT COURSE				
201ACLSICN	Indian Constitution	-	-	-	2
201ACLSUHV	Universal Human Values	-	-	-	2

SEMESTER II

Course Code	Course Title	L	T	P	C
	THEORY				
20110AEC21 20111AEC21 20132AEC21 20135AEC21	Tamil-II Advanced English-II Hindi-II French-II	4	0	0	2
20111AEC22	English-II	4	0	0	2
20113AEC23	Mechanics And special theory of Relativity	6	1	0	4
20112AEC25A	ODE,PDE and Laplace Transform	5	0	0	4
20112AEC26A	Analytical Geometry in Vector Calculus	4	0	0	3
	PRACTICAL				
20113SEC24L	Mechanics Lab	0	0	3	2
	RESEARCH SKILL BASED COURSE				
20113RLC27	Research Led Seminar	-	-	-	1
	Total	**23**	**1**	**3**	**18**
	AUDIT COURSE				
201ACLSCOS	Communication Skills	-	-	-	2
201ACSSBBE	Basic Behavioral Etiquette	-	-	-	2

SEMESTER III

Course Code	Course Title	L	T	P	C
	SEMESTER I				
	THEORY				
20110AEC11 20111AEC11 20132AEC11 20135AEC11	Tamil-I Advanced English-I Hindi-I French-I	4	0	0	2
20111AEC12	English-I	4	0	0	2
20113AEC13	Properties of Matter	5	1	0	4
20112AEC15A	Calculus and Fourier series	4	-	0	4
20112AEC16A	Algebra and Trigonometry	4	-	0	3
	PRACTICAL				
20113SEC14L	Properties of Matter Lab	0	0	3	2
	Total	**21**	**1**	**3**	**17**
	AUDIT COURSE				
201ACLSICN	Indian Constitution	-	-	-	2
201ACLSUHV	Universal Human Values	-	-	-	2

SEMESTER IV

Course Code	Course Title	L	T	P	C
	THEORY				
20110AEC41 20111AEC41 20132AEC41 20135AEC41	Tamil-IV Advanced English-IV Hindi-IV French-IV	4	0	0	2
20111AEC42	English-IV	4	0	0	2
20113AEC43	Optics	5	0	0	4
20114AEC45	Chemistry-II	6	0	0	5
201ENVTSTU	Environmental Studies	2	0	0	2
	PRACTICAL				
20113SEC44L	Optics Lab	0	0	3	2
20114SEC46L	Volumetric Analysis Lab -II	0	0	3	2
	TOTAL	**21**	**0**	**3**	**19**
	AUDIT COURSE				
201ACLSLMS	Leadership and Management Skills	-	-	-	2
201ACSSAQA	General Aptitude and Quantitative Ability	-	-	-	2

SEMESTER V

Course Code	Course Title	L	T	P	C
	THEORY				
20113AEC51	Electricity and Magnetism	5	0	0	4
20113AEC52	Atomic Physics	4	1	0	3
20113AEC53	Basic Electronics	4	1	0	4
20113DSC56_	Discipline Specific Elective – I	5	0	0	3
	RESEARCH SKILL BASED COURSE				
20113BRC57	Participation in Bounded research	-	-	-	1
	PRACTICAL				
20113SEC54L	Electricity and Magnetism Lab	0	0	3	2
20113SEC55L	Basic Electronics Lab	0	0	3	2
	TOTAL	18	2	6	19
	AUDIT COURSE				
201ACLSPSL	Professional Skills	-	-	-	2

SEMESTER VI

Course Code	Course Title	L	T	P	C
	THEORY				
20113AEC61	Digital Electronics & Microprocessor	4	1	0	4
20113AEC62	Elements of Theoretical Physics	5	0	0	5
20113DSC65_	Discipline Specific Elective –II	5	0	0	3
201_OEC	Open Elective Course	4	0	0	2
	PRACTICAL				
20113SEC63L	Digital Electronics Lab	0	0	3	2
20113SEC64L	Microprocessor Lab	0	0	3	2
20113PRW66	Project Work	-	-	-	4
20113PEE	Programme Exit Examination	-	-	-	1
	TOTAL	18	1	6	23
	AUDIT COURSE				
201ACSSIST	Interview Skills Training and Mock Test	-	-	-	2
201ACLSCET	Community Engagement	-	-	-	1
	TOTAL CREDITS				**115**
	Total Credits – Audit Courses				**19**

Discipline Specific Electives

Semester	Discipline Specific Elective Courses -I
V	a) 20113DSC55A- Digital Photography b) 20113DSC55B- Laser Physics

Semester	Discipline Specific Elective Courses - II
VI	a) 20113DSC64A-Polymer Physics b) 20113DSC64B- Physics of Radiography

General Electives

Semester	General Elective Courses
V	a) 20111GEC-Journalism b) 20112GEC-Development of Mathematical Skills c) 20114GEC-Food and Adulteration d) 20117GEC-Mushroom Technology e) 20120GEC-Web Technology f) 20122GEC-E-Commerce and its Application g) 20161GEC-Indirect Taxes

Skill based Electives

Semester	Skill based Elective Courses
I	a) 20120SEC01AL-Package Lab – I b) 20160SEC01B-Soft skill – I
II	a) 20120SEC02AL-Package Lab – II b) 20160SEC02B-Soft skill – II
III	a) 20120SEC03AL-Package Lab –III b) 20160SEC03B-Soft skill – III
IV	a) 20120SEC04AL-Package Lab –IV b) 20160SEC04B- Soft skill – IV
V	a) 20120SEC05AL-Package Lab –V b) 20160SEC05B-Soft skill - V
VI	a) 20120SEC06AL-Package Lab –VI b) 20160SEC06B-Soft skill – VI

Credit Distribution

Sem	AEC	SEC	DSC	OEC	Research	NON CGP	Total
I	15	2	-	-	-	-	17
II	15	2	-	-	1	-	18
III	13	4	-	-	2	-	19
IV	13	4	-	-	-	2	19
V	11	4	3	-	1	-	19
VI	9	4	3	2	4	1	23
Total	**76**	**20**	**6**	**2**	**8**	**3**	**115**

M.Sc., PHYSICS

COURSE STRUCTURE

Course Code	Course Title	L	T	P	C
	SEMESTER I				
20213AEC11	Advanced Mathematical Physics	6	1	0	5
20213AEC12	Classical and Statistical Mechanics	6	1	0	5
20213AEC13	Electronics and Communication	6	1	0	4
20213SEC14L	Spectroscopy and General Electronics Lab	0	0	4	2
20213DSC15_	Discipline Specific Elective – I	5	0	0	4
20213RLC16	Research Led seminar	-	-	-	1
	Total	**23**	**3**	**4**	**21**
	SEMESTER II				
20213AEC21	Microprocessor and Microcontroller	5	1	0	5
20213AEC22	Quantum Mechanics	5	1	0	5
20213AEC23	Condensed Matter Physics	5	0	0	4
20213SEC24L	Advanced General Experiments Lab	0	0	4	2
20213DSC25_	Discipline Specific Elective – II	5	0	0	4
20213RMC26	Research Methodology	3	0	0	2
20213BRC27	Participation in Bounded Research	-	-	-	2
	Total	23	2	4	24
	SEMESTER III				
20213AEC31	Electro Magnetic Theory	6	1	0	6
20213AEC32	Nuclear and Particle Physics	6	1	0	6
20213SEC33L	Advanced Electronics Lab	0	0	5	3
20213DSC34_	Discipline Specific Elective – III	5	0	0	4
202__OEC35_	Open Elective	4	0	0	3
20213SRC36	Participation in Scaffold Research (Societal Project)	-	-	-	2
	Total	**21**	**2**	**5**	**24**
	SEMESTER IV				
20213AEC41	Laser Physics And Non Linear Optics	6	1	0	6
20213AEC42	Numerical Methods and Computational Physics	6	1	0	6
20213SEC43L	Numerical Methods Lab with C++ Programming	0	0	5	3
20213DSC44_	Discipline Specific Elective – IV	5	0	0	4
20213PRW45	Project Work	0	0	0	6
20213PEE	Programme Exit Examination	-	-	-	2
	Total	**17**	**2**	**5**	**27**
	Total Credits for the Programme				**96**

Discipline specific Electives

Semester	Discipline specific Elective Courses- I
I	a) 20213DSC15A - Computational Physics b)20213DSC15B- Crystal Growth Processes

Semester	Discipline specific Elective Courses -II
II	a) 20213DSC25A - Radiation Safety b)20213DSC25B- Renewable Energy

Semester	Discipline specific Elective Courses -III
III	a)20213DSC34A- Photonics Devices and Applications b)20213DSC34B- Analog Systems and Applications

Semester	Discipline specific Elective Courses -IV
IV	a)20213DSC43A- Elements of Modern Physics b)20213DSC43B- Non-linear Dynamics

General Electives

Semester	General Elective Courses
III	a) 20211GEC-Writing for the Media b) 20212GEC-Applicable Mathematics Techniques c) 20214GEC- Green Chemistry d) 20215GEC-Bio-analytical Techniques e) 20220GEC-Internet and Web Design f) 20261GEC- Insurance Services g) 20280GEC-Counselling Psychology

Credit Distribution:

Sem	AEC	SEC	DSC	OEC	Research	Others	Total
I	14	2	4	-	1	-	21
II	14	2	4	-	4	-	24
III	12	3	4	3	2	-	24
IV	12	3	4	-	6	2	27
Total	52	10	16	3	13	2	96

Course Code	Physics of Radiography
20113DSC65B	

Course Objectives:

- Study on x-ray production and its physics, different types of x-ray tube and x-ray generators.
- Learn about different image receptor systems like screen film radiography.
- Trained on Computed tomography and applications.
- Study on basic principles of ultrasound.
- Understand nuclear magnetic resonance and MRI

1. X-Ray Production, X-Ray Tubes and Generators: Discovery of X-rays, Production and properties of x-rays ,X-ray tubes, X-ray tube insert, tube housing, filtration and collimation, X-ray generator -function and components, -circuit design, Timers in radiography. Factors affecting x-ray emission Power rating and heat loading x-ray exposure rating charts. Nature of Cooling, Safety devices in X-ray tubes, Mammography - X-ray tube design, X-ray generator and phototimer system, compression scattered radiation and magnification, screen-film cassettes and film processing, Ancillary procedures, radiation dosimetry. **(16 hours)**

2. Screen-Film Radiography and Film Processing: Basic geometric principles of radiographic image, Latent image, screen-film system, construction and Characteristics, optical density, contrast, speed and latitude, Types of films, intensifying screens – construction and action, Types of screens-rare earth, Fluoroscopic, Film exposure, Radiographic grids, Film processing, Automatic Film Processing, artifacts, Processor QA, Contrast and dose in radiography, scattered radiation in projection Radiography, reduction of patient dose, patient dose measurement, dose level for diagnostic procedures, methods to reduce patient dose. Image Quality –Unsharpness, Spatial resolution, Contrast, contrast agents, Image Noise, Image distortion and artifacts, detective quantity efficiency, sampling and aliasing in digital images, contrast-detail curves

(16 hours)

3. Computed Tomography and Other X-ray techniques: Basic principles, Historical development, Detectors and detector arrays , Details of acquisition, Reconstruction algorithms, Radon Transform, Back Projection, Filtered Back projection, Iterative Reconstruction, ML-EM, Digital image display, scan motions, x-ray sources, collimation, X-ray detectors, viewing system, Radiation Dose, Image quality, Artifacts, Fluoroscopy, image intensification, Digital fluoroscopy, Automatic Brightness Control, Cine fluorography, Xeroradiography-. Digital Radiography- Thermography-Basic principles, scanning techniques, radiation dose to patients, Radiography of welds-casting and forgings, Microradiography, Autoradiography, Flash radiography, X-ray diffraction analysis. **(16 hours)**

4. Ultrasound: Basic principles, Characteristics of sound, nature and production of ultrasound, interaction of ultrasound with matter, Transducers and their design, Piezoelectric effect, frequency response of transducers, various types of transducers,

Ultrasound beam properties, Image data acquisition, Dynamic range, Different scan modes-A,B,M modes, Two-Dimensional image display and storage Real time scanning, Principles of Gray-scale imaging, significance of gain and gain compensation, pulse rate and its significance, Resolution and frequency, depth and frequency, Image quality, artifacts, Doppler techniques and principles of colour Doppler , System performance and QA, Acoustic power and biological effect of ultrasound **(16 hours)**

5. Nuclear Magnetic Resonance (NMR) and MRI: Magnetization properties, Generation and detection of magnetic resonance signals, Interaction of nuclei with a static magnetic field, Rotation and precession, Interaction of nuclei with radiofrequency wave, induction of a magnetic resonance signal in a coil, Quantum mechanical interpretation, Bulk magnetization, relaxation processes:T1 and T2, Relaxation times (T1 and T2) quality assurance, acceptance testing and commissioning of radiation system for biologic materials. Pulse sequences, spin echo, Inversion recovery, Gradient recalled echo, signal from flow, perfusion and diffusion contrast, Magnetization transfer contrast, Principles of MRI, Localization of MR signal, k-space data acquisition and image reconstruction, 3d Fourier transform image acquisition, image characteristics, angiography and magnetization transfer contrast, artifacts, instrumentation, safety and bioeffets. **(16 hours)**

Expected course outcomes:
- Able to explain x-ray production and its physics, different types of x-ray tubes and x-ray generators. - Able to handle different image receptor systems like screen film radiography, latent image formation, film processing, dark room and film characteristics.

STANDARD BOOKS FOR STUDY AND REFERENCES

1. Diagnostic radiology for teachers and students, IAEA Publication, *Pub1564*
2. N. Smith and A. Webb , Introduction to Medical Imaging Physics, Engineering and Clinical Applications 2011,Cambridge University Press
3. W.J. Meredith and J.B. Massey "Fundamental Physics of Radiology" John Wright and Sons, UK, 1989
4. Christensen 'Physics of Diagnostic Radiology' Lea and Febiger – Philadelphia (1990).
5. W.R. Hendee, "Medical Radiation Physics", Year Book – Medical Publishers Inc. London, 1981
6. P. Sprawls, Magnetic Resonance Imaging: Principles, Methods and Techniques, Medical Physics Publishing, Madison (2000)

Course Code	Elements of Modern Physics
20213DSC43A	

Objectives:

This course introduces modern development in physics. Starting from Planck's Law it develops the idea of probability interpretation and then discusses the formulation of Schrodinger equation. It also introduces basic concepts of Nuclear Physics.

Planck's quantum, Planck's constant and light as a collection of photons; Photo-electric effect and Compton scattering. De Broglie wavelength and matter waves; Davisson-Germer experiment. **(8 Lectures)**

Problems with Rutherford model- instability of atoms and observation of discrete atomic spectra; Bohr's quantization rule and atomic stability; calculation of energy levels for hydrogen like atoms and their spectra. **(6 Lectures)**

Position measurement- gamma ray microscope thought experiment; Wave-particle duality, Heisenberg uncertainty principle- impossibility of a particle following a trajectory; Estimating minimum energy of a confined particle using uncertainty principle; Energy-time uncertainty principle. **(6 Lectures)**

Two slit interference experiment with photons, atoms and particles; linear superposition principle as a consequence; Schrodinger equation for non-relativistic particles; Momentum and Energy operators; stationary states; physical interpretation of wavefunction, probabilities and normalization; Probability and probability current densities in one dimension. **(11 Lectures)**

One dimensional infinitely rigid box- energy eigenvalues and eigenfunctions, normalization; Quantum dot as an example; Quantum mechanical scattering and tunnelling in one dimension - across a step potential and across a rectangular potential barrier. **(12 Lectures)**

Size and structure of atomic nucleus and its relation with atomic weight; Impossibility of an electron being in the nucleus as a consequence of the uncertainty principle. Nature of nuclear force, NZ graph, semi-empirical mass formula & binding energy. **(6 Lectures)**

Radioactivity: stability of nucleus; Law of radioactive decay; Mean life and half-life; α decay; β decay - energy released, spectrum and Pauli's prediction of neutrino; γ-ray emission. **(11 Lectures)**

Reference Books:

- Concepts of Modern Physics, Arthur Beiser, 2009, McGraw-Hill
- Modern Physics, John R.Taylor, Chris D.Zafiratos, M.A.Dubson,2009, PHI Learning
- Six Ideas that Shaped Physics:Particle Behave like Waves, T.A.Moore, 2003, McGraw Hill

- Quantum Physics, Berkeley Physics Course,Vol.4. E.H. Wichman, 2008, Tata McGraw-Hill Co.
- Modern Physics, R.A. Serway, C.J. Moses, and C.A.Moyer, 2005, Cengage Learning
- Modern Physics, G.Kaur and G.R. Pickrell, 2014, McGraw Hill

Course Code	Renewable Energy
20213DSC25B	

COURSE OBJECTIVES

- This course envisages the new and renewable source of energy available in nature and to expose the students to sources of energy crisis and the alternates available.
- Stress on the application of non-conventional energy technologies.
- The objective of the programme is to provide specialist manpower to meet the challenges of the energy sector.
- Basic understanding about the managerial and soft skills required in an organization.
- Knowledge regarding internships and on the job training programs offered.
- Demonstrate ethical and socially responsible behaviour.

COURSE OUTCOME

- Understand the need of energy conversion and the various methods of energy storage.
- Knowledge of theoretical as well as the practical aspects of renewable energy technologies, energy conservation, and management.
- Make a meaningful participation in accelerating India's economy by gaining appropriate employment, becoming entrepreneurs and creating appropriate knowledge.

Module 1:

Fundamentals of Sustainable Energy & Development

Introduction to RE – Need of switching to Renewable Energy sources, Difference between Renewable & Non-renewable sources, Main sources – solar, wind, tidal, biomass, geothermal, Applications, Advantages & Disadvantages of Renewable Energy.

Module 2:

Units and Measurements, Circuit Theory and Electrical Fundamentals

Unit of a physical quantity - Standard unit, various system of units (CGS, MKS, SI, FPS), Conversions - Fundamental and derived physical quantities - Measurement of time – Length measurements - Introduction to circuits and Ohm's Law - Basic electric quantities – Voltage – Current - Introduction to LR circuit - RC circuit - LCR Circuit - Basic 3 Theorems/Circuit - Colour Code of resistors - Types of Resistors - Different Types of Switches.

Module 3:

Introduction to Solar Photovoltaics

Basics of Photovoltaics – Solar Energy, - Greenhouse effect - Properties of Light - Direct &

Diffused radiation - Sun - Terrestrial solar radiation, atmospheric effects - Semiconductors & Junctions – Semiconductor materials & structure, Intrinsic & Extrinsic, Bandgap – Doping - Absorption of light - Formation of PN junction - Solar cell operation – Structure, solar cell parameters, Resistive effects, Design of solar cells –Optical properties, ARC, Modules & Arrays –Interconnection of cells.-

Module 4:

Introduction to Wastewater Treatment

Chemical & Biological Properties of water – Chemical: pH, TDS, Cat ions/ An ions, Hardness, Salinity, Alkalinity. Biological properties – DO, BOD, COD, and Bacterial count - Waste Water Treatment – Primary & Secondary treatment, Methods used for primary treatment, Secondary treatment methods – Biological treatment, activated sludge, trickling filters, oxidation ponds.

Module 5:

Introduction to PV Module Installation

Solar Cells and PV modules: Solar cell types-Equivalent circuit diagrams of solar cells – Spectral sensitivity -Efficiency of solar cells - PV modules-Types of modules. Module cable outlets and junction boxes -Wiring symbols. Solar panels and array - Inverters & Cables: PV array combiner/junction boxes, string diodes and fuses. Basics of Site Surveys and Shading Analysis, Basics of Planning and Sizing Grid.

REFERENCES

1. Non-conventional Energy Sources; G.D.Rai; 2011; Fifth Edition, Khanna Publishers

2. Fundamentals of Physics; David Halliday& Robert Resnick; 2010; John Wiley & Sons

3. Planning and installing photovoltaic systems-A guide for installers, architects and engineers; The German Energy Society; 2008; Second Edition; Earthscan, UK.

4. Physicochemical processes for water quality control, Weber, W.J., John Wiley and sons, New York, 1983

5. Principles of Electronics; V. K. Mehta; 2006; Tenth Edition; S. Chand & Co.

6. Set Theory and Related Topics, LipSchutz, Schaum Outline Series, 2009, 2nd Edition, Tata McGraw Hill Publishing Company, New Delhi.

7. Introduction to Computers-Alexis Leon and Mathews Leon.

Course Code	Analog Systems and Applications
20213DSC34B	

Course Objectives:

- The objectives of this subject are to Learn Fundamentals of electronic devices.
- Design and Applications of electronic circuits.
- Learn through practice mode the fundamental electronic devices

Module I

Semiconductor Diodes :

P and N type semiconductors. Energy Level Diagram. Conductivity and Mobility, Concept of Drift velocity. PN Junction Fabrication (Simple Idea). Barrier Formation in PN Junction Diode. Static and Dynamic Resistance. Current Flow Mechanism in Forward and Reverse Biased Diode. Drift Velocity. Derivation of Barrier Potential, Barrier Width and Current for Step Junction. Current Flow Mechanism in Forward and Reverse Biased Diode.

Module I I

Two-terminal Devices and their Applications:

(1) Rectifier Diode: Half-wave Rectifiers. Centre-tapped and Bridge Full-wave Rectifiers, Calculation of Ripple Factor and Rectification Efficiency, C-filter Diode and Voltage Regulation. Principle and structure of (1) LEDs, (2) Photodiode and (3) Solar Cell.

Module I I I

Bipolar Junction transistors:

n-p-n and p-n-p Transistors. Characteristics of CB, CE and CC Configurations. Current gains α and β Relations between α and β. Load Line analysis of Transistors. DC Load line and Q- point. Physical Mechanism of Current Flow. Active, Cut-off and

Saturation Regions.

Module IV

Amplifier:

Transistor Biasing and Stabilization Circuits. Fixed Bias and Voltage Divider Bias. Transistor as 2-port Network. h-parameter Equivalent Circuit. Analysis single-stage CE amplifier using Hybrid Model. Input and Output Impedance. Current, Voltage and Power Gains. Classification of Class A, B & C Amplifier .

Module V

Coupled Amplifier :

Two stage RC-coupled amplifier and its frequency response

Feedback in Amplifier:

Effects of Positive and Negative, Feedback on Input, Impedance, Output Impedance, Gain, Stability, Distortion and Noise.

Expected course outcomes:
Upon successful completion of this course, students will be able to: • Student identifies the relationship and correct usage of work, energy, heat capacity, specific heat, latent heat, and enthalpy. • Understand Semiconductor diodes, bipolar junction transistor. • Sketch, explain and design the amplifier circuit for given specification and analyze them discussoscillator principles, and frequency stability. • Analyze the dixerent types of Oscillators

Reference Books:

1. Electronics: Fundamentals and Applications, J.D. Ryder, 2004, Prentice Hall.

2. Solid State Electronic Devices, B.G.Streetman & S.K.Banerjee, 6th Edn.,2009, PHI Learning

3. Electronic Devices & circuits, S.Salivahanan & N.S.Kumar, 3rd Ed., 2012, Tata Mc-Graw Hill

4. OP-Amps and Linear Integrated Circuit, R. A. Gayakwad, 4th edition, 2000, Prentice Hall

5. Microelectronic circuits, A.S. Sedra, K.C. Smith, A.N. Chandorkar, 2014, 6th Edn., Oxford University Press.

6. Electronic circuits: Handbook of design & applications, U.Tietze, C.Schenk,2008, Springer

7. Semiconductor Devices: Physics and Technology, S.M. Sze, 2nd Ed., 2002, Wiley India

8. Microelectronic Circuits, M.H. Rashid, 2nd Edition, Cengage Learning

9. Electronic Devices, 7/e Thomas L. Floyd, 2008, Pearson India

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Department of Physics

Subject Code	Subject Name
20513TF	Certificate course on Thin film techniques

Total : 45 hours

Syllabus

Course Objectives:

The main objectives of this course are to:

1. To make the students understand the technique to prepare a nano thin films and device.
2. To bring exposure to various tools and equipment used for thin films characterizations

Unit 1- Introduction

Basic of Thin films and Nanostructures, Role of thin films in devices

Unit 2- FABRICATION OF THIN FILMS

Sol-gel synthesis, Spin coating, Chemical vapor deposition, Physical vapor deposition, Sputtering deposition, ion implantation, Cathodic arc deposition, Pulsed laser deposition, Molecular beam epitaxy

Unit 3- CHARACTERIZATION OF THIN FILMS

x-ray diffraction, UV-vis spectroscopy, squid, four probe resistivity, atomic probe microscopy, profilometer

Unit 4- PROPERTIES OF THIN FILMS

Structural, electrical, magnetic, optical, thermal, etc.

Unit 5- APPLICATION OF THIN FILMS

Application of thin films in different areas such as electronics, medical, defense, sports, automobiles, etc.

Course Outcomes

After learning the course the students should be able to:

1.To notify the learner about the various techniques of nano-thin films.

2. To know about the growth of nanostructured thin films.

3. To have knowledge about synthesis of nanostructured thin films

References

1. G. Cao, "Nanostructures & Nanomaterials: Synthesis, Properties & Applications" Imperial College Press, 2004.
2. W.T.S. Huck, "Nanoscale Assembly: Chemical Techniques (Nanostructure Science and Technology)".
3. Thin Film Phenomena by K. L. Chopra, McGraw Hill 1969.

Subject Code	Subject Name
20513CEC	Certificate course on communication electronic circuits

Total : 45 hours

Syllabus

Course Objectives:
The main objectives of this course are to:

- To comprehend the transmission of electromagnetic waves thorough different types of antenna and also to acquire knowledge about the propagation of waves through earth's atmosphere and along the surface of the earth
- To gain knowledge in the generation and propagation of microwaves
- To acquire knowledge about radar systems and its applications and also the working principle of colour television
- To learn the working principle of fiber optics and its use in telecommunication
- To understand the general theory and operation of satellite communication systems

UNIT – I: ANTENNAS AND WAVE PROPAGATION

Radiation field and radiation resistance of short dipole antenna-grounded antenna-ungrounded antenna-antenna arrays-broadside and end side arrays-antenna gain-directional high frequency antennas-sky wave-ionosphere- Eccles and Larmor theory- Magneto ionic theory-ground wave propagation

UNIT – II: MICROWAVES

Microwave generation—multi cavity Klystron-reflex klystron-magnetron travelling wave tubes (TWT) and other microwave tubes-MASER-Gunn diode-wave guides-rectangular wave guides-standing wave indicator and standing wave ratio(SWR)

UNIT – III: RADAR AND TELEVISION

Elements of a radar system-radar equation-radar performance Factors radar transmitting systems-radar antennas-duplexers-radar receivers and indicators-pulsed systems-other radar systems- colour TV transmission and reception-colour mixing principle-colour picture tubes-Delta gun picture tube-PIL colour picture tube-cable TV, CCTV and theatre TV

UNIT – IV: FIBER OPTIC COMMUNICATION

Propagation of light in an optical fibre-acceptance angle-numerical aperture-step and

graded index fibres-optical fibres as a cylindrical wave guide-wave guide equations-wave guide equations in step index fibres - fibre losses and dispersion-applications

UNIT – V: SATELLITE COMMUNICATION

Orbital satellites-geostationary satellites-orbital patterns-satellite system link models-satellite system parameters-satellite system link equation link budget-INSAT communication satellites

Course Outcomes

After learning the course the students should be able to:

1. Discuss and compare the propagation of electromagnetic waves through sky and on earth's surface Evaluate the energy and power radiated by the different types of antenna
2. Compare and differentiate the methods of generation of microwaves analyze the propagation of microwaves through wave guides- discuss and compare the different methods of generation of microwaves
3. Classify and compare the working of different radar systems- apply the principle of radar in detecting locating, tracking, and recognizing objects of various kinds at considerable distances – discuss the importance of radar in military- elaborate and compare the working of different picture tube
4. Classify, discuss and compare the different types of optical fiber and also to justify the need of it-discover the use of optical fiber as wave guide
5. Explain the importance of satellite communication in our daily life-distinguish between orbital and geostationary satellites elaborate the linking of satellites with ground station on the earth

References

1. Electronic communications – Dennis Roody and Coolen, Prentice Hall of India, IV edition, 1995.
2. Wayne Tomasi, Advanced electronics communication systems, fourth edition, Prentice Hall of India, 1998
3. Dennis Roddy and Coolen, 1995, *Electronics communications*. Prentice Hall of India IV Edition.
4. Wayne Tomasi, 1998 *"Advanced Electronics communication System"* 4th edition, Prentice Hall of India, 1998
5. S. Salivahanan, N. Suersh Kumar & A. Vallavaraj, 2009, Electronic Devices and Circuits, Tata McGraw-Hill Publishing Company Limited, New Delhi, Second Edition.

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Department of Physics

Subject Code	Subject Name
20513FO	Certificate course on fiber optics

Total : 45 hours

Syllabus

COURSE OBJECTIVES:

1. To realize the significance of optical fiber communications.
2. To understand the construction and characteristics of optical fiber cable.
3. To develop the knowledge of optical signal sources and power launching.
4. To identify and understand the operation of various optical detectors.
5. To under the design of optical systems and WDM.

Unit 1- Introduction

Need for optical communication, salient features of optical fibers, ray theory of light guidance, numerical aperture, modes of a fiber, single and multimode fibers, step-index and graded-index fibers.

Transmission characteristics of optical fibers, attenuation, pulse broadening mechanism, intermodal dispersion, bit rate - length product, material dispersion.

Unit 2- Basic Optical Communications Concepts

P2P System, Transmitter, Light Source, LED, Laser Diode, Detector, PIN diode, Avalanche Photo Diode, Optical Amplifiers, EDFA, PDFA, Regeneration, ADM, OADM, Digital Cross Connect, RPR Ring.

Unit 3- Optical Fiber

Core, Cladding, Primary Buffer, Types of Fibers, Silica Core Silica Cladding, Silica Core, Plastic Cladding (PCS), Plastic Core Plastic Cladding (POF), fiber fabrication techniques.

Unit 4- Cable Splicing

Fusion Splicing, Mechanical Splicing, Single Fiber Fusion Splicing, Mass Fusion Splicing, Stages

of Splicing, Splicing Precautions, Misalignment, End Gap, End Angle, NA Mismatch, Core Mismatch, Waisting, Bulging, Axial Run-out, Bubble, Incomplete Fusion

Unit 5- Testing of Cables

Continuity Test, Light Source- Power Meter, OLTS, Visual Fault Locator, OTDR Testing, Measuring Cable Span, Attenuation Coefficient, Connector/ Splice Loss Measurement, Distance to Fault, OTDR Trace Analysis, Optical Loss Budget.

TEXT BOOKS:

1.Optical Fiber Communications – Gerd Keiser, Tata Mc Graw-Hill International edition, 4th Edition, 2008.

2. Optical Fiber Communications – John M. Senior, PHI, 2nd Edition, 2002. REFERENCE BOOKS:

1. Fiber Optic Communications – D.K. Mynbaev , S.C. Gupta and Lowell L. Scheiner, Pearson Education, 2005.

2. Text Book on Optical Fibre Communication and its Applications – S.C.Gupta, PHI, 2005. 3. Fiber Optic Communication Systems – Govind P. Agarwal , John Wiley, 3rd Edition, 2004.

4. Fiber Optic Communications – Joseph C. Palais, 4th Edition, Pearson Education, 2004.

COURSE OUTCOMES:

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

1. Understand and analyze the constructional parameters of optical fibers.
2. Be able to design the optical system.
3. Estimate the losses due to attenuation, absorption, scattering and bending.
4. Compare various optical detectors and choose suitable one for different applications.

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SCHOOL OF ARTS AND SCIENCE
DEPARTMENT OF COMPUTER SCIENCE
MINUTES OF THE BOARD OF STUDIES MEETING 2021-2022

The Meeting of the Board of studies for the Department of Computer Science was held on 12.04.21 at 10.30 am under the chairmanship of Dr.K.T.Senthil Kumar, All the staff members are requested to attend the meeting.

The following members were present:

1. Dr.L.Chinnappa - Dean of Arts and Science, PRIST Deemed University
2. Dr.K.T.Senthil Kumar - HOD/Asst.prof / (Chairman), PRIST Deemed University
3. Dr.K.Saravanan - Prof. PRIST Deemed University, Member Internal
4. Dr.A.V.Seethalakshmi - Prof. PRIST Deemed University, Member Internal
5. Dr.R.Maruthi - Prof. PRIST Deemed University, Member Internal
6. Dr.G.Preethi - Asso.prof. PRIST Deemed University, Member Internal
7. G.Gayathri - Asst.prof, PRIST Deemed University, Member Internal
8. P.Karthik - Asst.prof, PRIST Deemed University, Member Internal
9. Dr.K.Rajiv Gandhi - Member External
   Prof. Alagappa University,
   Dept of Computer Science
   Karaikudi.
10. Mr. S.Ganapathy -Member External
    Associate Software Engineer,
    Sterling Software,
    Chennai.
11. T. Siva -B.C.A Alumni
12. S. Sanjay -B.Sc.(CS) Student

The Chairman of Board of Studies (BOS) in Computer Science welcomed the members and briefed about the programmes offered by the department and the existing Syllabi for B.Sc. Computer Science, M.Sc. Computer Science, M.Phil. Computer Science, BCA and MCA programmes with effect from 2021-2022.

Also the Board has decided to continue the existing syllabi for M.Phil. Programme for 2021-2022

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Dean of Arts & Science
PRIST Deemed to be University
Thanjavur - 613 403, Tamilnadu.

The new courses are introduced in the Academic year 2021-2022.

Course Code	Category(Core: Theory/Practical)	Programme	Year of introduction
20122DSC54C	Computer Graphics	BCA	2021
20122DSC63C	Fundamentals of Digital Computers	BCA	2021
20120DSC54D	Introduction to Software Engineering	B.sc CS	2021
20120DSC63D	System Programming	B.sc CS	2021
20222DSC17C	Distributed Systems	MCA	2021

The New Value Added Diploma and Certificate Courses were introduced in the Academic year 2021-2022.

Name of the course/programme	Course/programme Code	Year of offering
Diploma in Web Application development and hosting	21DPWP123	2021
Diversity in Python Programming	21CCPY01	2021
Certificate Course On Digital Marketing	21CCDM02	2021
Certificate Course On Data Analysis Using Ms-Excel	21CCDAM03	2021

The Chairman of Board of Studies thanked all the members for their kind cooperation and the meeting came to an end.

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Dean of Academic Affairs
PRIST Deemed to be University
Thanjavur - 613 403, Tamilnadu.

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SCHOOL OF ARTS AND SCIENCE

DEPARTMENT OF COMPUTER SCIENCE

(BACHELOR OF COMPUTER APPLICATION)

REGULATION 2021– 2022

COURSE STRUCTURE

SEMESTER I

Course Code	Course Title	L	T	P	C
	THEORY				
20110AEC11/ 20111AEC11/ 20132AEC11/ 20135AEC11	Tami – I/Advanced English-I/Hindi-I/ French – I	4	0	0	2
20111AEC12	English-I	4	0	0	2
20122SEC13	Programming in C with C++	5	1	0	4
20112AEC14B	Classical algebra	4	1	0	3
20112AEC15B	Numerical and statistical Methods	4	1	0	4
	PRACTICAL				
20122SEC16L	Programming in C with C++ Lab	0	0	3	2
	Total	**21**	**3**	**3**	**17**
	AUDIT COURSE				
201LSCIC	Indian Constitution	-	-	-	**2**
201LSCUV	Universal Human Values	-	-	-	**2**

SEMESTER–II

Course Code	Course Title	L	T	P	C
	THEORY				
20110AEC21/ 20111AEC21/ 20132AEC21/ 20135AEC21	Tamil – II/ Advanced English-II/Hindi-II/ French – II	4	0	0	2
20111AEC22	English-II	4	0	0	2
20122SEC23	Data Structure and Algorithms	5	1	0	4
20112AEC24B	Discrete Mathematics	4	1	0	4
20112AEC25B	Operations Research	4	1	0	3
	PRACTICAL				
20122SEC26L	Data Structure and Algorithms Lab	0	0	3	2
	RESEARCH SKILL BASED COURSE				
20122RLC27	Research Led Seminar	-	-	-	1
	Total	**21**	**3**	**3**	**18**
	AUDIT COURSES				
201LSCCS	Communication Skills	-	-	-	2
201SSCBE	Basic Behavioral Etiquette	-	-	-	2

SEMESTER –III

Course Code	Course Title	L	T	P	C
	THEORY				
20110AEC31/ 20132AEC31/ 20111AEC31/ 20135AEC31	Tamil – III/Hindi-III/Advanced English-III/ French – III	4	0	0	2
20111AEC32	English-III	4	0	0	2
20122SEC33	Internet and Java Programming	4	1	0	4
20161SEC34	Financial Accounting	4	1	0	4
20113AEC35A	Allied Physics –I	3	1	0	3
	PRACTICAL				
20122SEC36L	Internet and Java Programming Lab	0	0	3	2
	RESEARCH SKILL BASED COURSE				
20120RMC37	Research Methodology	2	0	0	2
	Total	**21**	**3**	**3**	**19**
	AUDIT COURSE				
201ACLSOAN	Office Automation	-	-	-	**2**

SEMESTER–IV

Course Code	Course Title	L	T	P	C
	THEORY				
20110AEC41/ 20111AEC41/ 20132AEC41/ 19135AEC41	Tamil-IV/Advanced English-IV /Hindi-IV/ French – IV	4	0	0	2
20111AEC42	English-IV	4	0	0	2
20122SEC43	Visual Programming	4	1	0	4
20113AEC44A	Allied Physics –II	5	1	0	5
201ENSTU45	Environmental Studies	2	0	0	2
	PRACTICAL				
20122SEC46L	Visual Programming Lab	0	0	3	2
20113AEC47AL	Allied Physics Lab –I	0	0	3	2
	Total	19	2	6	19
	AUDIT COURSE				
201LSCLS	Leadership and Management Skills	-	-	-	2
201SSCAQ	General Aptitude and Quantitative Ability				2

SEMESTER – V

Course Code	Course Title	L	T	P	C
	THEORY				
20122SEC51	Relational Database Management Systems	4	1	0	4
20122SEC52	.NET Programming	4	1	0	3
20122SEC53	Designing and supporting Computer Networks	4	1	0	4
20122DSC54_	Discipline Specific Elective -I	4	1	0	3
	PRACTICAL				
20122SEC55L	Oracle Lab	0	0	3	2
20122SEC56L	.NET Programming Lab	0	0	3	2
	RESEARCH SKILL BASED COURSE				
20122BRC57	Participation in Bounded Research	-	-	-	1
	Total	16	4	6	19
	AUDIT COURSE				
201ACLSPSL	Professional Skills	-	-	-	2

SEMESTER–VI

Course Code	Course Title	L	T	P	C
	THEORY				
20122SEC61	Advanced Web Technology	4	1	0	4
20122SEC62	Operating System	4	1	0	5
20122DSC63_	Discipline Specific Elective –II	4	1	0	3
201__OEC(2 Digit Course Name)	Open Elective	4	0	0	2
	PRACTICAL				
20122SEC64L	Advanced Web Technology Lab	0	0	3	2
20122SEC65L	Operating System Lab	0	0	3	2
20122PRW66	Project Work	-	-	-	4
20122PROEE	Program Exit Examination	-	-	-	1
	Total	16	3	6	23
	AUDIT COURSE				
20ISSCIM	Interview Skills Training and Mock Test	-	-	-	2
20ILSCCE	Community Engagement	-	-	-	1
Total Credits –Programme					115
Total Credits - Audit Courses					19

Discipline Specific Electives

Semester	Discipline Specific Elective Courses
V	a) 20122DSC54A- Computer Organization and Architecture b) 20122DSC54B - E-learning c) 20122DSC54C – Computer Graphics
VI	a) 20122DSC63A- Software Project Management b) 20122DSC63B - Object Oriented Analysis and Design c) 20122DSC63C – Fundamentals of Digital Computers

Open Elective

Semester	Open Elective Courses
VI	a) 201TAOEC-Tamil IlakkiyaVaralaru b) 201ENOEC- Journalism c) 201MAOEC-Development of Mathematical Skills d) 201PHOEC-Instrumentation e) 201CHOEC-Food and Adulteration f) 201MBOEC-Wildlife Conservation g) 201CSOEC-E-Learning h) 201CMOEC-Banking Service
Semester	Open Elective Courses
VI	a) 201TAOEC-Tamil IlakkiyaVaralaru b) 201ENOEC- Journalism c) 201MAOEC-Development of Mathematical Skills d) 201PHOEC-Instrumentation e) 201CHOEC-Food and Adulteration f) 201MBOEC-Wildlife Conservation g) 201CSOEC-E-Learning h) 201CMOEC-Banking Service

Credit Distribution

Sem	AEC	SEC	DSC	OEC	Research	Others	Total
I	11	6	-	-	-	-	17
II	11	6	-	-	1	-	18
III	7	10	-	-	2	-	19
IV	11	6	-	-	-	2	19
V		15	3	-	1	-	19
VI		13	3	2	4	1	23
TOTAL	44	52	6	2	8	3	115

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DEPARTMENT OF COMPUTER SCIENCE
B.Sc., COMPUTER SCIENCE- REGULATION 2021

COURSE STRUCTURE

SEMESTER – I

Course Code	Course Title	L	T	P	C
	THEORY				
20110AEC11/ 20111AEC11/ 20132AEC11/ 20135AEC11	Tami – I/Advanced English-I/Hindi-I/ French – I	4	0	0	2
20111AEC12	English-I	4	0	0	2
20120SEC13	Programming in C with C++	5	1	0	4
20112AEC14B	Classical algebra	4	1	0	3
20112AEC15B	Numerical and statistical Methods	4	1	0	4
	PRACTICAL				
20120SEC16L	Programming in C with C++ Lab	0	0	3	2
	Total	21	3	3	17
	AUDIT COURSE				
201LSCIC	Indian Constitution	-	-	-	2
201LSCUV	Universal Human Values	-	-	-	2

SEMESTER – II

Course Code	Course Title	L	T	P	C
	THEORY				
20110AEC21/ 20111AEC21/ 20132AEC21/ 20135AEC21	Tamil – II/ Advanced English-II/Hindi-II/ French – II	4	0	0	2
20111AEC22	English-II	4	0	0	2
20120SEC23	Internet and Java Programming	5	1	0	4
20112AEC24B	Discrete Mathematics	4	1	0	4
20112AEC25B	Operations Research	4	1	0	3
	PRACTICAL				
20120SEC26L	Internet and Java Programming Lab	0	0	3	2
	RESEARCH SKILL BASED COURSE				
20120RLC27	Research Led Seminar	-	-	-	1
	Total	21	3	3	18
	AUDIT COURSES				
201LSCCS	Communication Skills	-	-	-	2
201SSCBE	Basic Behavioral Etiquette	-	-	-	2

SEMESTER – III

Course Code	Course Title	L	T	P	C
	THEORY				
20110AEC31/ 20132AEC31/ 20111AEC31/ 20135AEC31	Tamil – III/Hindi-III/Advanced English-III/ French – III	4	0	0	2
20111AEC32	English-III	4	0	0	2
20120SEC33	Visual Programming	4	1	0	4
20113AEC34A	Applied Physics –I	4	1	0	5
	PRACTICAL				
20120SEC35L	Visual Programming Lab	0	0	3	2
20113AEC36AL	Applied physics Lab – I	0	0	3	2
	RESEARCH SKILL BASED COURSE				
20120RMC37	Research Methodology	2	0	0	2
	Total	**18**	**2**	**6**	**19**
	AUDIT COURSE				
201LSCOAN	Office Automation	-	-	-	**2**

SEMESTER – IV

Course Code	Course Title	L	T	P	C
	THEORY				
20110AEC41/ 20111AEC41/ 20132AEC41/ 20135AEC41	Tamil-IV/Advanced English-IV /Hindi-IV/ French – IV	4	0	0	2
20111AEC42	English-IV	4	0	0	2
20120SEC43	Active Server Programming	4	1	0	4
20113AEC44A	Applied Physics –II	5	1	0	5
201ENSTU45	Environmental Studies	2	0	0	2
	PRACTICAL				
20120SEC46L	Active Server Programming Lab	0	0	3	2
20113AEC47AL	Applied Physics Lab –II	0	0	3	2
	Total	19	2	6	19
	AUDIT COURSE				
201ACLSLMS	Leadership and Management Skills	-	-	-	2
201ACSSAQA	General Aptitude and Quantitative Ability				2

SEMESTER – V

Course Code	Course Title	L	T	P	C
	THEORY				
20120SEC51	Data Communication and Networking	4	1	0	4
20120SEC52	Operating System	4	1	0	3
20120SEC53	Microprocessor and its Applications	4	1	0	4
20120DSC54	Discipline Specific Elective -I	4	1	0	3
	PRACTICAL				
20120SEC55L	Microprocessor Lab	0	0	3	2
20120SEC56L	Operating System Lab	0	0	3	2
	RESEARCH SKILL BASED COURSE				
20120BRC57	Participation in Bounded Research	-	-	-	1
	Total	16	4	6	19
	AUDIT COURSE				
201ACLSPSL	Professional Skills	-	-	-	2

SEMESTER – VI

Course Code	Course Title	L	T	P	C
	THEORY				
20120SEC61	.NET Programming	4	1	0	4
20120SEC62	Relational Data Base Management System	4	1	0	5
20120DSC63_	Discipline Specific Elective –II	4	1	0	3
201__OEC (2 Digit Course Name)	Open Elective	4	0	0	2
	PRACTICAL				
20120SEC64L	.NET Programming Lab	0	0	3	2
20120SEC65L	Oracle Lab	0	0	3	2
20120PRW66	Project Work	-	-	-	4
20120PROEE	Program Exit Examination	-	-	-	1
	Total	**16**	**3**	**6**	**23**
	AUDIT COURSE				
201SSCIM	Interview Skills Training and Mock Test	-	-	-	2
201LSCCE	Community Engagement	-	-	-	1
Total Credits –Programme					**115**
Total Credits - Audit Courses					**19**

Discipline Specific Electives

Semester	Discipline Specific Elective Courses
V	a) 20120DSC54A- Cloud Computing b) 20120DSC54B- Middleware Technology c) 20120DSC54C- Enterprise Resource Planning d) 20120DSC54D-Introduction to Software Engineering
VI	a) 20120DSC63A- Data Mining b) 20120DSC63B-Artificial Intelligence and Expert System c) 20120DSC63C-Ethical Hacking d) 20120DSC63D -System Programming

Open Electives

Semester	Open Elective Courses
VI	a) 201TAOEC-Tamil IlakkiyaVaralaru b) 201MAOEC-Development of Mathematical Skills c) 201PHOEC-Instrumentation d) 201CHOEC-Food and Adulteration e) 201MBOEC-Wildlife Conservation f) 201CSOEC-Web Technology g) 201CMOEC-Banking Service

Credit Distribution

Sem	AEC	SEC	DSC	OEC	Research	Others	Total
I	11	6	-	-	-	-	17
II	11	6	-	-	1	-	18
III	7	10	-	-	2	-	19
IV	11	6	-	-	-	2	19
V		15	3	-	1	-	19
VI		13	3	2	4	1	23
TOTAL	**44**	**52**	**6**	**2**	**8**	**3**	**115**

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SCHOOL OFARTSANDSCIENCE

DEPARTMENT OF COMPUTER

SCIENCE(MASTER OF COMPUTER

APPLICATION)

REGULATION 2021– 2022

COURSE

STRUCTURE

SEMESTER-I

Course Code	Course Title	L	T	P	C
20222SEC11	J2EE Programming	4	0	0	4
20222SEC12	Relational Data Base Management System.	4	0	0	4
20222SEC13	Routing and Switching in LAN	4	0	0	4
20212SEC14	Discrete Mathematics	4	0	0	4
20222DSC17	Discipline Specific Elective – I	4	0	0	4

Semester II

Course Code	Course Title	L	T	P	C
20222SEC21	Python Programming	4	0	0	4
20222SEC22	Cryptography Network security	4	1	0	3
20222SEC23	Open Source programming	4	0	0	3
20222SEC24	Web Service	4	0	0	3
20222SEC25L	Python Programming Lab	0	0	3	2
20222SEC26L	Open Source programming Lab	0	0	3	2
20222DSC27_	Discipline Specific Elective – II	5	0	0	4
20222RMC28	Research Methodology	3	0	0	2
20222BRC29	Participation in Bounded Research	0	0	0	2
	Total	**24**	**1**	**6**	**25**

Semester III

Course Code	Course Title	L	T	P	C
20222SEC31	Data mining and warehousing	6	1	0	5
20222SEC32	Grid and Cloud Computing	6	1	0	4
20222SEC33	.NET Programming	5	0	0	4
20222SEC34	Object Oriented System Design	5	0	0	4
20222SEC35L	.NET Programming Lab	0	0	3	2
20222DSC36_	Discipline Specific Elective – III	5	0	0	4
20222SRC37	Societal project (Mini Project)	0	0	0	2
	Total	**25**	**2**	**3**	**25**

Semester IV

Course Code	Course Title	L	T	P	C
20222SEC41	Human Computer Interaction	6	0	0	4
20222SEC42	Software Project Management	6	0	0	4
20222SEC43	Big Data	6	0	0	5
20222PRW44	Project work	0	0	15	10
20222PEE	Program Exit Examination	-	-	-	2
	Total	5	0	26	**25**
	Total Credits of the Programme				**100**

DISCIPLINE SPECIFIC ELECTIVE COURSES:

Semester	Discipline Specific Elective Courses
I	a) 20222DSC17A - Mobile Computing b) 20222DSC17B - Knowledge based decision support system c) 20222DSC17C- Distributed Systems
II	a) 20222DSC27A - Game Programming b) 20222DSC27B - Multimedia and Graphics c) 20222DSC27C - Middleware Technology
III	a) 20222 DSC 36A - Information Security b) 20222 DSC36B - Internet of Things c) 20222DSC36C - M-Marketing

Credit Distribution:

Sem	AEC	SEC	DSC	OEC	Research	Others	Total
I	4	16	4		1		25
II		17	4		4		25
III		19	4		2		25
IV		13			10	2	25
TOTAL	4	65	12		17	2	100

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SCHOOL OF ARTS AND SCIENCE

DEPARTMENT OF COMPUTER SCIENCE

M.sc Computer Science

REGULATION 2021– 2022

COURSE

STRUCTURE

SEMESTER-I

Course Code	Course Title	L	T	P	C
	Semester I				
20220SEC11	J2EE Programming	6	0	0	4
2020SEC12	RDBMS	6	0	0	4
20212SEC13	Discrete Mathematics	6	0	0	4
20220SEC14L	J2EE programming Lab	0	0	3	2
20220SEC15L	RDBMS Lab	0	0	3	2
20220DSC16_	Discipline Specific Elective - I	6	0	0	4
20220RLC17	Research Led Seminar	-	-	-	1
	Total	**24**	**0**	**6**	**21**

Semester II

Course Code	Course Title	L	T	P	C
20220SEC21	Python Programming	5	0	0	4
20220SEC22	Cryptography & Network Security	5	0	0	4
20220SEC23	Software Engineering	5	0	0	4
20220SEC24L	Python Programming Lab	0	0	3	2
20220SEC25L	UNIX Lab	0	0	3	2
20220DSC26_	Discipline Specific Elective – II	5	0	0	4
20220RMC27	Research Methodology	4	0	0	2
20220BRC28	Participation in Bounded Research	-	-	-	2
	Total	**24**	**0**	**6**	**24**

Semester III

Course Code	Course Title	L	T	P	C
20220SEC31	Open Source programming	6	0	0	6
20220SEC32	.Net Programming	6	0	0	5
20220SEC33L	Open Source programming Lab	0	0	3	2
20220SEC34L	.Net Programming Lab	0	0	3	2
20220DSC35_	Discipline Specific Elective – III	5	0	0	4
202__OEC	Open Elective Course	4	0	0	3
20220SRC37	Societal project (Mini Project)	0	0	0	2
	Total	**21**	**0**	**6**	**24**

Semester IV

Course Code	Course Title	L	T	P	C
20220SEC41	Software Testing	6	0	0	6
20220SEC42	Human Computer Interaction	6	0	0	5
20220DSC43_	Discipline Specific Elective - IV	4	0	0	4
20220PRW44	Project work	0	0	0	10
20220PEE	Programme Exit Examination	-	-	-	2
	Total	14	0	0	27
	Total credits for the program				**96**

Discipline Specific Electives

Semester	Discipline Specific Elective Courses
I	a) 20220DSC16A - WAP and XML b) 20220DSC16B - Advanced Computer Architecture
II	a) 20220DSC26A - Artificial Intelligence b) 20220DSC26B - Distributed Operating System
III	a) 20220DSC35A - Real Time Operating Systems b)20220DSC35B - Wireless Communication Network
IV	a) 20220DSC43A - Multimedia and its application b) 20220DSC43B - Middleware Technology

Open Electives

Semester	Open Elective Courses
III	a) 2012ENOEC – Writing for the Media b) 202MAOEC-Applicable Mathematics Techniques c) 202PHOEC-Bio-medical Instrumentation d) 202CHOEC-Green Chemistry e) 202BCOEC-Herbal Medicines f) 202CMOEC- Financial Service g) 20280OEC-Counselling and Psychology

CREDIT DISTRIBUTION

SEMESTER	AEC	SEC	DSC	OEC	RESEARCH	OTHERS	TOTAL
I	4	12	4		1		21
II		16	4		4		24
III		15	4	3	2		24
IV		11	4		10	2	27
TOTAL	**4**	**59**	**12**	**2**	**15**	**2**	**96**

SCHOOL OF ARTS & SCIENCE

DEPARTMENT OF COMPUTER SCIENCE

New courses-2021-22

B.C.A

Course Code	Course Title	L	T	P	C
20122DSC54C	Computer Graphics	4	1	0	3

UNIT -I

Overview of Graphics Systems: Graphics applications-CAD, Computer art, Education & Training, Entertainment, Visualization, Image Processing Video display devices –Cathode Ray Tube, Raster-scan displays, Random-scan displays, color CRT monitors – Beam penetration, shadow mask, Flat panel displays – plasma panel, LCD. Graphics Workstation & Viewing system, Interactive Input devices, Hard copy devices. Introduction to OpenGL - syntax, related libraries, header files, display window management using GLUT.

UNIT -II

Graphics Output Primitives: 2 Dimensional world coordinate reference frame in openGL, openGL – point function, Line functions, Polygon Fill – Area functions, character function. Line drawing Algorithm-DDA and Bresenham's, Circle drawing Algorithm-DDA and midpoint, Attributes of Graphics Primitives – color and gray scale, OpenGL- Color functions, Point attributes, Line attributes, Fill area attributes, Character attributes.

UNIT –III

Geometric Transformations: Basic 2 Dimensional transformation - translation, rotation and scaling, Matrix representation and homogenous coordinates, Inverse transformation, Composite translate, rotation and scaling, general 2D pivot point rotation, general 2Dfixed point scaling, OpenGL functions for 2-D geometric transformation.

UNIT-IV

Two-Dimensional Viewing:2 D viewing pipeline, clipping window, Normalization and viewport transformations, OpenGL - 2 D viewing functions. 2 D Clipping - Point clipping, Line clipping-Cohen Sutherland Line clipping, Nicholl-LeeNicholl line clipping, Polygon

clipping – Sutherland Hodgeman polygon clipping, WeilerAtherton polygon clipping, Text clipping. Interactive Input Methods and GUI: Logical classification of Input devices, Input functions for graphical data, Interactive Picture Construction techniques.

UNIT-V

Three Dimensional Viewing and Computer animation:3 Dimensional Viewing: Overview of 3 D viewing concepts, 3D viewing pipelining , three dimensional geometric Transformations-Translation, Rotation and Scaling, Visible surface detection methods - Back face detection, Depth buffer method, Octrees methods, ray casting method. Computer Animation: Raster methods for Computer Animation, Design of Animation Sequences, Motion specifications, Periodic motions. OpenGL Animation Procedures.

REFERENCE BOOKS:

1. Computer Graphics with OpenGL, Donald Hearn and M. Pauline Baker :Pearson Education, Fourth Edition 2018
2. Edward Angel – "Interactive Computer Graphics – A Top-down Approach using OpenGL", Pearson Education, 5th Edition 2009

B.C.A

Course Code	Course Title	L	T	P	C
20122DSC63C	Fundamentals of Digital Computers	4	1	0	3

UNIT -I

Introduction to Number System and Codes Number systems: Decimal numbers , Binary numbers : Counting in binary, The weighted structure of binary numbers, Octal numbers, hexadecimal numbers and their mutual conversions ,Binary arithmetic : Addition, subtraction, multiplication and division of binary numbers, 1's and 2's complement, signed numbers, arithmetic operations: addition, subtraction with signed numbers, 9's and 10's complement, BCD numbers, BCD addition, BCD subtraction, Gray code: Binary to Gray code conversion, Gray to Binary conversion, Weighted code : 8421 code and Non weighted codes : ASCII and EBCDIC.

UNIT -II

Boolean Algebra Boolean operations and expressions, Laws and rules of boolean algebra, Demorgan's Theorem, Boolean expressions, Simplification of Boolean expression.

UNIT –III

Logic Gates

AND gate, OR gate, NOT gate, NAND gate, NOR gate, X-OR gate, X-NOR gate, the Universal property of NAND gate and NOR gate, Realization of basic gates.

Boolean expression for logic circuits, Karnaugh map SOP with examples.

UNIT-IV

Combinational Logic

Basic Adders: Half adder, Full adder, 4-bit Parallel adders, Subtractor: Half subtractor, Full subtractor Implementation using logic gates, Decoders: 4 bit decoder, BCD to decimal decoder, Encoder: Decimal to BCD encoder, Multiplexer: 4 to 1 multiplexer, Demultiplexer: 1 to 4 demultiplexer.

UNIT-V-Flip-flops-Latches: SR latch, Clocked flip-flops: SR flip-flop, D flip-flop, JK flip-flop, Positive edge triggered flip flops, Timing diagrams, Master slave JK flip-flop. Registers and Counters. Modes of operation of registers: SISO, SIPO, PISO, and PIPO, Asynchronous

counters: Four bit ripple counter, Decode counter, Synchronous counters: Four bit synchronous counter, Decode counter.

REFERENCE BOOKS:

[1] Floyd, Thomas L: Digital Computer Fundamentals, 11th Edition, Pearson International, 2015.

[2] Malvino, Paul Albert, Leach, Donald P,GautamSaha: Digital Principles And Applications, TMH ,8th Edition, 2015.

[3] Bartee, Thomas C: Digital Computer Fundamentals, 6 Edition,TMH, 2010.

B.Sc.CS

Course Code	Course Title	L	T	P	C
20120DSC54D	Introduction to Software Engineering	4	1	0	3

UNIT I

Introduction — definition-size factors- quality and productivity factors- managerial issues. Planning - software project — introduction — defining the problem - developing a strategy - planning the development process- planning an organizational structure.

UNIT II

Software cost estimation — cost factors — cost estimation techniques — staffing — level estimation — estimating software maintenance costs. Software requirements definition — software requirements specification techniques — languages and processors for requirements.

UNIT III

Software design — fundamental design concepts — modules and modulation criteria — design notations — design techniques — detail design considerations — real time and distributed system design — test plans — milestones walkthroughs and inspections — design guidelines.

UNIT –IV

Implementation issues — structured coding techniques — coding style — standards and guidelines — documentation guidelines — data abstraction — exception handling — concurrency mechanisms.

UNIT V

Verification and validation techniques — quality assurance — walkthrough and inspections — static analysis — symbolic executions — unit testing and debugging — system testing — formal verification. Software maintenances — enhancing maintainability during development — managerial aspects — configuration management — source code metrics.

Text Book: Software Engineering Concepts "— Richard fairly TMH

Reference Book: "Software Engineering"- Roger Pressman, 5th edition 20

B.Sc.CS

Course Code	Course Title	L	T	P	C
20120DSC63D	System Programming	4	1	0	3

UNIT I

Introduction to System Programming- Overview of system programming, the role of system programming in the software stack, Differences between system programming and application programming.

UNIT II

Assembly Language Basics-Introduction to assembly language, Basic syntax and structure, Writing and running simple assembly programs. **Assembly Language and C Interfacing-** Calling conventions and linking assembly with Inline assembly in C/C++, Practical examples and exercises.

UNIT III

System Calls and OS Interaction: Introduction to system calls and their purpose, using system calls in C (e.g., file operations, process control), Writing programs that interact with the operating system. **System Calls and OS Interaction:** Introduction to system calls and their purpose, using system calls in C (e.g., file operations, process control),
Writing programs that interact with the operating system.

UNIT –IV

Memory Management: Overview of memory management concepts, Virtual memory and paging, Implementing and understanding memory allocation (malloc, free, etc.)
Process Management: Process creation and control (fork, exec, wait)
Process synchronization and inter-process communication (IPC), Threads and concurrency.

UNIT V

File Systems and I/O: File system architecture and structure, File handling and I/O operations, System calls for file manipulation and directory management **Low-Level Data Structures and Algorithms:** Implementing low-level data structures (e.g., linked lists, queues), Algorithms for efficient memory use and process management, Optimization techniques for system code.

Textbooks:

"Systems Programming: Designing and Developing Your Own Operating System" by Richard Blum
"Advanced Programming in the UNIX Environment" by W. Richard Stevens and Stephen A. Rago

M.C.A

Course Code	Course Title	L	T	P	C
20222DSC17C	Distributed Systems	4	1	0	3

UNIT I -Introduction to Distributed Systems: Definition and characteristics of distributed systems, Key challenges: communication, synchronization, and consistency, Examples of distributed systems and their applications. **Distributed System Architectures:** Client-server architecture, Peer-to-peer architecture, Distributed objects and services.

UNIT II-Communication in Distributed Systems: Inter-process communication (IPC), Message passing and remote procedure calls (RPC), Communication protocols (e.g., HTTP, gRPC, REST). **Synchronization and Coordination:** Clock synchronization (e.g., NTP, logical clocks), Coordination services (e.g., Zookeeper, Consul), Distributed algorithms for mutual exclusion and consensus.

UNIT III-Consistency and Replication: Consistency models (e.g., strong consistency, eventual consistency), Data replication techniques and strategies, Consensus protocols (e.g., Paxos, Raft). **Fault Tolerance and Reliability:** Fault detection and recovery mechanisms, Redundancy and replication strategies, Handling partial failures and network partitions

UNIT –IV-Scalability and Performance: Load balancing and partitioning, Performance metrics and evaluation, Scalability challenges and solutions. **Distributed File Systems and Databases:** Distributed file systems (e.g., Hadoop HDFS, Google File System), Distributed databases and NoSQL systems (e.g., Cassandra, Mongo DB), Query processing and transaction management.

UNIT V-Security in Distributed Systems: Security challenges and threats, Authentication, authorization, and encryption, secure communication and data integrity. **Case Studies and Emerging Trends:** Real-world case studies of distributed systems (e.g., cloud computing, micro services), Emerging trends and technologies (e.g., block chain, edge computing), Future directions and research in distributed systems

Textbooks:

- "Distributed Systems: Principles and Paradigms" by Andrew S. Tanenbaum and Maarten Van Steen
- "Designing Data-Intensive Applications: The Big Ideas Behind Reliable, Scalable, and Maintainable Systems" by Martin Kleppmann
- "Distributed Systems: Principles and Paradigms" by Robbert van Renesse and Peter Druschel

VALUE ADDED COURSE SYLLABUS 2021-2022

COURSE: Diploma in Web Application development and hosting
SUBJECT CODE: 21DPWP123

MODULE -1

Basics of Web Designing - Multimedia and its Applications - Web Technologies - Introduction to Web Design & Applications - Computer Graphics - Mathematical Structure for Computer Science
HTML
CSS
JavaScript
Bootstrap

MODULE -2

Adobe Dreamweaver - Adobe Flash - Available Software for Graphic Designing - Animation Techniques - Web Hosting Basics - Types of Hosting Packages - Registering domains - Defining Name Servers
Using Control Panel - Creating Emails in C panel - Using FTP Client - Maintaining a Website

MODULE -3

HTML5 Elements and Semantics - CSS3 Advanced Styling Techniques - Responsive Design and Media Queries - JavaScript Fundamentals - JavaScript Syntax and Operators - DOM Manipulation and Event Handling - Asynchronous JavaScript (Promises, Async/Await)

MODULE -4

Server-Side Scripting - Introduction to Node.js and Express.js (or other server-side languages/frameworks) - RESTful API Design and Implementation - Handling HTTP Requests and Responses – Databases - Introduction to Databases (SQL vs. NoSQL) - CRUD Operations with SQL (e.g., MySQL, PostgreSQL) - Working with NoSQL Databases (e.g., MongoDB)

MODULE -5

User Authentication (e.g., OAuth, JWT) - Role-Based Access Control - Security Best Practices - Full-Stack Development - Integrating Front-End and Back-End - Connecting Front-End to Back-End APIs - Handling Form Submissions and Data Processing - Error Handling and Validation

Course : DIVERSITY IN PYTHON PROGRAMMING
Subject Code : 21CCPY01

Aim:
To Learn the Diversity in Python Programming Language.

Syllabus:
Installing Python IDES – Python IDLE and Anaconda
Writing Your First Python Program
Data-types in Python
Variables in Python – Declaration and Use
Typecasting in Python
Operators in Python – Assignment, Logical, Arithmetic etc
Taking User Input (Console)
Conditional Statements – If else and Nested If else and elif
Python Collections (Arrays) – List, Tuple, Sets and Dictionary
Loops in Python – For Loop, While Loop & Nested Loops
String Manipulation – Basic Operations, Slicing & Functions and Methods
User Defined Functions – Defining, Calling, Types of Functions, Arguments
Lambda Function
Importing Modules – Math Module

Course Outcomes:
-Interpret the fundamental Python syntax and semantics and be fluent in the use of Python control flow statements.
-Demonstrate proficiency in the handling of strings and functions.
-Determine the methods to create and manipulate Python programs utilizing the data structures like lists, dictionaries, tuples and sets.
-Identify the commonly used operators including the comparison and logical operators.
-Demonstrate the Object Oriented Programming concepts such as classes, objects, inheritance and exception handling in Python.

Reference Books
The Complete Reference in Python-Martin C Brown

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Course Name: Certificate Course On Digital Marketing

Course Code: 21CCDM02

CO1 Understanding the concepts of Digital Marketing, Google Ad words, and social media

CO2 Identifying the domains for digital marketing.

CO3 Analysis of social media and social network with respect to marketing

Unit I

Digital Marketing Fundamentals – Website Planning and Structure – Facebook Marketing for Business

Unit II

Google Adwords: Understanding Adwords Google Ad Types Pricing Models PPC Cost Formula Ad Page Rank Billing and Payments Adwords User Interface Keyword Planning Keywords Control Creating Ad Campaigns Creating Text Ads Creating Ad Groups Bidding Strategy for CPC Practical Examples

Unit III:

LinkedIN and Twitter Marketing-: Google Analytics and Webmaster Tool –Search Engine Optimization (SEO) – Affiliate Marketing & Google AdSense – Case Studies and Practical Assignments – Google Certification Program Training

Unit IV

Marketing v/s Sales Section -: Marketing Mix and 4 Ps –What is Digital Marketing? Inbound vs Outbound Marketing
– Content Marketing – Understanding Traffic – Understanding Leads – Strategic Flow for Marketing Activities.

Unit V

PPC Advertising YouTube and Video Marketing E-mail Marketing for Business- Lead Generation & Marketing Automation- eCommerce and Payment Gateway –Remarketing Strategies – Advance Level- Google Plus for Business

Reference Books:

1. Ryan Deiss, Russ Henneberry, "Digital Marketing for Dummies", A Wiley Brand.
2. Ian Dodson, "The Art of Digital Marketing", Wiley
3. Calvin Jones and Damian Ryan, "Understanding Digital Marketing", Koganpage, IVEdition.

Course Name: Certificate Course On Data Analysis Using Ms-Excel

Course Code: 21CCDAM03

After completion of the course student will be able to

CO1 Indicate the names and functions of the Excel interface components.
CO2 Format& edit data and cells.
CO3 Construct formulas, including the use of built-in functions, and relative and absolute references.
CO4 Create charts and preview worksheets.

Unit I

Introduction to Excel: About Excel & Microsoft - Uses of Excel - Excel software - Spreadsheet window pane - Title Bar - Menu Bar - Standard Toolbar - Formatting Toolbar - the Ribbon - File Tab and Backstage View - Formula Bar
- Workbook Window - Status Bar - Task Pane - Workbook & sheets
Columns & Rows: Selecting Columns & Rows - Changing Column Width & Row Height – Auto fitting Columns & Rows - Hiding/Unhiding Columns & Rows - Inserting & Deleting Columns & Rows - Cell - Address of a cell - Components of a cell – Format – value – formula - Use of paste and paste special

Unit II

Functionality Using Ranges: Using Ranges - Selecting Ranges - Entering Information Into a Range - Using AutoFill Creating Formulas. (4 hours) Using Formulas - Formula Functions – Sum - Average, if, Count, max, min, Proper, Upper, Lower, Using AutoSum.

Advance Formulas: Concatenate, Vlookup, Hlookup, Match, Countif, Text, Trim Spreadsheet Charts (4 hours) Creating Charts - Different types of chart, Formatting Chart Objects - Changing the Chart Type - Showing and Hiding the Legend - Showing and Hiding the Data

Unit III

Table Data Analysis: Sorting, Filter - Text to Column - Data Validation PivotTables - Creating PivotTables - Manipulating a PivotTable - Using the PivotTable Toolbar - Changing Data Field – Properties - Displaying a PivotChart - Setting PivotTable Options - Adding Subtotals to PivotTables

Unit IV

Spreadsheet Tools: Moving between Spreadsheets, Selecting Multiple Spreadsheets - Inserting and Deleting Spreadsheets Renaming Spreadsheets - Splitting the Screen - Freezing Panes - Copying and Pasting Data between Spreadsheets-Hiding-Protecting worksheets

Unit V:

Making Macros: Recording Macros - Running Macros - Deleting Macros

Text Book:

1. Microsoft Office Excel, Torben Lage Frandsen, www.Bookboon.com

Dr.K.T.Senthil Kumar	
Dr.K.Saravanan	
Dr.R.Maruthi	
Dr.AV.Seethalakshmi	
Dr.G.Preethi	
P.Karthik	
G.Gayathri	
Dr.K.Rajiv Gandhi	
Mr.S.Ganapathy	

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SCHOOL OF EDUCATION

DEPARTMENT OF EDUCATION

BOARD OF STUDIES MEMBERS OF B.Ed. & M.Ed. 2021-2022

CIRCULAR

By direction Board of Studies meeting for the department of Education will be held on 12.11.2021 at 2.00 p.m. in Education Dean Cabin, PRIST DEEMED TO BE University. The following committee members are requested to attend the meeting.

AGENDA

- Discussion of Curriculum & Syllabus in B.Ed. (Education) Full Time programme – Regulation 2019
- Discussion of Curriculum & Syllabus in M.Ed. (Education) Full Time programme – Regulation 2019

CHAIRMAN BOS

TO COMMITTEE MEMBERS:

Dr.K.B.Jasmine Suthandira Devi, Dean/ PRIST DEEMED TO BE University (Chairman, BOS)

Dr.N.Sasikumar, Asst. Prof/ Alagappa University (External Member, BOS)

Dr.P.Srinivasan, Asst. Prof/ Central University, Thiruvarur (External Member, BOS)

Dr.P.Rajasekar,Prof/ PRIST DEEMED TO BE University (Member, BOS)

Dr.R.Arivalan, Prof/ PRIST DEEMED TO BE University (Member, BOS)

Dr.M.Balasubramanian, Associate Prof/ PRIST DEEMED TO BE University (Member, BOS)

Dr.D.Muruganantham, Associate Prof/ PRIST DEEMED TO BE University (Member, BOS)

Dr.M.Aron Antony Charles, Associate Prof/PRIST DEEMED TO BE University (Member, BOS)

Dr. P. Subathra, Associate Prof. / PRIST DEEMED TO BE University (Member, BOS)

Dr.R. Gunasekaran, Asst. Prof. / PRIST DEEMED TO BE University (Member, BOS)

Mrs.T.Subashini, Asst. Prof. / PRIST DEEMED TO BE University (Member, BOS)

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SCHOOL OF EDUCATION

DEPARTMENT OF EDUCATION

MINUTES OF BOARD OF STUDIES MEETING

The Board of Studies meeting for the department of Education will be held on 12th Noemvber,2021 at 2.00 p.m. in Education Dean Cabin, PRIST DEEMED TO BE University.

THE FOLLOWING MEMBERS WERE PRESENT:

Dr.K.B.Jasmine Suthandira Devi, Dean/ PRIST DEEMED TO BE University (Chairman, BOS)
Dr.N.Sasikumar, Asst. Prof/ Alagappa University (External Member, BOS)
Dr.P.Srinivasan, Asst. Prof/ Central University, Thiruvarur (External Member, BOS)
Dr.P.Rajasekar,Prof/ PRIST DEEMED TO BE University (Member, BOS)
Dr.R.Arivalan, Prof/ PRIST DEEMED TO BE University (Member, BOS)
Dr.M.Balasubramanian, Associate Prof/ PRIST DEEMED TO BE University (Member, BOS)
Dr.D.Muruganantham, Associate Prof/ PRIST DEEMED TO BE University (Member, BOS)
Dr.M.Aron Antony Charles, Associate Prof/PRIST DEEMED TO BE University (Member, BOS)
Dr. P. Subathra, Associate Prof. / PRIST DEEMED TO BE University (Member, BOS)
Dr.R. Gunasekaran, Asst. Prof. / PRIST DEEMED TO BE University (Member, BOS)
Mrs.T.Subashini, Asst. Prof. / PRIST DEEMED TO BE University (Member, BOS)

Dr. K.B.Jasmine Suthandira Devi, Chairman (BOS) chaired the meeting and Dr.R.Arivalan Prof/Education welcomed all the members to the BOS meeting. He introduced the members of BOS.

The Committee carefully reviewed and discussed the curriculum and syllabi in detail and resolved to make necessary changes wherever required.

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The suggestions are as follows:

The Board has thoroughly scrutinize the syllabus and unanimously decided to continue the same curriculum for both B.Ed. and M.Ed. programme for the academic year 2020-2021.

The Board also prepared a Panel of Examiners for the department of Education (B.Ed. & M.Ed.) courses and submitted the same to the academic council for its Approval.

List of value added course: Essentials of educational psychology, Positive Psychology, Research skills,, SPSS,, Economics of education

The Meeting concluded with thanks from Chairperson/ Board of Studies.

Signature of the Chairman & Members

1. K. B. Jasmine Suthandri
2. K/ [illegible]
3. P. Srinivasan
4. [illegible]
5. R. Arivalan
6. [illegible]
7. S. Murugan
8. M. Arun Antony Charles
9. P. Suganthi
10. [illegible]
11. T. [illegible]

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SCHOOL OF EDUCATION
VALUE ADDED COURSE
COURSE CODE: 21130VAC1

ESSENTIALS OF EDUCATIONAL PSYCHOLOGY

OBJECTIVES

The student teacher will be able to

- Understand the differents chools of psychology
- Compare and contrast the strength and weakness of different methods of psychology
- Spellout the biogenic and socio-genic motives and various theories of motivation
- Explain the factor sinfluencing self-regulation of the learners
- Understand the concepts of intelligence,itstheories and measurement

UNIT I Introduction to Psychology: Meaning - Definitions -Branches of Psychology - Goals of Psychology - Basic Psychological Process - Fields of Psychology- Schoolsof Psychology- Structuralism, Psychoanalysis, Behaviourism and Humanism.

UNIT II Educational Psychology: Meaning - Nature -Aims - Scope - Relation between Psychology and Education- Latest tiends in Educational Psychology- EducationalPsychologistsandtheirexperiments.

UNIT III MethodsofEducationalPsychology:(a)Introspectionmethod (b)Observationmethod(c)Clinicalmethod(d)Experimentalmethod (e) Case Study method Principles - Procedure - Merits and Demerits of the Methods.

UNIT IV Growth and Development: Meaning-FactorsInfluencingGrowthand Development – difference between growth and development - Stages of Development and its characteristics- Adolescence: Problems and solutions- Role of teachers, parents,an dpeer group in a dolescence

Referent book:

Introduction, Methods And Growth & Development Of Educational Psychology

Introductioo To Psychology

Educational Psychology Introduction, Methods And Growth & Development Of Educational Psychology

Methods Of Educational Introduction, Methods And Growth & Development Of Educational Psychology

Growth And Development Introduction, Methods And Growth & Development Of Educational Psychology

OUTCOMES

- ✓ Comprehendthepersonalitytheories and assessmentofpersonality
- ✓ Applythedifferenttypesofmechanismsindifferentsituations
- ✓ Acquireskillsandcompetenciesindesigning aadapplicationofpsychologicaltoolsandtechniques
- ✓ Debatethestrengthandweaknessofstandardizedtesting

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SCHOOL OF EDUCATION
VALUE ADDED COURSE
COURSE CODE: 21130VAC2
POSITIVE PSYCHOLOGY

OBJECTIVES:

On completion of this course, the student teacher will be able to

- Explain the factor influencing self-regulation of the learners
- Understand the concepts of intelligence, its theories and measurement
- Suggests ways to fostering creativity among the learners
- Comprehend the personality theories and assessment of personality

UNIT 1: Introduction to positive psychology

Meaning. Definition. Assumptions and Goals of positive psychology. History of positivepsychology

UNIT 2: Happiness and well-being.

Happiness: Meaning and measures of happiness; Types of happiness, Effects of happiness. Factors contributing to happiness. Wellbeing: subjective and psychological wellbeing. Hedonic and Eudemonic basis ofwellbeing. Broaden and built theory. PERMA model.

UNIT 3: Positive emotions

Positive and negative emotions. Optimism and hope: expectations and risk homeostasistheory. Neuron-biology of optimism. Flow: self-determination theory. Intrinsic and meta-motivational state.

UNIT 4: Pro-social behavior and inter-personal relationship

Altruism: definition. Empathy-altruism hypothesis. Biological and neural basis of empathy (in brief). Cultivating and measuring altruism. Forgiveness: definition. Measures of forgiveness. Neural basis of forgiveness (in brief). Personality and forgiveness. Factors influencing forgiveness. Forgiveness and physical health. Gratitude: definition. Psycho-physiological basis of gratitude. Factors influencing gratitude. Measures of gratitude. Cultivating gratitude and its importance

UNIT 5: Interventions

Cultivating positive emotions and relationship; creating flow, hope therapy, mindfulness and meditation, positive Psychological interventions

Outcomes:

Compare and contrast the strength and weakness of different methods of psychology

Spell out the biogenic and socio-genie motives and various the oriels of motivation

Apply the different types of mechanisms in different situations

Acquire skills and competenciesindesigning and application of psychological tools and techniques

Reference:

- Atkinson, Richard C., et. Al (1983). Introduction to Psychology, Harcount Brace Joranovich Inc., New Yock.
- Bickhard, M.H Chrisopher, J.C (1994) The influence of early Experience on Human Personality Development, New Ideas in Psychology.
- Christian, Jyothi (1984) Classroom Group Dynnamics. Meerut: Anu Books.
- Delamater, John.(2003). Handbook of Social psychology. Springer.
- Dutt, Suresh (1997) society and Education, Anmol Publications.
- Erickson, E.H.(1968) Identity, Youth and Crisis. New York W.W.Norton.
- Klausmeier, Herbert J(1985) Educational Psychology. Harper and Row, Pub. New York

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VALUE ADDED COURSE
Research skill
COURSE CODE: 21130VAC3

OBJECTIVES
The student teacher will be able to

- Identify the different t types of research
- Identify the appropriate research problem pertaining to his/her dissertation work
- Write the review of literature in accordance with the7th edition of the Manual of Research Skill association
- Write are search proposalinan effective manner

Unit I **Introduction to Research and Research Design**

Nature and scope of research, information based decision making and source of knowledge. The research process: basic approaches and terminologies used in research. Defining research question and framing of hypotheses, Preparing a research plan, qualitative and quantitative research designs, Experimentation, Observational studies, Exploring secondary data.

Unit II **Measurement and Scaling, Data Source and Data Collection**

Field research ;primary data collection from observations, surveys and experimentation. Measurement and scaling: commonly used scales in reliability and validity of scales.
Designing in strumpet for data collection; testing the Instrument, data collection process, Sampling methods and procedures and sample size decisions.

Unit III **Data Analysis**

Editing and coding of data,tabulation,graphic presentation of data. cross tabulation, Testing of hypotheses: type I and II errors, one tailed and two tailed tests of significance, Parametric andnonparametrictestsforUnivariateandBivariatedata.Testsofassociations;simplelinear regression and other nonparametric tests.

Unit IV **Report Writing and Presentation**

Need for Effective documentations. Importance of Report Writing, types of research reports Report structure, Report preparation and presentations , Tables, Graphs, Charts, Referencing etc.

Reference:-Research Methods for Business Students-Pearson Education
Research Methodology by D.K.Bhattacharyya-Excel
Research Methodology by Kothari

Out comes: CO1: Reflecton the role of research in teaching and over all professional development
CO2: Discuss ways of ensuring integrity and ethics in conducting research
CO3: Understand the process of research
CO4: Comprehend the research design and research plan
CO5:Recognizetheresearchproblem

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VALUE ADDED COURSE

SPSS

COURSE CODE: **21130VAC4**

OBJECTIVES

The student teacher will be able to

- Get. hands on SPSS to learn various statistical measurement and its analysis.
- Enable to distinct various competencies in standardizing different types of measuring instrument.
- Familiarize to construct different kinds of tests and tools.

UNIT I:IntroduciontoSPSS

SPSSEnvironment:data editor,outputviewer,syntax editor –Data view window – SPSS Syntax – Data creation – Importing data – Variable types in SPSS and Defining variables – Creating a Codebook in SPSS.

UNIT II:WorkingwithData

ComputingVariables-Recoding(Transforming)Variables:RecodingCategorical String Variables using Automatic Recode - Rank Cases - Sorting Data - Grouping or Splitting Data.

UNIT III:ExploringData

Descriptive Statistics for Continuous Variables - The Explore procedure - FrequenciesProcedure– Descriptives-CompareMeans-FrequenciesforCategorical Data.

UNIT IV:AnalysingData

Inferential Statistics for Association: Pearson Correlation, Chi-square Test of Independence – Inferential Statistics for Comparing Means: One Sample t Test, Paired- Samples T Test, Independent Samples T Test, One-Way ANOVA.

References

- IBM 2016, *IBM Knowledge Center: SPSS Statistics*, IBM, viewed 18 May 2016, https://www.ibm.com/support/knowledgecenter/SSLVMB/welcome/
- HOW TO USE SPSS ® A Step-By-Step Guide to Analysis and Interpretation, Brian C. Cronk, Tenth edition published in 2018 by Routledge.
- SPSSforIntermediateStatistics:UseandInterpretation,NancyL.Leech et. al., Second edition published in 2005 by Lawrence Erlbaum Associates, Inc.
- Using IBM SPSS statistics for research methods and social science statistics, William E. Wagner, Fifth edition published in 2015 by SAGE Publications, Inc.

- **Course Outcomes**
- Students'familiaritywiththe tool box of statisticalsoftware.
- Capacitatingstudentsinanalyzingcomplexinformationwiththehelpofstatistical software – Statistical Package for Social Sciences (SPSS).
- Astrongtheoreticalandempiricalfoundationinstatistical analysis.

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VALUE ADDED COURSE
ECONOMICS OF EDUCATION
COURSE CODE: 21130VAC5

OBJECTIVES

The student teacher will be able to

- Acquire knowledge of the concept of economics of education.
- Understand the economic value of education.
- Acquire the knowledge of human resources development.
- Understand the Principle, policies and techniques pertaining to economics of education.
- Understand the contemporary developments in economics of education
-

UNIT-I Meaning, Nature and Scope of economics–Significance and recent trends in economics of education–Education as consumption and investment–The concept and measurement of human capital–Education and its relation to Human resource development.

UNIT–II The concept of Human resource development–Indicators of human resource development and indicated in the study of Harbison and Meyers–The ways of developing resources–Problems of human resource development underutilized manpower.

UNIT–III The concept of Manpower–Manpower planning and Economic development–Estimation of manpower requirements–Historical approach, cross section comparison method–Surveys of Businessman- utility of each method–Suggestions, problems of manpower estimation technology changes–Migratory flow–Theoretical considerations-Labour supply forecast and educational planning–Education and labour market–Skill development shortage and surpluses.

UNIT–IV Education and Economic growth–Education and National Development–Education and the distribution of Income- Education, Population and Poverty–Liberalization, Privatization, Globalization and Education–Contemporary issues in Economic of Education.

UNIT–V Educational planning–Meaning–Objectives- Characteristics of good planning-Institutional Planning Education policy considerations–Centralized and decentralized planning-advantages of planning at the Central and State levels- Different approaches to planning–The Social demand approach–The manpower approach–Rate of return-Limitation of each-Macro models–Systems approach to educational planning, simulation techniques in educational planning–Limitations.

REFERENCES

- Baijit Singh Ed., Education as Investment.
- Blaug Mark,(1976) An Introduction to the Economics of Education, Penguin, London.
- Cohn Elchannan, (1975) The Economics of Education Mas, Cambridge Ballinger
- Publishing Co.,
- Martiao, Deonobue, Economic Dimensions in Education, Dubline Cabil & Co Ltd.,

OUTCOMES :

CO1:Preparecontentformobilelearning
CO2:Usemobilelearningintheclassroom
CO3:Usewhite boardintheclassroominstruction
CO4:Implementonlineevaluationintheirstudents
CO5:DevelopE–portfolios

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VALUE ADDED COURSE
GENDER SENSITIZATION
COURSE CODE: 21130VAC6

OBJECTIVES

The student teacher will be able to

- To introduce gender sensitization and related issues.
- To raise and develop social consciousness among the students.
- To sensitize the students regarding the issues of gender and the gender inequalities prevalent in society.
- To initiate the gender perspective in all domains of understanding Gender Studieswith the issues of their daily life.
- To encourage capacity building among the students to enable them to engage in policy decisions to remove gender biases in all fields of life in the process of gender equality for nation building.

UNIT - I Understanding Gender and Related Concepts

Gender : Sex vs. Gender, Social construction of Gender, Gender Roles, Gender Stereotypes, Gender division of Labour,Patriarchy,House Work,Gender Based Violence,Sexualities,Inter Sectionally,Gender, Caste & Class

UNIT - II Gender Sensitization

Gender Sensitization : Meaning, Nature & importance,Challenges before Gender Sensitization practices for Gender Sensitization

UNIT - IIII Towards Equality : Convention & Declaration

Convention on the Elimination of all Forms of DiscriminationAgainst Women (CEDAW) Declaration on the Elimination of Violence Against Women(DEVAW

UNIT - IV Towards Equality : Constitutional Provisions and Acts

Gender Equality; Constitutional Provisions-Protection of Women from Domestic Violence Act, 2005-Protection of Children from Sexual Offences Act, 2012-Sexual Harassment of Women at Workplace (Prevention,-Prohibition and Redressal) Act, 2013

Reference Book

1. Jane Pilcher & Imelda Whelehan :*50 Key Concepts in Gender Studies*, SAGE Publications, New Delhi
2. Bhasin, kamla :*What is Patriarchy?*, Kali for Women, New Delhi
3. V. Geetha :*Gender*, STREE-SAMYA, Kolkata
4. V. Geetha :*Patriarchy*, STREE-SAMYA, Kolkata

Links: **Understanding Gender - https://youtu.be/MxhBl6trdfg**

1. Basic concept of sex and gender, gender attributes & questions of identity (WS) - https://youtu.be/k7GZ02hbIWQ
2. Gender and Intersectionality theory - https://youtu.be/JqdMLj6sYwo
3. Patriarchy - https://youtu.be/-fl9qsqaRg8
4. Gender Sensitisationmeaning - https://youtu.be/BrfCAPfqpyk
5. Gender Sensitisation: Issues and Challenges - https://youtu.be/rECOSt6yu4I

Outcomes: CO1:Comprehend the concept, meaning and nature of measurement and evaluation
CO2:Understand the relationship between measurement and evaluation.
CO3:Acquire knowledge about various tools of measurement and evaluation in existence
CO4:Develop skills on using psychological test for measurement and evaluation.

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SCHOOL OF COMMERCE AND BUSINESS MANAGEMENT

DEPARTMENT OF COMMERCE

MINUTES OF BOARD OF STUDIES MEETING

2021-2022

The Board Of Studies Meeting For The Department Of Commerce Is Held On At 10.Am.In 20.05.2021, Prist Deemed To Be University Thanjavur Under The Chairmanship (Dr.U.Rajan/Dean(Chairman ,Bos)

The Following Members Were Present:

Dr.S.Rajendran (Chairperson/Hod /Bos Member)

Dr.R.Saminathan (External Expert-Academic/Bos Member)

CA. S. Venkataraman (External Expert- Industry/Bos Member)

Dr.R.Selvaraj (Professor/Bos Member)

Dr.S.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.U.Rajan (Special Invitee-Dean/Bos Member)

G.Gayathri(Special Invitee-Alumnus/Alumna)

D.Abishek(Special Invitee -Current Student)

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

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

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Introduce The Following Discipline Specific Elective Courses :

NAME OF THE PROGRAMME	NAME OF THE COURSE	COURSE CODE	YEAR OF INTRODUCTION
B. Com	Financial Technology and Analytics	19161DSC55C	2021
B. Com	Modern Management Techniques	19161DSC55D	2021
B. Com	Financial Institutions and Markets	19161DSC55E	2021
B. Com	International Tax and Regulations	19161DSC55F	2021
B.Com CA	Micro Finance	19198DSC64C	2021
B.Com CA	Enterprise Resource Planning	19198DSC64D	2021
B.Com CA	Regulations of Insurance Business	19198DSC64E	2021
B.Com CA	Financial Economics	19198DSC64F	2021
M.Com	Integrated Marketing Communication	19261DSC34C	2021
M.Com	Corporate Communication and Advertising	19261DSC44C	2021

The Following Value Added New Diploma and Certificate Course (2021-2022)

S.NO	COURSE TITLE	COURSE CODE
1	Certificate Course In Online Trading	2161COT
2	Certificate Course In Knowledge Management	2161CKM

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The Following Members And chairman signature:

Dr.S.Rajendran (Chairperson/Hod /Bos Member)

Dr.R.Saminathan (External Expert-Academic/Bos Member)

CA. S. Venkataraman (External Expert- Industry/Bos Member)

Dr.R.Selvaraj (Professor/Bos Member)

Dr.S.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.U.Rajan (Special Invitee-Dean/Bos Member)

G.Gayathri(Special Invitee-Alumnus/Alumna)

D.Abishek(Special Invitee -Current Student)

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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
19161DSC55C/ 19161DSC55D	Financial Technology and Analytics/ Modern Management Techniques	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**

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DISCIPLINE SPECIFIC ELECTIVE COURSES

SEMESTER	COURSE CODE	COURSE TITLE
V	19161DSC55A	Stock Exchange Practice
	19161DSC55B	Cooperative Law and Practice
	19161DSC55C/	Financial Technology and Analytics
	19161DSC55D	Modern Management Techniques
	19161DSC55E/	Financial Institutions and Markets
	19161DSC55F	International Tax and Regulations
	19161DSC55E	Financial Institutions and Markets
	19161DSC55F	International Tax and Regulations
VI	19161DSC64A	Income Tax Law and Practice
	19161DSC64B	Co-Operation Theory

Open Electives

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

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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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
19198RLS27	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

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
19198DSC64C / 19198DSC64D	Micro Finance Enterprise Resource Planning	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

DISCIPLINE SPECIFIC ELECTIVE

SEMESTER	ELECTIVE NO	COURSE CODE	COURSE TITLE
V	I	19198DSC55A 19198DSC55B	Management Information System Stock Market Practice
VI	II	19198DSC64A 19198DSC64B 19198DSC64C 19198DSC64D 19198DSC64E 19198DSC64F 19198DSC64G 19198DSC64H	E- Commerce Web Designing Micro Finance Enterprise Resource Planning Regulations of Insurance Business Financial Economics Regulations of Insurance Business Financial Economics

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OPEN ELECTIVE

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
M.Com– REGULATION 2019COURSE 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
19261DSC34C	Integrated Marketing Communication	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
19261DSC44C	Corporate Communication and Advertising	5	0	4
19261PRW45	Project Work	-	-	6
19261PEE	Program – Exit Examination			2

	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 Behavior
II	19261DSC25A 19261DSC25B	Corporate Legal Frame Work Retail Management
III	19261DSC34A 19261DSC34B 19261DSC34C	Indian Financial System International Marketing Integrated Marketing Communication
IV	19261DSC44A 19261DSC44B 19261DSC44C	Information Technology and Computer Applications International Financial Management Corporate Communication and Advertising

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

Financial Technology and Analytics

19161DSC55C

OBJECTIVES:

It's about making financial services more accessible, affordable, and personalized. By automating mundane tasks, providing data-driven insights, and creating innovative products, finch is redefining the way we manage our money

COURSE OUTCOME:

Analyze organizational structures and management processes to recommend improvements to organizational performance through financial technology solutions.

UNIT-1

Financial System in India- Financial Statement Analysis and Reporting- Fundamentals of Data Analytics Management Concepts and Organization Behavior- Financial Information System with Big Data

UNIT-2

Strategic Financial Management- Investment Management- Digital Marketing and CRM- Advanced Data Analytics Financial Technology Services & Management- Business Intelligence.

UNIT-3

Design and Critical Thinking for Business Strategy and Startups- Derivatives and Risk Management- Human Resource Management- Legal Aspects of Business & Financial Regulations- Financial Information Security & Privacy.

UNIT-4

Global Financial Markets and Instruments-

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B.COM

Modern Management Techniques

19161DSC55D

OBJECTIVES:

primary objective of management includes maintaining the quality standards necessary for the organization. The team collaborates with other departments, supervisors and employees to create, implement and maintain quality.

COURSE OUTCOME:

COURSE OUTCOME:

he modern management theory emphasizes the use of mathematical techniques. These techniques allow managers to make decisions based on data and evidence rather than personal opinions or feelings. They also enable the testing of different options to assess which one best supports the organization.

UNIT-1

Managing organization planning

- Competitive advantage;
- Strategic planning process;
- SWOT analysis;
- Stakeholders;
- Factors inside the organization;
- Factors outside the organization;
- Grand Strategy;
- Mission statements;
- Action/implementation plan;
- Not-for-profit note;
- Strategic planning diagram;
- Turning a challenge into a learning curve.

UNIT-2

Management: Definition and Overview

- Definition of management;
- Manager job titles;
- Management functions;
- Management skills;
- Managerial and technical activities at different levels of management;
- Key management concepts;
- Management process;
- Management skills and competencies;
- Personal competencies for managerial success.

UNIT-3

Social Management

- Theoretical arguments against social responsibility;
- Practical arguments against social responsibility;
- Theoretical arguments for social responsibility;
- Practical arguments for social responsibility;
- Degrees of corporate social responsibility involvement;
- Social obligation approach;
- Social responsibility approach;
- Social responsiveness approach;
- Typical behavior of each level of social concern;
- Social audit;
- Types of social audit;

- Areas of social concern in current management practice

UNIT-4

Team management. Work Group Dynamics and Creativity

- Micro and macro organizational views;
- Basic characteristics of groups;
- Span of control;
- Basic group forms;
- Committee chairperson;
- Committee members;
- Development stages of groups;
- Specific characteristics of groups;
- Groups and creativity.

UNIT-5

- Project management and process management;
- Project organization and responsibilities;
- Organizational models;
- Project scope management;
- Project time management;
- Project cost management;
- Project plan;
- Progress and performance management;
- Project monitoring, evaluation and control;
- Risk management.

B.COM

Financial Institutions and Markets

19161DSC55E

OBJECTIVES:

The objective of this paper is to introduce students to role and functioning of financial markets, financial products that are traded in such financial markets and institutions associated with financial markets. It explains the role of financial system on economic development. Various conceptual issues related to risk and return, the role of regulatory bodies, mechanism of commercial banking, operations of insurance companies and mutual funds are discussed elaborately. This will enable them to take the rational decision in financial environment.

Outcomes:

Financial architecture of an economy and its key players.
The fabrication of Indian Financial markets.
Working of Capital market, debt market, money market in India
Functioning of different players in the financial market including Regulators like RBI ,SEBI, PFRDA and IRDA

UNIT-1**Indian Financial System and major Institutions:**

Structure of Indian Financial System: An overview of the Indian financial system, major reforms in the last decade: Payment banks, GST, monetary policy, Insolvency and Bankruptcy code; issues in financial reforms and restructuring; future agenda of reforms;

UNIT-2**Regulatory Institutions in India:**

RBI,SEBI,IRDA,PFRDA, Corporate Governance and SEBI Role of central bank and commercial banks. Commercial Banking : Role of Banks, NPA, Risk Management in Banks, Basel Norms, Products offered by Banks and FIs: Retail banking and corporate banking products. Universal Banking: need and importance, trends and RBI guidelines, Core banking solution (CBS); RTGS and internet banking, CAMELS rating system, Basel Norms, MCLR based lending NBFCs and its types; comparison between Banks and NBFCs.

UNIT-3 **Financial Markets in India:**

Introduction to Financial Markets in India: Role and Importance of Financial Markets, Types of Financial Markets: Money Market; Capital Market; Factors affecting Financial Markets, Linkages Between Economy and Financial Markets, Integration of Indian Financial Markets with Global Financial Markets, Mutual Fund: types of Mutual Funds and different types of schemes, concept of NAV, Credit Rating Agencies : Role and mechanism, Merchant Bank: role and types, Venture Capital Funds concept, stages of investment , exit options; Private Equity. Foreign Exchange Market: Foreign Exchange Market (Introductory, only Conceptual)

UNIT-4**Capital Market in India:**

Introduction to Stock Markets, Regional and Modern Stock Exchanges, International Stock Exchanges, Demutualization of exchanges, Comparison between NSE and BSE, Primary and Secondary market, Raising of funds in International Markets: ADRs and GDRs, FCCB and Euro Issues; Indian Stock Indices and their construction, maintenance, adjustment for corporate actions (rights, bonus and stock split;)

UNIT-5 **Money Markets & Debt Markets in India:**

Money Market: Meaning, role and participants in money markets, Segments of money markets, Call Money Markets, Repos and reverse Repo concepts, Treasury Bill Markets, Market for Commercial Paper, Commercial Bills and Certificate of Deposit.

Debt Market: Introduction and meaning, Primary Market for Corporate Securities in India: Issue of Corporate Securities, Market for Government/Debt Securities in India, Secondary market for government/debt securities, Over subscription and devolvement of Government Securities, Government securities issued by State Governments, Municipal Bonds, Corporate Bonds vs. Government Bonds.

References:

Pathak, B. Indian Financial System (4th ed). Pearson Publication [Chapter 10]

Saunders, A. & Cornett, M.M. Financial Markets and Institutions (3rd Ed). Tata McGraw Hill. [chapter 5,6]

DEAN

B.COM

International Tax and Regulations

19161DSC55F

Objectives:

Legal Regime of tax encompasses the policies, laws and rules for taxation process. Income Tax law is concerned with the tax imposed on various sources of income.

Course Outcomes:

The students who complete the course will be able to

1. Acquire knowledge about the tax regime of India
2. Explain the fundamental concepts of income tax law.
3. Employ a broad understanding of tax law.

UNIT-I:

General Concept of tax- nature and characteristics of different types of taxes- direct and indirect taxes distinction between tax and fees, tax and cess-tax evasion, Tax Planning and tax avoidance Retrospective taxation- Federal base of taxing power- power of taxation under the Constitution. Immunity of state agencies/ instrumentalities- fundamental rights and the power of taxation Commerce Clause. Inter-state commerce and taxation, scope of taxing powers of Parliament, delegation of taxing power to state Legislatures and Local Bodies.

UNIT-II:

Direct Tax Regime The Income Tax Act 1961: Basis of taxation if Income-Basic concept, Person, Residential Status and incidence of tax, Income from salaries-Income from House Property -Income from Business or profession and vacation-Capital gains, Income from other sources-Deemed assesse. Set off and carry forward Loss; Income exempt from tax, permissible deductions & Chapter VIA deductions, Assessment, Kids of assessment, Income tax authorities- Appointment –power and functions, Provisions relating to collection and recovery of tax-filling of returns, electronic filling, I.T. Portal working Refund of tax, appeal and revision provisions, offences and penalties.

UNIT-IV:

Indirect Tax Regime IGST- Integrated GST (IGST) levied by the Central Government. Inter-state transactions and imported goods or services-State GST (SGST); The State Goods & Service tax Law, Power of Central government to levy tax on Interstate taxable supply, Impact of GST on State revenue; Indemnifying State Revenue Loss; UTGST-Union Securities, Securities Transaction Tax (STT).

UNIT-V:

Custom Law Legislative Background of the levy-ports-warehouse-Nature and restrictions on exports and imports- Levy, exemption and collection of customs, duties and overview of law and procedure Clearance of goods from the port, including baggage-Goods imported or exported by post and stores and goods in transit-Duty drawbacks provisions, Authorities Power and functions and SEZ Units.

Reference Books/Website/Portals:

1. Arvind P Datar, Kanga and Palkhivala's The Law and Practice of Income Tax, (LexisNexis, Nagpur, 10th edn., 2014).
2. Sampath Iyengar's, Law of Income Tax, (Bharat Law House Pvt.Ltd., New Delhi, 11th edn., 2011).
3. Income-Tax Act,1961 and Income –Tax Rules,1962 as amended by latest Finance Act, 2016-1

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HOD

Micro Finance
20198DSC64C

Objectives:
The main objective of microfinance is to bring a business under the ambit of conventional bank finance and eventually improve its reach.

Course Outcome:
Demonstrate the nature and principles of microfinance, including the characteristics of microfinance institutions, the principles that guide their operations and the impact of microfinance in promoting financial inclusion and women empowerment.

UNIT-1
Nature and principles of Microfinance
Meaning, nature and scope of Financial Services
- Meaning/ concept, objectives and role of Microfinance, especially in the context of Indian economy
- History of Microfinance in India – SEWA and SEWA Bank, Bandhan and Bandhan Bank
- Overview of Atal Pension Yojana, Pradhan Mantri Jan Dhan Yojana and Jan Dhan Accounts
- Regulatory framework of Microfinance - various microfinance regulations, standard code of conduct, and self-regulatory associations such as Microfinance Institutions Network (MFIN) and Sa-Dhan (The Association of Community Development Finance Institutions)

UNIT-2
Microfinance products and sources of Microfinance customers

Types and features of the products and services offered by Microfinance Institutions (MFI)
- Types of deposit products, and risks associated with them
- Types and features of different types of loans – retail loans, MSME loans, Agri loans, micro loans, etc.
- Segregation of customers depending upon the nature of products offered – who can avail of these products
- Different practices to source the customers with respect to the area assigned to a Microfinance Operative
- Importance of demographic segmentation – income, age, culture and social background and group dynamics of the customers

UNIT-3
Application process and KYC
Procedure of application for microfinance
- Regulatory system that governs banks and their impact on procedures
- List of documents required as under KYC Norms, acceptable options of identity & address proof, supporting documents required and other identification procedures
- Process of obtaining and processing requisite documents
- Verification criteria for KYC documents

UNIT-4

Microfinance Loans – disbursement, collection of receivables and follow-up

Process of loan sanction and disbursement

- Regulatory system that governs banks and their impact on procedures
- Layout and components of the microfinance loan application form
- Concept of credit rating and factors affecting creditworthiness of the customers
- Verification procedure of credit check report
- Estimation of loan amounts, tenure, and propensity to pay
- Concepts relating to interest rates, profit & loss, principal and maturity amount

UNIT-5

Other Microfinance Products

Meaning, nature and objectives of micro insurance

- Causes and types of risks
- Concept of insurable risk and principles of insurance
- Regulatory framework relating to insurance with reference to micro insurance under the Insurance Regulatory and Development Authority of India (Micro Insurance) Regulations, 2015
- Micro insurance agent – appointment, eligibility, maximum limit

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B.COM CA

Enterprise Resource Planning

20198DSC64D

Objective:

In this course students shall learn various components of an application software that help computerize functioning of an enterprise such as sales, materials, production, financial , customer relationship AND supply chain modules.

Course outcomes:

Comprehend the risks & benefits associated with implementing enterprise systems in an organizations.

UNIT-I

A Foundation for Understanding Enterprise Resource Planning systems – Reengineering and Enterprise Resource Planning Systems – Planning ,Design ,and Implementation of Enterprise Resource Planning Systems – ERP Systems: Sales and Marketing – ERP Systems: Accounting and finance ERP Systems : Production and Materials Management ERP Systems: Human Resources.

UNIT-II

Managing an ERP Project – Supply chain Management and the marketplace – Rules of the game – Winning as a team. UNIT-III Solutions - Supply chains as Systems - Modeling the Supply Chain – Supply Chain Software - Operations – Meeting Demand – Maintaining Supply – Measuring Performance

UNIT-IV

Planning – Forecasting Demand – Scheduling Supply – Improving performance – Mastering Demand – Designing the Chain – Maximizing Performance 4

UNIT-V

Essentials of Customer relationship management – Designing CRM application – Various modules of CRM application - Advantages of CRM

TEXT BOOK: 1. Sumner Mary, Enterprise Resource Planning, First edition, Pearson education, 2006 (ISBN 81-317-0240-5) (Unit 1: Chapters 1 to 7; Unit 2: Chapters 8, 9 (continued on text book number TWO)

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Regulations of Insurance Business

20198DSC64E

OBJECTIVES:

Its aim is to reduce financial uncertainty and make accidental loss manageable. It does this substituting payment of a small, known fee—an insurance premium—to a professional insurer in exchange for the assumption of the risk a large loss, and a promise to pay in the event of such a loss.

COURSE OUTCOME:

In the insurance sector, regulatory compliance and standards ensure that companies operate within legal frameworks and adhere to established industry norms, safeguarding the interests of policyholders and maintaining market stability

UNIT-1

Development of Insurance Legislation in India and Insurance Act 1938- IRDA Functions and Insurance Councils- IRDA and its Licensing Functions.

UNIT-2

Regulations on Conduct of Business- Policyholder's Rights of Assignment, Nomination and Transfer. Insurance Legislation in India : A brief study of Insurance Act1938,L.I.C.Act1956,Role of Insurance Development and Regulatory Authority (IRDA) of India1999-Amendments-2000 -2002 and Consumer Protection Act-Ombudsman.

UNIT-3

Protection of Policyholder's Interest- Dispute Resolution Mechanism- Financial Regulatory Aspects of Solvency Margin and Investments.

UNIT-4

International Trends in Insurance Regulation- Life Insurance Risk : Meaning Underwriting, Classification of risk-Physical ,Occupational and Moral, Financial underwriting-Data for underwriting Assessing the risk Non-medical underwriting –Female Lives-underwriting by agent-Recent trends-Premium-Risk-Net-Gross-Level and extra-premium calculation-Life Fund, Actuarial valuation and Bonus.

UNIT-5

Settlement of Claims : Procedure of settlement of claim-Calculation of Claim, Early claims- Time bar claims-claim Concessions-presumption of death, accident and disability benefits.

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B.COM CA

Financial Economics

20198DSC64F

OBJECTIVES:

Financial economics also studies risks and identifies ways to minimize investment-related risks.

Outcomes:

Financial outcomes are related to wealth creation and are the ultimate goal for earning an income. Financial outcomes are legacy-based.

UNIT-1

Consumer Behaviour and Demand Consumer preferences, opportunity sets, optimum choices, indirect utility demand functions, income and substitution effects, Slutsky equation, normal versus inferior goods, types of demand functions, elasticity, welfare evaluation, consumer surplus, equivalent variation and compensating variation, revealed preference (weak and strong axioms)

UNIT-2

Utility Functions and Expected Utility Theorem Expected utility function, measures of risk aversion, state-preference approach, portfolio theory and pricing of risk, present discounted value approach to investment decisions, adjustments for risk.

UNIT-3

National Income Accounting Accounting structure, key concepts in accounting for both closed and open economies – gross national product, gross domestic product, net national product, national income, savings and investment, balance of payments, circular flow of income, computational problems – expenditure approach, income approach and value added approach for measurement, input-output tables

UNIT-4

Probability Theory Concept of probability, conditional probability and Bayes' theorem, random variables – discrete and continuous, density and distribution functions, joint, marginal and conditional distribution, moment generating function, law of large numbers and Central Limit theorem.

UNIT-5

Sampling Methods and Sampling distributions Simple random sampling: with and without replacement, stratified random sampling, probability and non-probability sampling, statistic and sample moments, sampling distributions: Student's-t, Chi-square and F-distribution, determinants of sample size

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M.Com

Integrated Marketing Communication

19261DSC34C

Objectives:

The goal of integrated marketing communications is to ensure that customers receive the same message when they interact with a company's brand in various ways.

Course outcome:

Integrated Marketing Communication is crucial because it helps your brand stand out in a crowded market. By synchronizing your marketing efforts Integrated Marketing Communication ensures your message reaches your audience consistently across multiple channels, making your brand more memorable and trustworthy.

UNIT-1

Introduction to Integrated Marketing Communication (IMC): Evolution of Integrated Marketing Communication, Role of IMC in creating brand identity, brand equity, and customer franchise, Communication process, Promotional Mix: Tools for IMC, The IMC Planning Process, The Value of IMC plans – information technology, changes in channel power, increase in competition, brand parity, integration of information, decline in the effectiveness of mass-media advertising.

UNIT-2

Advertising- I: (a) Definition, History, Roles and Functions of Advertising, Types of Advertising, Steps in Development of Advertisement. (b) Advertising Design: Appeals, Message Strategies & Execution Framework: Advertising Design, Advertising Theory, Types of Advertising Appeals, Structure of an Advertisement, Message Strategies, Cognitive strategies, Execution Strategies, Creating an Advertising, Advertising Effectiveness. (c) Copywriting: Meaning and Definition of Copywriting, the Copywriter, Copywriting for Print, Copywriting guidelines, Radio Copywriting, TV Copywriting, Writing for the Web, Tips for writing good web content.

UNIT-3

Advertising- II: (a) Media Planning and Strategies: Growth and Importance of Media, Meaning and Role of Media Planning, Media Plan, Market Analysis, Media Objectives, Developing and Implementing Media Strategies, Evaluating the effectiveness. (b) Print Media and Outdoor media: Characteristics of the press, Basic media concepts, Newspapers, Magazines, Factors to consider for magazine advertising, Packaging, Out-of-home Advertising, Directory Advertising. (c) Broadcast and Internet Media: Meaning of Broadcast Media, Radio as Medium, Television as Medium, Internet Advertising, Email Advertising.

UNIT-4

Sales Promotion: Scope and Role of Sales Promotion, Growth of Sales Promotion, Consumer Oriented Sales-Promotion, Techniques in Sales Promotion, Trade Oriented Sales Promotion, Coordinating sales promotion and advertising; Sales promotion abuse; Personal selling.

UNIT-5

Public Relations, Publicity and Corporate Advertising: Definition of Public Relations, Publicity and Corporate Advertising; Difference between public relations and advertising, Functions of Public Relations; Creating positive image building activities; Preventing or reducing image damage; Sponsorship and Event marketing; Role of internet in Public Relations, Publicity, Advantages and Disadvantages of Publicity.

M.Com

Corporate Communication and Advertising

19261DSC44C

OBJECTIVES:

While internal teams work to synergize communication within the company, external communication teams are concerned about messaging disseminated to audiences outside the company. The primary goal of corporate communications is to ensure that communication materials transmit the company's brand in a favorable manner.

COURSE OUTCOME:

Corporate communication integrates traditional Public Relations and marketing communication to build, maintain and protect a company's reputation with its stakeholders as well as to consolidate and push sales.

Unit I

[Understanding Organizational Communication]

1. Defining structure of an organization
2. Various kinds of organizations
3. Management hierarchy
4. Various kinds of communication in an organization
5. Role and scope of corporate communication
6. Interface of corporate communication department with various management discipline

Unit II

[Understanding Corporate Communication]

1. Definitions, concept and genesis of CC
2. Difference and similarities between PR and CC
3. CC and public affairs, CC and corporate affairs
4. Publics in CC - Financial publics, media, opinion makers, government, elected representatives
5. Present state of CC
6. Organizing corporate communication activities
7. Areas of strategic thinking in corporate communication
8. Ethics and laws in corporate communication

Unit III

[Corporate Communication Tools]

1. Lobbying
2. Sponsorship
3. Financial communication
4. Corporate reputation
5. Corporate identity
6. Media mileage

Unit IV

[Financial Communication]

1. Defining financial communication
2. Growth and role of financial communication in present context
3. Overview of Indian financial system
4. Capital market – stock exchanges, SEBI- functioning and mandate
5. Financial institutions
6. financial products (bonds,' debentures, shares, esops et al)
7. Legal and ethical aspects in financial communication
8. Financial communication campaigns

Unit V

[Introduction to Advertising]

1. Definition, concept, nature and scope
2. Pioneers in advertising in India and across the globe
3. Types of advertising and innovations
4. Advertising as a communication process: Stern's model of advertising communication
5. Theories in advertising (CPT, circus theory, the laundry metaphor)
6. Institutional/Corporate advertising

Suggested Readings:

aishri Jethwaney & Shruti Jain Advertising Management, Oxford University Press
Batra Myers and Aaker Advertising Management, Printice Hall, New Delhi
Tom Means Business communication,
Thomson 4 Pitman Jackson Corporate Communication for Managers,
Pitman Publishing 5 Paul Argenti Paul
The Power of Corporate Communication, NY: McGraw Hill

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2021-2022

VALUE ADDED NEW DIPLOMA AND CERTIFICATE COURSE SYLLABUS

Academic year: 2021-2022
Course: Certificate course in Online Trading
Subject Code: 2161COT

AIM:

It allows investors to buy and sell financial instruments from the comfort of their homes or offices, offering convenience and flexibility.

OBJECTIVES:

- To familiarize the students to the concept of Online Trading
- To emphasis the concept of efficient market
- To understand the latest developments in online trading

OUTCOMES:

- Online trading often has lower brokerage fees and commissions compared to traditional offline trading methods.
- This can result in cost savings for investors.
- Online traders have access to real-time market information, research tools, and financial data

UNIT -I

Primary Market

Initial Public Offer (IPO) – Introduction

UNIT- II

Secondary Market

Role and Functions of

- Securities and Exchange Board of India (SEBI),
- Stock Exchanges,
- Stock Price Indices,

UNIT- III

Trading

- Logging on
- Log Off/Exit from the Application
- Invoking An Inquiry Screen
- Market Watch
- Previous Trades
- Outstanding Orders
- Activity Log
- Order Status
- Market Movement

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UNIT- IV

Methodology

- Fundamental Analysis
- Technical Analysis

UNIT- V

Strategies

- Investment Strategies
- Swing Trading Strategies
- Day Trading Strategies

REFERENCE:

Cadot, O., Diadier, A.-C. and Fontagné, L. (2010), "North-South Standards Harmonization and International Trade", Centre for Economic Policy Research, London, Discussion Paper 8767. Cadot, O., Malouche, M. and Saez, S. (2012), Streamlining Non-Tariff Measures:
A Toolkit for Policymakers, Washington, D.C., World Bank. Caliggi, F. and Janczuk, A. (2018), "Private Regulation and Legal Integration:
The European Example", Business and Politics 12(3): 1-40. Carpenter, D. P. (2004), "Protection without Capture: Product Approval by a Politically Responsive, Learning Regulator", American Political Science Review 98(04): 613-631.
Casella, A. (2001), "Product Standards and International Trade: Harmonization through Private Coalitions?", Kyklos 54(2-3): 243-264. Cashore, B. (2002),
"Legitimacy and the Privatization of Environmental Governance: How Non-State Market-Driven (NSMD) Governance Systems Gain Rule-Making Authority", Governance: An International Journal of Policy, Administration,

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Academic year: 2021-2022

Course: Certificate course In Knowledge Management

Subject Code: 2161CKM

AIMS:

The purpose of the Knowledge Management process is to share perspectives, ideas, experience and information.

COURSE OBJECTIVES:

- To provide basic knowledge about the Growth and Role of knowledge management
- To provide knowledge on understanding managing human resources in organization
- and to provide an exposure on the knowledge management tools

OUTCOMES:

- Intellectual Skills.
- Cognitive Skills Development.
- Knowledge Sharing.
- Motor Skill Development.
- Individual's Personal Growth.

UNIT- I

Knowledge Economy – Technology and Knowledge Management – Knowledge Management Matrix – Knowledge Management Strategy – Prioritizing knowledge strategies – knowledge as a strategic asset.

UNIT -II

Knowledge Attributes – Fundamentals of knowledge formation – Tacit and Explicit knowledge- Knowledge sourcing, abstraction, conversion and diffusion

UNIT- III

Knowledge Management and organizational learning, architecture – important considerations – collection and codification of knowledge – Repositories, structure and life cycle – Knowledge Management infrastructure – Knowledge Management applications – Collaborative platforms

UNIT- IV

Developing and sustaining knowledge culture – Knowledge culture enablers – implementing knowledge culture enhancement programs – Communities of practice – Developing organizational memory.

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UNIT -V

Knowledge Management tools, techniques – Knowledge Management and measurements – Knowledge audit – Knowledge careers – Practical implementation of Knowledge management systems – Case studies

Book Reference:

1. Joseph M. Firestone and Mark W. McElroy, Butterworth – Heinemann, Key issues in the New Knowledge Management, KMCI Press
2. Daryl Morey & others Knowledge Management – Classic and contemporary works (Edited) Universities Press India Limited
3. Sheida Debowski, Knowledge Management, , John Wiley & Sons
4. Sudhir Warier, Knowledge Management, Vikas Publishing House Private Limited
5. Stwart Barnes Knowledge Management System Theory and practice (Edited) Thomson Learning
6. Hof Sapple Springer C W, Handbook on knowledge management (Edited

Web References:

www.knowledge-management-online.com
www.systems-thinking.org www.kmworld.com
www.knowledge-management-tools.ne

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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 04.06..2021 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.Mohanraj /Associate Professor, (BOS, Member)
5. Dr. T. Ushadevi/ Associate Professor PRIST (Member, BOS)
6. Dr. K. Sundar / Assistant Professor, PRIST (Member, BOS)
7. Dr. R. Sathya/Assistant Professor, PRIST (Member, BOS)
8. Dr.A.Xavier Fernandes /Assistant Professor, PRIST (Member, BOS)
9. Dr. P. Anantharaman Professor, CAS in Marine Biology, Annamalai University (External Member, BOS)
10. Dr. Rajkumar, Managing Director, Cell Zyme Biotech, Chennai, External Member, BOS)

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

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

Resolved to introduce the following New Discipline elective Courses in the B.Sc., (Microbiology) programme curriculum with effect from 2021-2022

I To improve the skill development in Microbiology

S.No	Course Code	Course Name	Year of introduce
1.	20116DSC54C	Molecular Immunology	2021
2.	20116DSC54D	Algae Biotechnology	2021
3.	20116DSC63C	Microbiome	2021
4.	20116DSC63D	Tissue Culture	2021
5.	20116DSC63E	Nanotechnology	2021

II. To improve the Value-added course

S.No	Name of the Course	Course code	Year of introduce
1.	Diploma in Air Pollution & Control	21516APC	2021
2.	Certificate Course on Applied Environmental Microbiology	21516AEM	2021
3.	Diploma in Biomedical Research	21516BMS	2021
4.	Certificate Course on Biofertilizer Production Technology	22516BPT	2021
5.	Certificate Course on Hygiene & Life	22516HL	2021

The Meeting concluded with thanks from the Board of Studies Chairman.

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Composition of Board of Studies 2021-2022					
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.Mohanraj	M.Sc.,Ph.D.	Associate Professor, PRIST Deemed to be University, Vallam, Thanjavur	sundar@prist.ac.in
6	Associate Professor	Dr. T. Usharadevi	M.Sc., M.Phil., B. Ed., Ph.D.	Associate Professor, PRIST Deemed to be University, Vallam, Thanjavur	usharadevi29@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	sathyaram1984@gmail.com
9	Assistant Professor	Dr.A.Xavier Fernande	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	T.Krishnaveni	PG	Student, PRIST Deemed to be University, Vallam, Thanjavur	anjali@gmail.com
12	Special Invitee -Current student - UG or PG	S. Sandhiya	UG	Student	sandiya1920@gmail.com

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Head of the Department
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School of Arts & Science
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Signature of the Chairman & Members

No	Designation	Name	Signature
1	Chairperson/HoD	Dr.A.Bakrudeen 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. Sathya	
9	Assistant Professor	Dr.A.Xavier Fernandes	
10	Special Invitee-Dean	DR. L.Chinnappa	
11	Special Invitee-Alumnus/Alumna	T.Krishnaveni	
12	Special Invitee -Current student - UG or PG	S. Sandhiya	

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Course Code	Course Title	L	T	P	C
20116DSC54BC	Molecular Immunology	4	1	0	3

OUTCOME:

CO1- Theory linked to cells and organs related to the immune system.

CO2- Able to know Immune response and immune mechanism.

CO3 - Concept of central dogma of the cell and gene regulation.

CO3 - Principles and applications of various molecular techniques

Unit – I

Introduction: History of immunology – types of immunity – Innate and Acquired – Passive and Active - Humoral and cell Mediated Immunity. Lymphoid organs – autoimmunity, physiology of immune response — Immunohaematology

Unit - II

Antigens and Antibodies: Antigens – structure and properties – types – ISO and allo –haptons; adjuvants – antigen specificity, vaccines and toxoids. Immunoglobulins – structure - theories of antibody production - Complement properties and functions of complement components;

Unit - III

Major Histocompatibility complex- Gene regulation and Ir – genes. HLA tissue and transplantation – tissue typing methods for organ and tissue transplantation in humans; Graft versus host reaction and rejection. Autoimmunity –diseases-mechanism and disease with their diagnosis

Unit - IV

Tumor Immunology: tumour antigens – immune response to tumors immunodiagnosis of tumors – Immunotherapy of malignancy, Hypersensitivity – monoclonal antibody – production and their applications

Unit - V

Immunological techniques and their principles: In vitro of immunological methods – agglutination, precipitation, complement fixation, Immunolfluorescence, ELISA, Radio Immuno Assays.

Text Books

S. No	Author Name	Title of the Paper	Edition/year	Publication
1.	Ivaitt Roitt, Jonathan Brostoff, David Male	Immunology	3rd/1993	Mosby Inc, St. Louis, MO
2.	R.A. Goldsby, T. J. Kindt, B.A. Osborne, J. Kuby	Immunology	5th/2003	W.H. Freeman and Company

Course Code	Course Title	L	T	P	C
20116DSC54D	Algae Biotechnology	4	1	0	3

AIM

To understand the gene and its role in genetic engineering aspects

OBJECTIVES

- To learn the basic principles of nucleic acid and recombinant technology.
- To understand the relationships between molecule/cell level phenomena.
- Studying the concepts and mechanism of central dogma.

COURSE OUTCOME

CO1 Characterize the different groups of algae.

CO2 Describe the cultivation and harvesting of algae.

CO3 Identify the commercial applications of various algal products.

CO4 Apply microalgae for environmental applications.

CO5 Employ microalgae as alternate fuels.

UNIT I:

Introduction to Algae - General characteristics. Classification of algae according to Fritsch. Salient features of different groups of algae. Distribution - Freshwater, brackish water and marine algae. Identification methods. An overview of applied Phycology. Economically important microalgae.

UNIT II:

Cultivation of freshwater and marine microalgae - Growth media. Isolation and enumeration of microalgae. Laboratory cultivation and maintenance. - Harvesting of microalgae biomass.

UNIT III:

Microalgae in food and nutraceutical applications - Algal single cell proteins. Cultivation of Spirulina and Dunaliella. Microalgae as aquatic, poultry and cattle feed. Microalgal biofertilizers. Value-added products from microalgae.

UNIT IV:

Microalgae in environmental applications. Phycoremediation - Domestic and industrial waste water treatment. High-rate algal ponds and surface-immobilized systems - Treatment of gaseous wastes by microalgae.

UNIT V:

Microalgae as feed stock for production of biofuels - Carbon-neutral fuels. Lipid-rich algal strains - Botryococcus braunii. Drop-in fuels from algae - hydrocarbons and biodiesel, bioethanol, biomethane, biohydrogen and syngas from microalgae biomass.

Text Books:

1. Benjamin, L (1990). Gene. IV Edn. Oxford Univ. Press, Oxford.

Course Code	Course Title	L	T	P	C
20116DSC63C	Microbiome	4	1	0	3

CO1-Introduction to the Human Microbiome
CO2-How the Microbiome is Studied
CO3- The Human Gut Microbes
CO4-Modification of the Microbiome
CO5- Functional Studies of the Microbiome

Unit -I

Overview of course; format, readings, syllabus, grading - Description of the bacteria, archaea, viruses, fungi and Protists that comprise the microbiome. The human microbiome, composition at various sites in health. Source of the organisms in the human microbiome. Ecological concepts of disease *eg*. dysbiosis.

Unit -II

DNA-based analysis of microbial communities, 16S rRNA gene amplicon sequencing and shotgun metagenomics sequencing methods. - Functional analysis of the microbiome from DNA sequence functional analysis, metatranscriptome, metabolome, proteome, and glycome.

Unit -III

Composition and function along the GI tract eg., stomach, ileum and stool. Gut microbiome changes in various diseases including liver diseases, obesity, diabetes, and other disorders. Effects of diet and medications on the gut microbiome.

Unit -IV

Effects of antibiotics. Probiotics and prebiotics. Fecal transplant. Future strategies to modify the microbiome at various sites.

Unit -V

Measurement of microbial products (the metabolome, proteome and glycome) Role of microbiome and its products, nutrition, metabolism, the gut brain axis, and in immune-inflammatory processing.

Course Code	Course Title	L	T	P	C
20116DSC63D	Tissue Culture	4	1	0	3

OUTCOMES

- To know the basic technique of tissue cultures
- To produce new plants through this tissue culture
- To gain knowledge about tissue culture in crop improvements.
- To know the applications of tissue culture in various fields.

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.

Unit II

Cell, tissue and organ culture - 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 - Organogenesis - 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 - Protoplast culture -Protoplastfusion - spontaneous, mechanical, induced electrofusion, selection of somatic hybrids, cybrids, importance.

Unit V

Cryopreservation and gene bank - 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. Hammoond, 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.

Course Code	Course Title	L	T	P	C
20116DSC63E	Nanotechnology	4	1	0	3

Aim

To understand about nanotechnology principles and its applications

Objective:

To gain knowledge about Nanotechnology and its commercial promise

Outcomes:

To understand the basic principles and method of Nanotechnology

To know the applications of Nanotechnology

To understand the groundbreaking innovations in medicine and medical implants, environment and other field

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

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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.
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SCHOOL OF ARTS AND SCIENCE
DEPARTMENT OF MICROBIOLOGY
B. Sc., MICROBIOLOGY-REGULATION 2020
COURSE STRUCTURE - 2021-2022

SEMESTER I					
Course Code	**Course Title**	**L**	**T**	**P**	**C**
THEORY					
20110AEC11/ 20111AEC11/ 20132AEC11/ 20135AEC11	Language-I (Tamil-I/ Advanced English-I/ Hindi-I/ French-I	4	0	0	2
20111AEC12	English-I	4	0	0	2
20116AEC13	Fundamentals of Microbiology	6	1	0	5
20115AEC14B	Bio Chemistry I	6	1	0	4
PRACTICAL					
20116AEC15L	Fundamentals of Microbiology Lab	0	0	3	2
20115AEC16BL	Bio Chemistry I Lab	0	0	3	2
	Total	20	2	6	17
AUDIT COURSE					
201ACLSICN	Indian Constitution	-	-	-	2
201ACLSUHV	Universal Human Values	-	-	-	2
SEMESTER – II					
Course Code	**Course Title**	**L**	**T**	**P**	**C**
THEORY					
20110AEC21/ 20111AEC21/ 20132AEC21/ 20135AEC21	Language-II (Tamil-II/ Advanced English-II / Hindi-II/ French-II)	4	0	0	2
20111AEC22	English-II	4	0	0	2
20116AEC23	Microbial Physiology	6	1	0	5
20115AEC24	Bio Chemistry II	6	1	0	4
PRACTICAL					
20116AEC25L	Microbial Physiology Lab	0	0	3	2
20115AEC26L	Bio Chemistry II Lab	0	0	3	2
RESEARCH SKILL BASED COURSE					

20116RLC27	Research Led Seminar	-	-	-	1
	Total	**20**	**2**	**6**	**18**
	AUDIT COURSES				
201ACLSCOS	Communication Skills	-	-	-	**2**
201ACSSBBE	Basic Behavioral Etiquette	-	-	-	**2**
	SEMESTER – III				
Course Code	**Course Title**	**L**	**T**	**P**	**C**
	THEORY				
20110AEC31/ 20111AEC31/ 20132AEC31/ 20135AEC31	Language-III (Tamil-III/ Advanced English-III / Hindi-III/ French-III)	4	0	0	2
20111AEC32	English-III	4	0	0	2
20116AEC33	Immunology	4	1	0	4
20116AEC34	Cell Biology	4	1	0	5
	PRACTICAL				
20116AEC35L	Immunology Lab	0	0	3	2
20116AEC36L	Cell Biology Lab	0	0	3	2
	RESEARCH SKILL BASED COURSE				
20116RMC37	Research Methodology	2	0	0	2
	Total	**18**	**2**	**6**	**19**
	AUDIT COURSE				
201ACLSOAN	Office Automation	-	-	-	**2**
	SEMESTER – IV				
Course Code	**Course Title**	**L**	**T**	**P**	**C**
	THEORY				
20110AEC41/ 20111AEC41/ 20132AEC41/ 20135AEC41	Language-IV (Tamil-IV/ Advanced English-IV/ Hindi-IV/ French-IV)	4	0	0	2
20111AEC42	English-IV	4	0	0	2
20116AEC43	Virology	4	1	0	4

20116AEC44	Biostatistics and Bioinformatics	5	1	0	5
201ENSTU45	Environmental studies	2	0	0	2
	PRACTICAL				
20116AEC46L	Virology Lab	0	0	3	2
20116AEC47L	Biostatistics and Bioinformatics Lab	0	0	3	2
	Total	**19**	**2**	**6**	**19**
	AUDIT COURSE				
201ACLSLMS	Leadership and Management Skills	-	-	-	**2**
201ACSSAQA	General Aptitude and Quantitative Ability	-	-	-	**2**
	SEMESTER – V				
Course Code	**Course Title**	**L**	**T**	**P**	**C**
	THEORY				
20116AEC51	Food and Dairy Microbiology	4	1	0	4
20116AEC52	Molecular Biology	4	1	0	3
20116AEC53	Agricultural and Environmental Microbiology	4	1	0	4
20116DSC54__	Discipline Specific Elective -I	4	1	0	3
	PRACTICAL				
20116AEC55L	Food and Dairy Microbiology and Molecular Biology Lab	0	0	3	2
20116AEC56L	Agricultural and Environmental Microbiology Lab	0	0	3	2
	RESEARCH SKILL BASED COURSE				
20116BRC57	Participation in Bounded Research	-	-	-	1
	Total	**16**	**4**	**6**	**19**
	AUDIT COURSE				
201ACLSPSL	Professional Skills	-	-	-	**2**
	SEMESTER – VI				
Course Code	**Course Title**	**L**	**T**	**P**	**C**
	THEORY				

20116AEC61	Industrial Microbiology	4	1	0	4
20116SEC62	Clinical Microbiology	4	1	0	5
20116DSC63_	Discipline Specific Elective - II	4	1	0	3
201—OEC (2 DIGIT COURSE Name)	Open Elective	4	0	0	2
	PRACTICAL				
20116AEC64L	Industrial Microbiology Lab	0	0	3	2
20116SEC65L	Clinical Microbiology Lab	0	0	3	2
20116PRW66	Project Work	-	-	-	4
20116PROEE	Program Exit Examination	-	-	-	1
	Total	**16**	**3**	**6**	**23**
	AUDIT COURSE				
201ACSSIST	Interview Skills Training and Mock Test	-	-	-	2
201ACLSCET	Community Engagement	-	-	-	1
	Total Credits -Programme				115
	Total Credits - Audit Courses				19

Discipline Specific Electives

Semester	Discipline Specific Elective Courses-I
V	a) 20116DSC54A - Proteomics b) 20116DSC54B - Bioinoculants c) 20116DSC54C -Molecular Immunology d)20116DSC54D- Algae Biotechnology
	Discipline Specific Elective Courses-I
VI	a) 20116DSC63A-Recombinant DNA Technology b) 20116DSC63B - Bioethics c)20116DSC63C -Microbiome d)20116DSC63D-Tissue Culture e)20116DSC63E-Nanotechnology

Open Electives

Semester	Open Elective Courses
VI	a) 201TNOEC-Tamil Ilakkiya Varalaru b) 201ENOEC-Journalism c) 201MAOEC-Development of Mathematical Skills d) 201PHOEC-Instrumentation e) 201CEOEC-Food and Adulteration f) 201CSOEC – E-Learning g) 201CAOEC-Web Technology h) 201CMOEC-Banking service

Credit Distribution

Sem	AEC	SEC	DSC	OEC	Research	Others	Total
I	17	-	-	-	-	-	17
II	17	-	-	-	1	-	18
III	17	-	-	-	2	-	19
IV	17	-	-	-	-	2	19
V	15	-	3	-	1	-	19
VI	6	7	3	2	4	1	23
Total	89	7	6	2	8	3	115

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School of Arts and Science

Department of Microbiology

M. Sc., Syllabus-Regulation 2020

COURSE STRUCTURE - 2021-2022

Course Code	Course Title	L	T	P	C
	SEMESTER I				
20216SEC11	Prokaryotic Microbiology	6	1	0	5
20216SEC12	Eukaryotic Microbiology	6	1	0	5
20216SEC13	Microbial Physiology	6	1	0	4
20216SEC14L	Fundamentals of Microbiology Lab	0	0	4	2
20216DSC15	Discipline Specific Elective I	5	0	0	4
20216RLC16	Research Led Seminar	-	-	-	1
	Total	**23**	**3**	**4**	**21**
	SEMESTER II				
20216SEC21	Industrial Microbiology	5	1	0	5
20216SEC22	Environmental and Agricultural Microbiology	5	1	0	5
20216SEC23	Clinical Microbiology	5	0	0	4
20216SEC24L	Industrial, Clinical and Environmental and Agricultural Microbiology Lab	0	0	4	2
20216DSC25_	Discipline Specific Elective II	5	0	0	4
20216RMC26	Research Methodology	3	0	0	2
20216BRC27	Participation in Bounded Research	-	-	-	2
	Total	**23**	**2**	**4**	**24**
	SEMESTER III				
20216SEC31	Microbial Genetics	6	1	0	6
20216SEC32	Microbial Biotechnology	6	1	0	6
20216SEC33L	Microbial Genetics and Biotechnology Lab	0	0	5	3
20216DSC34_	Discipline Specific Elective III	5	0	0	4
202_OEC	Open Elective	4	0	0	4
20216SRC35	Design/Socio technical research	-	-	-	2
	Total	**21**	**2**	**5**	**24**
	SEMESTER IV				
20216SEC41	Pharmaceutical Microbiology	6	1	0	6
20216SEC42	Biostatistics and Bioinformatics	6	1	0	6
20216SEC43L	Pharmaceutical Microbiology Lab	0	0	5	3
20216SEC44_	Discipline Specific Elective IV	5	0	0	4

20216PRW45	Project Work	-	-	-	6
20216PEE	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) 20216DSC15A- Immunotechnology b) 20216DSC15B-Bioremediation and Waste Management
	Discipline specific Elective Courses-II
II	a) 20216DSC25A-Biomolecules b) 20216 DSC25B- Genomics and Proteomics
	Discipline specific Elective Courses-III
III	a) 20216DSC34A- Plant Tissue Culture b) 20216DSC34B-Nanotechnology
	Discipline specific Elective Courses-IV
IV	a) 20216DSC44A- Bioethics and IPR b) 20216DSC44B-Molecular Immunology

Open Electives

Semester	Open Elective Courses
III	a) 202ENOEC-Writing for the media b) 202MAOEC-Applicable Mathematics Techniques c) 202PHOEC-Bio-Medical Instrumentation d) 202CHOEC-Green Chemistry e) 202CSOEC – M-Marketing f) 202CMOEC- Financial Services

Credit Distribution:

Sem	SEC	DSC	GEC	RSB courses	Others	Total
I	16	4	-	1	-	21
II	16	4	-	4	-	24
III	15	4	3	2	-	24
IV	15	4	-	6	2	27
Total	**62**	**16**	**3**	**13**	**02**	**96**

HOD

DEAN

Head of the Department
Department of Microbiology
School of Arts & Science
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DEPARTMENT OF MICROBIOLOGY

M.PHIL MICROBIOLOGY SYLLABUS - REGULATION 2020

COURSE STRUCTURE - 2021-2022

SEMESTER - I					
COURSE CODE	**COURSE TITLE**	**L**	**T**	**P**	**C**
203___11 (Common Paper)	Research Methodology	2	2	0	2
203MBC12	Advanced Microbiology	2	2	0	2
203MBC13_	A. Microbial Biotechnology B .Bioprocess and Enzyme Engineering	2	2	0	2
CPE_RPE (Common Paper)	Research and Publication Ethics	2	2	0	2
	Total	08	08	00	08
SEMESTER – II					
203MBC21	Project Work				02

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Department of Microbiology
School of Arts & Science
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SCHOOL OF ARTS AND SCIENCE
DEPARTMENT OF MICROBIOLOGY

Value added course

ACADEMIC YEAR 2021-2022

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SCHOOL OF ARTS AND SCIENCE
DEPARTMENT OF MICROBIOLOGY
Certificate Course in Biofertilizer Production Technology

ACADEMIC YEAR 2021-2022
Subject Code: 22516BPT

Total: 45 hours

Course objectives:

To demonstrate the low cost media preparation and impart training of eco friendly agricultural inputs in biofertilizer production.

Course Outcomes:

- Ability to distinguish the types of biofertilizers and methods of application in farmers field
- Development of integrated management for best results using nitrogenous and phosphate biofertilizers.

Syllabus:

Unit I:

Introduction,History and concept of Bio fertilizers ,status scope and importance of Bio fertilizers,Classification of Bio fertilizers.Nitrogen fixation.

Unit II:

Structure and characteristic features of bacterial Bio fertilizers- Azospirillum, Azotobacter, Bacillus, Pseudomonas, Rhizobium and Frankia; Cynobacterial biofertilizers- Anabaena, Nostoc, Hapalosiphon and fungal biofertilizers- AM mycorrhiza and ectomycorhiza.

Unit III:

Production technology: Strain selection, sterilization, growth and fermentation,equipment, mass production of carrier based and liquid bio fertiizers. FCO specifications and quality control of bio fertilizers.

Unit IV:

Application technology for seeds, seedlings, tubers, sets etc.Biofertilizers -Storage, shelf life, quality control and marketing. Factors influencing the efficacy of bio fertilizers.

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SCHOOL OF ARTS AND SCIENCE
DEPARTMENT OF MICROBIOLOGY
Certificate Course in Hygiene & life

ACADEMIC YEAR 2021-2022
Subject Code: 22516HL

Total: 45 hours

Course objectives:

- To provide knowledge on different health indicators and types of hygiene methods
- To impart knowledge on different health care programmes taken up by India
- To make student understand the latest concepts of health such as HIA, EIA, SIA and SEA
- To enable student with disaster mitigation strategies

Course Outcomes:

On completion of this course, the students will be able to understand -

- What is a healthy diet
- How can we use available information to optimize our diet?
- Can nutrition be used for a healthy life?
- Is there a one-size-fits-all "good" diet or should we individualize our dietary goals?
- Awareness in public through digital media viz., mobile apps

Unit I: Basics of Nutrition

1. Nutrition – definition, importance, Good nutrition and malnutrition; Balanced Diet: Basics of Meal Planning
2. Carbohydrates –functions, dietary sources, effects of deficiency.
3. Lipids –functions, dietary sources,effects of deficiency.

Unit II: Health (9 Hrs)

4. Proteins –functions, dietary sources, effects of deficiency.
5. Brief account of Vitamins- functions, food sources,effects of deficiency,
6. Macro and micro minerals –functions, effects of deficiency; food sources of Calcium, Potassium and Sodium; food sources of Iron, Iodine and Zinc

Unit III: Health (9 Hrs)

7. Importance of water– functions, sources, requirements and effects of deficiency.

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8. Health - Determinants of health, Key Health Indicators, Environment health & Public health; Health-Education: Principles and Strategies

9. Health Policy & Health Organizations: Health Indicators and National Health Policy of Govt. of India-2017; Functioning of various nutrition and health organizations in India viz., NIN (National Institution of Nutrition), FNB (Food and Nutrition Board), ICMR (Indian Council of Medical Research), IDA (Indian Dietetics Association),WHO-India, UNICEF-India

Unit IV: Hygiene 10 Hrs.

10. National Health Mission: National Rural Health Mission (NRHM) Framework, National Urban Health Mission (NUHM) Framework

11. Women & Child Health Care Schemes: Reproductive, Maternal, Newborn, Child and Adolescent Health (RMNCH+); Janani Shishu Suraksha Karyakaram (JSSK); Rashtriya Bal Swasthya Karyakram(RBSK); India Newborn Action Plan (INAP); Adolecent Heatlh- Rashtriya Kishor Swasthya Karyakram (RKSK)

12. Disaster Management – Containment, Control and Prevention of Epidemics and Pandemics – Acts, Guidelines and Role of Government and Public

Unit IV: Hygiene 10 Hrs.

13. Hygiene – Definition; Personal, Community, Medical and Culinary hygiene; WASH (WAter, Sanitation and Hygiene) programme

14. Rural Community Health: Village health sanitation & Nutritional committee (Roles & Responsibilities); About Accredited Social Health Activist (ASHA); Village Health Nutrition Day, Rogi Kalyan Samitis

15. Community & Personal Hygiene: Environmental Sanitation and Sanitation in Public places

16. Public Awareness through Digital Media - An Introduction to Mobile Apps of Government of India: NHP, Swasth Bharat, No More Tension, Pradhan Mantri Surakshit Mantritva Abhiyan (PM Suman Yojana), My Hospital (Mera aspataal), India fights Dengue, JSK Helpline, Ayushman Bhava, Arogya Setu, Covid 19AP

REFERENCES

1. Bamji, M.S., K. Krishnaswamy & G.N.V. Brahmam (2009) Textbook of Human Nutrition(3rd edition) Oxford and IBH Publishing Co. Pvt. Ltd., New Delhi
2. Swaminathan (1995)Food & Nutrition(Vol I, Second Edition) The Bangalore Printing &Publishing Co Ltd., , Bangalore
3. Vijaya Khader (2000)Food, nutrition & health, Kalyan Publishers, New Delhi
4. Srilakshmi, B., (2010)Food Science, (5th Edition) New Age International Ltd., New Delhi

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Department of Microbiology
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SCHOOL OF ARTS AND SCIENCE

DEPARTMENT OF MICROBIOLOGY

Certificate Course on Applied Environmental Microbiology

ACADEMIC YEAR 2021-2022

Syllabus

Subject Code: 21516AEM

Total: 45 hours

AIM:

The advancement of our understanding of microbial interactions and microbial processes in the environment

Course objective:

Summarize and explain the roles of microbes in industrial and food processes. Relate their knowledge of traditional microbiological techniques to the utilization and control of microorganisms.

Course Outcome:

This course prepares the student to address pressing environmental challenges by developing a fundamental understanding of the microbial communities and processes in natural and built environments. It lays and builds upon the foundation of basic microbiology, microbial energetics and diversity to applying tools provided by microbiology ranging from traditional to state of art for addressing relevant environmental concerns. It provides an indepth exploration of the diverse role microbes and microbial communities and includes topics such as: cell structure and elements, microbial energetics and diversity, ecology and population dynamics, environmental microbial processes including biogeochemical cycling, and microbes involved in biodeterioration and bioremediation.

UNIT I(9Hr)

Introduction; cell elements and composition Cell and its composition, cytoplasmic membrane Prokaryotic cell division Microbes and their environmental niches Historical roots of microbiology Nucleic acids and amino acids DNA structure, replication, and manipulation Protein and its structure Regulation Microbial nutrition Microscopy: Light microscopy, 3D Imaging, AFM, Confocal scanning laser microscopy

UNIT II(9Hr)

Microbial ecosystems Population, guilds, and communities Environments and microenvironments Microbial growth on surfaces Environmental effects on microbial growth

UNIT III(9Hr)

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Microbial symbiosis and virus, Mutation and its rate, Genetic recombination, Population dynamics, Virus, Viroid, Prion, Application of environmental microbes

UNIT IV(9Hr)

Bioremediation and wastewater microbiology, Bioremediation and examples, Acid mine drainage, Enhanced metal recovery, Wastewater microbiology

UNIT V(9Hr)

Solid waste microbiology and antimicrobial resistance, Landfills, Leachate, Anaerobic degradation phases, antimicrobial resistance

References

1. Atlas Ronald M, Bartha Richard. Microbial Ecology 2nd Edition. Benjamin/Cummings Publishing Company, California. 1987.
2. Baker WC and Herson DS. Bioremediation – McGraw Hill Inc., New York. 1994.
3. Chatterji AK. Introduction to Environmental Biotechnology. 2005
4. Christon J Hurst, Manual of Environmental Microbiology.2nd edition. American Society for Microbiology, Washington. 2002.

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Department of Microbiology
School of Arts & Science
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SCHOOL OF ARTS AND SCIENCE

DEPARTMENT OF MICROBIOLOGY

Diploma in Air Pollution & Control

ACADEMIC YEAR 2021-2022

Syllabus

Subject Code: 21516APC

Total: 45 hours

COURSE OBJECTIVES

Learn the fundamental knowledge of air pollution source, primary and secondary air pollutants; as well as, their effects on environment and human health

Learn the methods used to measure and estimate the emissions from stationary (e.g. factory) and mobile (e.g. cars) sources.

Differentiate between the general and modern techniques used to control and reduce the amount of gaseous emissions in the atmosphere.

COURSE OUTCOMES

- Define air pollution & list its sources.
- Interpret the effect of each pollutant on human health and the environment.
- Detect & measure the extent of pollution in the atmosphere.
- Apply & conclude the best and suitable technology for controlling any kind of gaseous & particulate matter emissions
- Control hydrocarbon and VOC emissions through using the incineration or after burning techniques.

COURSE CONTENT

- Introduction and common air pollutants
- Health and environment impacts
- Air pollution measurements
- General ideas of air pollution control
- Gaseous emission control
- Particulate Control Indoor air quality
- Regional and Global IssuesImpact of Air Pollution on Atmosphere
- Soil and Water Bodies.
- Sources and Classification of Air Pollutants.
- Atmospheric Formation and Fate of Air Pollutants.
- Meteorological Parameters & Air Pollution.
- Atmospheric Stability and Lapse Rates.

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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

BOARD OF STUDIES

CIRCULAR & MINUTES OF MEETING
2021-2022

BOARD OF STUDIES MEETING

CIRCULAR

19.07.2021

The BOS Meeting is scheduled on 26.07.2021 at 10.30 am in the Gallery Hall of 'A' Block at PRIST Deemed to be University-Vallam,Campus under the Chairmanship of Prof.Dr. 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 newlyadded 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 of B.Tech (FT).

HOD/ EEE

Head of the Department
Electrical and Electronics Engineering
Ponnaiyah Ramajayam Institute of
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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	18
Date and Time	26.07.2021 @ 10.30 am
Venue	Gallery Hall, 'A' Block
Members Attended	The details are given in the ANNEXURE-I

	AGENDA
1.	To confirm the minutes of the previous meetings.
2.	To discuss the action taken on the previous meeting minutes.
3.	To scrutinize the stakeholders feedback on B.Tech (FT).
4.	To introduce the syllabus contents of newly added 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) 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 was 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 stakeholder's feedback on existing curriculum and syllabi for B.Tech (FT).
Resolution:The members of the Board thoroughly scrutinized the existing curriculum and syllabi and the abstract of stakeholders feedback on B.Tech (FT).and resolved to continue with the existing syllabus.
Agendum 3: Introduction newly added courses.
Discussion: To introduce the syllabus content for the following newly added courses.
Resolution: The members of the Board scrutinized the syllabus contents of newly added courses and resolved to introduce the same.
Agendum 4: Introduction newly added Value added courses.
Discussion: To introduce the syllabus content for the following newly added value added courses.
Resolution: The members of the Board scrutinized the syllabus contents of newly added value added courses and resolved to introduce the same.
Agendum 5: Discuss the Programme Educational Objectives (PEOs), Programme Outcomes (POs) and Programme Specific Outcomes (PSOs) B.Tech (FT).
Discussion:To discuss upon the Programme Educational Objectives (PEOs), Programme Outcomes (POs) and Programme Specific Outcomes (PSOs) of B.Tech (FT).

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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 sameforB.Tech (FT).
Agendum 6:Recommend the panel of Examiners forB.Tech (FT).
Discussion:To recommend the panel of Examiners forB.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.

Date:

Signature
(BOS Chairman Name)

BOS Chairman/HOD Seal

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ANNEXURE-I

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

Date:26.07.2021

Time: 10.30 am

Venue: Gallery Hall, 'A' Block

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

S.No.	Name/Degree/Designation	Institute/Organization/ Full address	Online/ Physical	Signature
1.	Prof. Dr.P.Avirajamanjula Chairman	Dept of EEE, PRIST DU	Physical	
2.	Dr.T.S.Ananthi, Associate Professor,Annamalai university External Members	Annamalai university. Chennai	Physical	
3.	Dr.R.Sambath, AEE/TNEB, External Members	AEE / TNEB, 230KV SS, Thirukanurpatti, Vallam, Thanjavur.	Physical	
4.	Dr.P.Ramachandran-Professor,	Dept of EEE, PRIST DU	Physical	
5.	B.KUNJITHAPATHAM Associate Professor	Dept of EEE, PRIST DU	Physical	
6.	Dr.J.Sanjeevikumar, Associate Professor	Dept of EEE, PRIST DU	Physical	
7.	Mr.R.Elangovan, Assistant Professor	Dept of EEE, PRIST DU	Physical	
8.	Prof.R.Tamizhselvan, Dean	Dept of MECH, PRIST DU	Physical	
9.	M.Vignesh, Alumini	AssitantEngineer,Green field technology,chennai	Physical	
10	Sk.Vishnuvarthan	Student	Physical	

Date:

BOS Chairman/HOD

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SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

PROGRAM HANDBOOK

B.Tech FULL TIME

[Regulation 2021]
[for candidates admitted to B.Tech EEE program from June 2021 onwards]

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:

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

B. **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.

C. **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.

D. **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.

E. **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.

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.

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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	PROGRAMM OUTCOMES												
EDUCATIONAL OBJECTIVES	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

1-Reasonable: 2- Significant: 3- Strong

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COURSE STRUCTURE

B. TECH-EEE

R 2021

SEMESTER I

S.No	Course Code	Course Title	L	T	P	C
1	21147IP	Induction Programme	-	-	-	0
2	21147S11	Professional English – I	3	0	0	3
3	21148S12	Matrices and Calculus	3	1	0	4
4	21149S13	Engineering Physics	3	0	0	3
5	21149S14	Engineering Chemistry	3	0	0	3
6	21150S15	Problem Solving and Python programming	3	0	0	3
7	21150L16	Problem Solving and Python Programming Laboratory	0	0	4	2
8	21149L17	Physics and Chemistry Laboratory	0	0	4	2
9	21147L18	Communication Laboratory - I	0	0	2	1
			TOTAL CREDITS			21

SEMESTER – II

S.No	Course Code	Course Name	L	T	P	C
1	21147S21	Professional English – II	2	0	0	2
2	21148S22	Statistics and Numerical Methods	3	1	0	4
3	21149S23C	Physics for Electrical Engineering	3	0	0	3
4	21154S24	Engineering Graphics	2	0	4	4
5	21154S25	Basic Civil and Mechanical Engineering	3	0	0	3
6	21153S26B	Electric Circuit Analysis	3	1	0	4
7	21154L21	Engineering Practices Laboratory	0	0	4	2
8	21153L22B	Electric Circuits Laboratory	0	0	4	2
9	21147L23	Communication Laboratory - II	0	0	4	2
			TOTAL CREDITS			26

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SEMESTER III

S.No	Course Code	Course Name	L	T	P	C
1	21148S31C	Probability and Complex Functions	3	1	0	4
2	21153C32	Digital Logic Circuits	3	0	0	3
3	21153C33	Electromagnetic Fields	3	1	0	4
4	21153C34	Electrical Machines – I	3	0	0	3
5	21153S35	Electron Devices and Circuits	3	0	0	3
6	21153S36	C Programming and Data Structures	3	0	0	3
7	21153L31	Electronic Devices and Circuits Laboratory	0	0	4	2
8	21153L32	Electrical Machines Laboratory - I	0	0	4	2
9	21153L33	C Programming and Data Structures Laboratory	0	0	4	2
10	21153L34	Professional Development	0	0	2	1
					TOTAL CREDITS	27

SEMESTER IV

S.No	Course Code	Course Name	L	T	P	C
1	21153C41	Electrical Machines – II	3	0	0	3
2	21153C42	Transmission and Distribution	3	0	0	3
3	21153C43	Measurements and Instrumentation	3	0	0	3
4	21153C44	Linear Integrated Circuits	3	0	0	3
5	21153C45	Microprocessors and Microcontrollers	3	0	0	3
6	21149S46	Environmental Sciences and Sustainability	2	0	0	2
7	21153L47	Electrical Machines Laboratory - II	0	0	4	2
8	21153L48	Linear and Digital Circuits Laboratory	0	0	4	2
9	21153L49	Microprocessors and Microcontrollers Laboratory	0	0	4	2
					TOTAL CREDITS	23

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SEMESTER – V

S.No	Course Code	Course Name	L	T	P	C
1	21153C51	Power System Analysis	3	0	0	3
2	21153C52	Control Systems	3	0	0	3
3	21153C53	Power Electronics	3	0	0	3
4	21153E54_	Elective I	3	0	0	3
5	21153E55_	Elective II	2	0	2	3
6	21153E56_	Elective III	2	0	2	3
7	21147MC51_	Mandatory Course I	3	0	0	0
8	21153L57	Control and Instrumentation Laboratory	0	0	4	2
9	21153L58	Power Electronics Laboratory	0	0	4	2
					TOTAL CREDITS	22

SEMESTER – VI

S.No	Course Code	Course Name	L	T	P	C
1	21150OE61_	Open Elective I	2	0	2	3
2	21153C62	Power System Operation and Control	3	0	0	3
3	21153C63	Protection and Switchgear	3	0	0	3
4	21153E64_	Elective IV	3	0	0	3
5	21153E65_	Elective V	2	0	2	3
6	21153E66_	Elective VI	2	0	2	3
7	21147MC61_	Mandatory Course II	3	0	0	0
8	21153L67	Power System Laboratory	0	0	4	2
					TOTAL CREDITS	20

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SEMESTER – VII

S.No	Course Code	Course Name	L	T	P	C
1	21147S71	Human Values and Ethics	2	0	0	2
2	211__OE72_	Open Elective II	2	0	2	3
3	211__OE73_	Open Elective III	3	0	0	3
4	211__OE74_	Open Elective IV	3	0	0	3
5	21160E75_	Elective VII	3	0	0	3
6	21153E76_	Elective VIII	2	0	2	3
7	21153C77	High Voltage Engineering	3	0	0	3
					TOTAL CREDITS	20

SEMESTER – VIII

S.No	Course Code	Course Name	L	T	P	C
1.	21153P81	Project Work/ Internship	0	0	20	10
					TOTAL CREDITS	10

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LIST OF ELECTIVES

MANDATORY COURSES I (V SEMESTER)

S.No	Course Code	Course Name	L	T	P	C
1.	21147MC51A	Introduction to Women and Gender Studies	3	0	0	0
2.	21147MC51B	Elements of Literature	3	0	0	0
3.	21147MC51C	Film Appreciation	3	0	0	0
4.	21147MC51D	Disaster Management	3	0	0	0

MANDATORY COURSES II (VI SEMESTER)

S.No	Course Code	Course Name	L	T	P	C
1.	21147MC61A	Well Being with Traditional Practices (Yoga, Ayurveda and Siddha)	3	3	0	0
2.	21147MC61B	History of Science and Technology in India	3	0	0	0
3.	21147MC61C	Political and Economic Thought for a Humane Society	3	0	0	0
4.	21147MC61D	State, Nation Building and Politics in India	3	0	0	0
5.	21147MC61E	Safety in Engineering Industries	3	0	0	0

ELECTIVE –I (V SEMESTER)

S.No	Course Code	Course Name	L	T	P	C
1.	21153E54A	Utilization and Conservation of Electrical Energy	3	0	0	3
2.	21153E54B	Embedded System Design	3	0	0	3
3.	21153E54C	Electric Vehicle Architecture	3	0	0	3
4.	21153E54D	Energy Management and Auditing	3	0	0	3
5.	21153E54E	SMPS and UPS	3	0	0	3
6.	21153E54F	Smart System Automation	3	0	0	3

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ELECTIVE – II (VSEMESTER)

S.No	Course Code	Course Name	L	T	P	C
1.	21153E55A	Special Electrical Machines	3	0	0	3
2.	21153E55B	Process Modeling and Simulation	3	0	0	3
3.	21153E55C	Energy Storage Systems	3	0	0	3
4.	21153E55D	Testing of Electric Vehicles	3	0	0	3
5.	21153E55E	Non Linear Control	3	0	0	3

ELECTIVE – III (V SEMESTER)

S.No	Course Code	Course Name	L	T	P	C
1	21153E56A	Embedded C- Programming	3	0	0	3
2	21153E56B	Smart Grids	3	0	0	3
3	21153E56C	Control of Power Electronics Circuits	3	0	0	3
4	21153E56D	VLSI Design	3	0	0	3
5	21153E56E	Intelligent control of Electric Vehicles	3	0	0	3
6	21153E56F	Adaptive Control	3	0	0	3
7	21153E56G	PLC Programming	3	0	0	3

ELECTIVE – IV (VI SEMESTER)

S.No	Course Code	Course Name	L	T	P	C
1	21153E64A	Power System Transients	3	0	0	3
2	21153E64B	Power Quality	3	0	0	3
3	21153E64C	Power Electronics for Renewable Energy Systems	3	0	0	3
4	21153E64D	Embedded System for Automotive Applications	3	0	0	3
5	21153E64E	Grid Integration of Electric Vehicles	3	0	0	3
6	21153E64F	Optimal Control	3	0	0	3

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ELECTIVE – VIII (VII SEMESTER)

S.No	Course Code	Course Name	L	T	P	C
1	21153E76A	Substation Engineering and Substation and Substation Automation	3	0	0	3
2	21153E76B	Multilevel Power Converters	3	0	0	3
3	21153E76C	Embedded Processors	3	0	0	3
4	21153E76D	Electric Vehicle Design, Mechanics and Control	3	0	0	3
5	21153E76E	System Identification	3	0	0	3
6	21153E76F	Design and Modelling of Renewable Energy Systems	3	0	0	3

OPEN ELECTIVE I (VI SEM)

S.No	Course Code	Course Name	L	T	P	C
1	21150OE61A	IoT Concepts and Applications	2	0	2	3
2	21150OE61B	Augmented and Virtual Reality	2	0	2	3

OPEN ELECTIVE II (VII SEM)

S.No	Course Code	Course Name	L	T	P	C
1	21150OE74A	Artificial Intelligence and Machine Learning Fundamentals	2	0	2	3
2	21150OE74B	Data Science Fundamentals	2	0	2	3

OPEN ELECTIVE III (VII SEM)

S.No	Course Code	Course Name	L	T	P	C
1	21147OE73A	English for Competitive Examinations	3	0	0	3
2	21154OE73A	Industrial Management	3	0	0	3
3	21154OE73B	Introduction to nondestructive testing	3	0	0	3
4	21155OE73A	Remote Sensing Concepts	3	0	0	3
5	21155OE73B	Drinking Water Supply and Treatment	3	0	0	3
6	21152OE73A	Nano Technology	3	0	0	3
7	21152OE73B	Signals and Systems	3	0	0	3

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ELECTIVE – V (VI SEMESTER)

S.No	Course Code	Course Name	L	T	P	C
1	21153E65A	HVDC and FACTS	3	0	0	3
2	21153E65B	Electrical Drives	3	0	0	3
3	21153E65C	Embedded Control for Electrical Drives	3	0	0	3
4	21153E65D	Design of Electric Vehicle Charging System	3	0	0	3
5	21153E65E	Model Based Control	3	0	0	3
6	21153E65F	Grid integrating Techniques and Challenges	3	0	0	3

ELECTIVE – VI (VI SEMESTER)

S.No	Course Code	Course Name	L	T	P	C
1	21153E66A	Digital Signal Processing System	3	0	0	3
2	21153E66B	Under Ground Cable Engineering	3	0	0	3
3	21153E66C	Analysis of Electrical Machines	3	0	0	3
4	21153E66D	Design of Motor and Power Converters for Electric Vehicles	3	0	0	3
5	21153E66E	Hybrid Energy Technology	3	0	0	3
6	21153E66F	Computer Control of Processes	3	0	0	3

ELECTIVE – VII (VII SEMESTER)

S.No	Course Code	Course Name	L	T	P	C
1.	21160S75A	Total Quality Management	3	0	0	3
2.	21160S75B	Engineering Economics and Financial Accounting	3	0	0	3
3.	21160S75C	Human Resource Management	3	0	0	3
4.	21160S75D	Knowledge Management	3	0	0	3
5.	21160S75E	Industrial Management	3	0	0	3
6.	21160S75F	Principles of Management	3	0	0	3

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OPEN ELECTIVE IV (VII SEM)

S.No	Course Code	Course Name	L	T	P	C
1	21154OE74A	Additive Manufacturing	3	0	0	3
2	21154OE74B	Industrial safety	3	0	0	3
3	21155OE74A	Geographical Information System	3	0	0	3
4	21155OE74B	Basics of Integrated Water Resources Management	3	0	0	3
5	21152OE74A	Wearable devices	3	0	0	3
6	21152OE74B	Medical Informatics	3	0	0	3

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CREDITS DISTRIBUTION

CGPA CREDITS

Semester	Core	Elective	Free Elective	Management Elective	RSD Course	Others	Total
I	21	-	-	-	-	-	21
II	26	-	-	-	-	-	26
III	27	-	-	-	-	-	27
IV	23	-	-	-	-	-	23
V	13	09	-	-	-	-	22
VI	08	09	03	-	-	-	20
VII	05	03	09	03	-	-	20
VIII	10	-	-	-	-	-	10
Over ALL Credits							169

NON CGPA CREDITS

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

TOTAL CREDITS	
CGPA CREDITS	169
NON-CGPA CREDITS	03
TOTAL	172

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Vallam, Thanjavur-613 403.

SYLLABI

Head of the Department
Electrical and Electronics Engineering
Ponnaiyah Ramajayam Institute of
Science & Technology (PRIST)
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21153C32 **DIGITAL LOGIC CIRCUITS**

L	T	P	C
3	1	0	3

OBJECTIVES:

- To study various number systems and simplify the logical expressions using Boolean functions
- To study combinational circuits
- To design various synchronous and asynchronous circuits.
- To introduce asynchronous sequential circuits and PLDs
- To introduce digital simulation for development of application oriented logic circuits.

UNIT I NUMBER SYSTEMS AND DIGITAL LOGIC FAMILIES 6+6

Review of number systems, binary codes, error detection and correction codes (Parity and Hamming code) - Digital Logic Families -comparison of RTL, DTL, TTL, ECL and MOS families -operation, characteristics of digital logic family.

UNIT II COMBINATIONAL CIRCUITS 6+6

Combinational logic - representation of logic functions-SOP and POS forms, K-map representations - minimization using K maps - simplification and implementation of combinational logic – multiplexers and de multiplexers - code converters, adders, subtractors, Encoders and Decoders.

UNIT III SYNCHRONOUS SEQUENTIAL CIRCUITS 6+6

Sequential logic- SR, JK, D and T flip flops - level triggering and edge triggering - counters - asynchronous and synchronous type - Modulo counters - Shift registers - design of synchronous sequential circuits – Moore and Melay models- Counters, state diagram; state reduction; state assignment.

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21153C33 **ELECTROMAGNETIC FIELDS** L T P C
2 2 0 3

OBJECTIVES:

- To introduce the basic mathematical concepts related to electromagnetic vector fields
- To impart knowledge on the concepts of
  - Electrostatic fields, electrical potential, energy density and their applications.
  - Magneto static fields, magnetic flux density, vector potential and its applications.
  - Different methods of emf generation and Maxwell's equations
  - Electromagnetic waves and characterizing parameters

UNIT I ELECTROSTATICS – I 6+6

Sources and effects of electromagnetic fields – Coordinate Systems – Vector fields –Gradient, Divergence, Curl – theorems and applications - Coulomb's Law – Electric field intensity – Field due to discrete and continuous charges – Gauss's law and applications.

B.TECH-EEE-R2021-SEM III

UNIT II ELECTROSTATICS – II 6+6

Electric potential – Electric field and equipotential plots, Uniform and Non-Uniform field, Utilization factor – Electric field in free space, conductors, dielectrics - Dielectric polarization – Dielectric strength - Electric field in multiple dielectrics – Boundary conditions, Poisson's and Laplace's equations, Capacitance, Energy density, Applications.

UNIT III MAGNETOSTATICS 6+6

Lorentz force, magnetic field intensity (H) – Biot–Savart's Law - Ampere's Circuit Law – H due to straight conductors, circular loop, infinite sheet of current, Magnetic flux density (B) – B in free space, conductor, magnetic materials – Magnetization, Magnetic field in multiple media – Boundary conditions, scalar and vector potential, Poisson's Equation, Magnetic force, Torque, Inductance, Energy density, Applications.

UNIT IV ELECTRODYNAMIC FIELDS 6+6

Magnetic Circuits - Faraday's law – Transformer and motional EMF – Displacement current - Maxwell's equations (differential and integral form) – Relation between field theory and circuit theory – Applications.

UNIT V ELECTROMAGNETIC WAVES 6+6

Electromagnetic wave generation and equations – Wave parameters; velocity, intrinsic impedance, propagation constant – Waves in free space, lossy and lossless dielectrics, conductors- skin depth - Poynting vector – Plane wave reflection and refraction.

TOTAL : 60 PERIODS

OUTCOMES:

- Ability to understand the basic mathematical concepts related to electromagnetic vector fields.
- Ability to understand the basic concepts about electrostatic fields, electrical potential, energy density and their applications.
- Ability to acquire the knowledge in magneto static fields, magnetic flux density, vector potential and its applications.
- Ability to understand the different methods of emf generation and Maxwell's equations
- Ability to understand the basic concepts electromagnetic waves and characterizing parameters
- Ability to understand and compute Electromagnetic fields and apply them for design and analysis of electrical equipment and systems

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21153C35 **ELECTRON DEVICES AND CIRCUITS** L T P C 3 0 0 3

OBJECTIVES:

The student should be made to:

- Understand the structure of basic electronic devices.
- Be exposed to active and passive circuit elements.
- Familiarize the operation and applications of transistor like BJT and FET.
- Explore the characteristics of amplifier gain and frequency response.
- Learn the required functionality of positive and negative feedback systems.

UNIT I PN JUNCTION DEVICES 9

PN junction diode –structure, operation and V-I characteristics, diffusion and transition capacitance - Rectifiers – Half Wave and Full Wave Rectifier,– Display devices- LED, Laser diodes, Zener diodecharacteristics- Zener Reverse characteristics – Zener as regulator

UNIT II TRANSISTORS AND THYRISTORS 9

BJT, JFET, MOSFET- structure, operation, characteristics and Biasing UJT, Thyristors and IGBT - Structure and characteristics.

UNIT III AMPLIFIERS 9

BJT small signal model – Analysis of CE, CB, CC amplifiers- Gain and frequency response –MOSFET small signal model– Analysis of CS and Source follower – Gain and frequency response- High frequency analysis.

UNIT IV MULTISTAGE AMPLIFIERS AND DIFFERENTIAL AMPLIFIER 9

BIMOS cascade amplifier, Differential amplifier – Common mode and Difference mode analysis – FET input stages – Single tuned amplifiers – Gain and frequency response – Neutralization methods, power amplifiers –Types (Qualitative analysis).

UNIT V FEEDBACK AMPLIFIERS AND OSCILLATORS 9

Advantages of negative feedback – voltage / current, series , Shunt feedback –positive feedback – Condition for oscillations, phase shift – Wien bridge, Hartley, Colpitts and Crystal oscillators.

OUTCOMES: **TOTAL : 45 PERIODS**

Upon Completion of the course, the students will be ability to:

- Explain the structure and working operation of basic electronic devices.
- Able to identify and differentiate both active and passive elements
- Analyze the characteristics of different electronic devices such as diodes and transistors
- Choose and adapt the required components to construct an amplifier circuit.
- Employ the acquired knowledge in design and analysis of oscillators

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Head of the Department
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Ponnaiyah Ramajayam Institute of
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21153C42 **ELECTRICAL MACHINES – II**

L	T	P	C
2	2	0	3

OBJECTIVES:

To impart knowledge on the following Topics

- Construction and performance of salient and non – salient type synchronous generators.
- Principle of operation and performance of synchronous motor.
- Construction, principle of operation and performance of induction machines.
- Starting and speed control of three-phase induction motors.
- Construction, principle of operation and performance of single phase induction motors and special machines.

UNIT I SYNCHRONOUS GENERATOR 6+6

Constructional details – Types of rotors –winding factors- emf equation – Synchronous reactance – Armature reaction – Phasor diagrams of non salient pole synchronous generator connected to infinite bus--Synchronizing and parallel operation – Synchronizing torque -Change of excitation and mechanical input- Voltage regulation – EMF, MMF, ZPF and A.S.A methods – steady state power- angle characteristics– Two reaction theory –slip test -short circuit transients - Capability Curves

UNIT II SYNCHRONOUS MOTOR 6+6

Principle of operation – Torque equation – Operation on infinite bus bars - V and Inverted V curves – Power input and power developed equations – Starting methods – Current loci for constant power input, constant excitation and constant power developed-Hunting – natural frequency of oscillations – damper windings- synchronous condenser.

UNIT III THREE PHASE INDUCTION MOTOR 6+6

Constructional details – Types of rotors — Principle of operation – Slip –cogging and crawling- Equivalent circuit – Torque-Slip characteristics - Condition for maximum torque – Losses and efficiency – Load test - No load and blocked rotor tests - Circle diagram – Separation of losses – Double cage induction motors –Induction generators – Synchronous induction motor.

UNIT IV STARTING AND SPEED CONTROL OF THREE PHASE INDUCTION MOTOR 6+6

Need for starting – Types of starters – DOL, Rotor resistance, Autotransformer and Star- delta starters – Speed control – Voltage control, Frequency control and pole changing – Cascaded connection-V/f control – Slip power recovery scheme-Braking of three phase induction motor: Plugging, dynamic braking and regenerative braking.

UNIT V SINGLE PHASE INDUCTION MOTORS AND SPECIAL MACHINES 6+6

Constructional details of single phase induction motor – Double field revolving theory and operation – Equivalent circuit – No load and blocked rotor test – Performance analysis – Starting methods of single-phase induction motors – Capacitor-start capacitor run Induction motor-Shaded pole induction motor - Linear induction motor – Repulsion motor - Hysteresis motor - AC series motor- Servo motors- Stepper motors - introduction to magnetic levitation systems.

TOTAL : 60 PERIODS

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OUTCOMES:

- Ability to understand the construction and working principle of Synchronous Generator
- Ability to understand MMF curves and armature windings.
- Ability to acquire knowledge on Synchronous motor.
- Ability to understand the construction and working principle of Three phase Induction Motor
- Ability to understand the construction and working principle of Special Machines
- Ability to predetermine the performance characteristics of Synchronous Machines.

TEXT BOOKS:

1. A.E. Fitzgerald, Charles Kingsley, Stephen. D. Umans, 'Electric Machinery', Mc Graw Hill publishing Company Ltd, 2003.
2. Vincent Del Toro, 'Basic Electric Machines' Pearson India Education, 2016.
3. Stephen J. Chapman, 'Electric Machinery Fundamentals' 4th edition, McGraw Hill Education Pvt. Ltd, 2010.

REFERENCES

1. D.P. Kothari and I.J. Nagrath, 'Electric Machines', McGraw Hill Publishing Company Ltd, 2002.
2. P.S. Bhimbhra, 'Electrical Machinery', Khanna Publishers, 2003.
3. M.N. Bandyopadhyay, Electrical Machines Theory and Practice, PHI Learning PVT LTD., New Delhi, 2009.
4. B.R.Gupta, 'Fundamental of Electric Machines' New age International Publishers, 3rd Edition ,Reprint 2015.
5. Murugesh Kumar, 'Electric Machines', Vikas Publishing House Pvt. Ltd, 2002.
6. Alexander S. Langsdorf, 'Theory of Alternating-Current Machinery', McGraw Hill Publications, 2001.

21153C43 **TRANSMISSION AND DISTRIBUTION**

L	T	P	C
3	0	0	3

OBJECTIVES:

- To study the structure of electric power system and to develop expressions for the computation of transmission line parameters.
- To obtain the equivalent circuits for the transmission lines based on distance and to determine voltage regulation and efficiency.
- To understand the mechanical design of transmission lines and to analyze the voltage distribution in insulator strings to improve the efficiency.
- To study the types, construction of cabilitys and methods to improve the efficiency.
- To study about distribution systems, types of substations, methods of grounding, EHVAC, HVDC and FACTS.

UNIT I TRANSMISSION LINE PARAMETERS 9

Structure of Power System - Parameters of single and three phase transmission lines with single and double circuits -Resistance, inductance and capacitance of solid, stranded and bundled conductors, Symmetrical and unsymmetrical spacing and transposition - application of self and mutual GMD; skin and proximity effects -Typical configurations, conductor types and electrical parameters of EHV lines.

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Electrical and Electronics Engineering
Ponnaiyah Ramajayam Institute of Science & Technology (PRIST)
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UNIT II MODELLING AND PERFORMANCE OF TRANSMISSION LINES 9

Performance of Transmission lines - short line, medium line and long line - equivalent circuits, phasor diagram, attenuation constant, phase constant, surge impedance - transmission efficiency and voltage regulation, real and reactive power flow in lines - Power Circle diagrams - Formation of Corona – Critical Voltages – Effect on Line Performance.

UNIT III MECHANICAL DESIGN OF LINES 9

Mechanical design of OH lines – Line Supports –Types of towers – Stress and Sag Calculation – Effects of Wind and Ice loading. Insulators: Types, voltage distribution in insulator string, improvement of string efficiency, testing of insulators.

UNIT IV UNDER GROUND CABILITYS 9

Underground cabilitys - Types of cabilitys – Construction of single core and 3 core Cabilitys - Insulation Resistance – Potential Gradient - Capacitance of Single-core and 3 core cabilitys - Grading of cabilitys - Power factor and heating of cabilitys– DC cabilitys.

UNIT V DISTRIBUTION SYSTEMS 9

Distribution Systems – General Aspects – Kelvin's Law – AC and DC distributions - Techniques of Voltage Control and Power factor improvement – Distribution Loss –Types of Substations -Methods of Grounding – Trends in Transmission and Distribution: EHVAC, HVDC and FACTS (Qualitative treatment only).

TOTAL : 45 PERIODS

OUTCOMES:

- To understand the importance and the functioning of transmission line parameters.
- To understand the concepts of Lines and Insulators.
- To acquire knowledge on the performance of Transmission lines.
- To acquire knowledge on Underground Cabilitys
- To become familiar with the function of different components used in Transmission and Distribution levels of power system and modelling of these components.

TEXT BOOKS:

1. D.P.Kothari, I.J. Nagarath, 'Power System Engineering', Mc Graw-Hill Publishing Company limited, New Delhi, Second Edition, 2008.
2. C.L.Wadhwa, 'Electrical Power Systems', New Academic Science Ltd, 2009.
3. S.N. Singh, 'Electric Power Generation, Transmission and Distribution', Prentice Hall of India Pvt. Ltd, New Delhi, Second Edition, 2011.

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1. B.R.Gupta, 'Power System Analysis and Design' S. Chand, New Delhi, Fifth Edition, 2008.
2. Luces M.Fualken berry, Walter Coffer, 'Electrical Power Distribution and Transmission', Pearson Education, 2007.
3. Arun Ingole, "power transmission and distribution" Pearson Education, 2019
4. J.Brian, Hardy and Colin R.Bayliss 'Transmission and Distribution in Electrical Engineering', Newnes; Fourth Edition, 2012.
5. G.Ramamurthy, "Handbook of Electrical power Distribution," Universities Press, 2013.
6. V.K.Mehta, Rohit Mehta, 'Principles of power system', S. Chand & Company Ltd, New Delhi, 2013

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21153C44 **MEASUREMENTS AND INSTRUMENTATION**

L	T	P	C
3	0	0	3

OBJECTIVES:

To impart knowledge on the following Topics

- Basic functional elements of instrumentation.
- Fundamentals of electrical and electronic instruments.
- Comparison between various measurement techniques.
- Various storage and display devices.
- Various transducers and the data acquisition systems.

UNIT I INTRODUCTION 9

Functional elements of an instrument – Static and dynamic characteristics – Errors in measurement – Statistical evaluation of measurement data – Standards and calibration- Principle and types of analog and digital voltmeters, ammeters.

UNIT II ELECTRICAL AND ELECTRONIC INSTRUMENTS 9

Principle and types of multi meters – Single and three phase watt meters and energy meters – Magnetic measurements – Determination of B-H curve and measurements of iron loss – Instrument transformers – Instruments for measurement of frequency and phase.

UNIT III COMPARATIVE METHODS OF MEASUREMENTS 9

D.C potentiometers, D.C (Wheat stone, Kelvin and Kelvin Double bridge) & A.C bridges (Maxwell, Anderson and Schering bridges), transformer ratio bridges, self-balancing bridges. Interference & screening – Multiple earth and earth loops - Electrostatic and electromagnetic Interference – Grounding techniques.

UNIT IV STORAGE AND DISPLAY DEVICES 9

Magnetic disk and tape – Recorders, digital plotters and printers, CRT display, digital CRO, LED, LCD & Dot matrix display – Data Loggers.

UNIT V TRANSDUCERS AND DATA ACQUISITION SYSTEMS 9

Classification of transducers – Selection of transducers – Resistive, capacitive & inductive Transducers – Piezoelectric, Hall effect, optical and digital transducers – Elements of data acquisition system – Smart sensors-Thermal Imagers.

TOTAL : 45 PERIODS

OUTCOMES:

- To acquire knowledge on Basic functional elements of instrumentation
- To understand the concepts of Fundamentals of electrical and electronic instruments
- Ability to compare between various measurement techniques
- To acquire knowledge on Various storage and display devices
- To understand the concepts Various transducers and the data acquisition systems
- Ability to model and analyze electrical and electronic Instruments and understand the operational features of display Devices and Data Acquisition System.

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Ponnaiyah Ramajayam Institute of
Science and Technology (PRIST)
Deemed to be University
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TEXT BOOKS:

1. A.K. Sawhney, 'A Course in Electrical & Electronic Measurements & Instrumentation', Dhanpat Rai and Co, 2010.
2. J. B. Gupta, 'A Course in Electronic and Electrical Measurements', S. K. Kataria & Sons, Delhi, 2013.
3. Doebelin E.O. and Manik D.N., Measurement Systems – Applications and Design, Special Indian Edition, McGraw Hill Education Pvt. Ltd., 2007.

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1. H.S. Kalsi, 'Electronic Instrumentation', McGraw Hill, III Edition 2010.
2. D.V.S. Murthy, 'Transducers and Instrumentation', Prentice Hall of India Pvt Ltd, 2015.
3. David Bell, ' Electronic Instrumentation & Measurements', Oxford University Press, 2013.
4. Martin Reissland, 'Electrical Measurements', New Age International (P) Ltd., Delhi, 2001.
5. Alan. S. Morris, Principles of Measurements and Instrumentation, 2nd Edition, Prentice Hall of India, 2003.

21153C45 LINEAR INTEGRATED CIRCUITS AND APPLICATIONS

L	T	P	C
3	0	0	3

OBJECTIVES:

To impart knowledge on the following topics

- Signal analysis using Op-amp based circuits.
- Applications of Op-amp.
- Functional blocks and the applications of special ICs like Timers, PLL circuits, regulator Circuits.
- IC fabrication procedure.

UNIT I IC FABRICATION

9

IC classification, fundamental of monolithic IC technology, epitaxial growth, masking and etching, diffusion of impurities. Realisation of monolithic ICs and packaging. Fabrication of diodes, capacitance, resistance, FETs and PV Cell.

UNIT II CHARACTERISTICS OF OPAMP

9

Ideal OP-AMP characteristics, DC characteristics, AC characteristics, differential amplifier; frequency response of OP-AMP; Basic applications of op-amp – Inverting and Non-inverting Amplifiers, summer, differentiator and integrator-V/I & I/V converters.

UNIT III APPLICATIONS OF OPAMP

9

Instrumentation amplifier and its applications for transducer Bridge, Log and Antilog Amplifiers- Analog multiplier & Divider, first and second order active filters, comparators, multivibrators, waveform generators, clippers, clampers, peak detector, S/H circuit, D/A converter (R- 2R ladder and weighted resistor types), A/D converters using opamps.

UNIT IV SPECIAL ICs

9

Functional block, characteristics of 555 Timer and its PWM application - IC-566 voltage controlled oscillator IC; 565-phase locked loop IC, AD633 Analog multiplier ICs.

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Electrical and Electronics Engineering
Ponnaiyah Ramajayam Institute of Science & Technology (PRIST)
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UNIT V APPLICATION ICs 9

AD623 Instrumentation Amplifier and its application as load cell weight measurement - IC voltage regulators –LM78XX, LM79XX; Fixed voltage regulators its application as Linear power supply - LM317, 723 Variability voltage regulators, switching regulator- SMPS - ICL 8038 function generator IC.

TOTAL : 45 PERIODS

OUTCOMES:

- Ability to acquire knowledge in IC fabrication procedure
- Ability to analyze the characteristics of Op-Amp
- To understand the importance of Signal analysis using Op-amp based circuits.
- Functional blocks and the applications of special ICs like Timers, PLL circuits, regulator Circuits.
- To understand and acquire knowledge on the Applications of Op-amp
- Ability to understand and analyse, linear integrated circuits their Fabrication and Application.

TEXT BOOKS:

1. David A. Bell, 'Op-amp & Linear ICs', Oxford, 2013.
2. D. Roy Choudhary, Sheil B. Jani, 'Linear Integrated Circuits', II edition, New Age, 2003.
3. Ramakant A.Gayakward, 'Op-amps and Linear Integrated Circuits', IV edition, Pearson Education, 2003 / PHI. 2000.

REFERENCES

1. Fiore,"Opamps & Linear Integrated Circuits Concepts & applications", Cengage, 2010.
2. Floyd ,Buchla,"Fundamentals of Analog Circuits, Pearson, 2013.
3. Jacob Millman, Christos C.Halkias, 'Integrated Electronics - Analog and Digital circuits system', McGraw Hill, 2003.
4. Robert F.Coughlin, Fredrick F. Driscoll, 'Op-amp and Linear ICs', Pearson, 6th edition,2012.
5. Sergio Franco, 'Design with Operational Amplifiers and Analog Integrated Circuits', Mc Graw Hill, 2016.
6. Muhammad H. Rashid,' Microelectronic Circuits Analysis and Design' Cengage Learning, 2011.

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21153L47 **ELECTRICAL MACHINES LABORATORY - II**

L	T	P	C
0	0	3	2

OBJECTIVES:

- To expose the students to the operation of synchronous machines and induction motors and give them experimental skill.

LIST OF EXPERIMENTS

1. Regulation of three phase alternator by EMF and MMF methods.
2. Regulation of three phase alternator by ZPF and ASA methods.
3. Regulation of three phase salient pole alternator by slip test.
4. Measurements of negative sequence and zero sequence impedance of alternators.
5. V and Inverted V curves of Three Phase Synchronous Motor.
6. Load test on three-phase induction motor.
7. No load and blocked rotor tests on three-phase induction motor (Determination of equivalent circuit parameters).
8. Separation of No-load losses of three-phase induction motor.
9. Load test on single-phase induction motor.
10. No load and blocked rotor test on single-phase induction motor.
11. Study of Induction motor Starters

TOTAL: 60 PERIODS

OUTCOMES:

At the end of the course, the student should have the :

- Ability to understand and analyze EMF and MMF methods
- Ability to analyze the characteristics of V and Inverted V curves
- Ability to understand the importance of Synchronous machines
- Ability to understand the importance of Induction Machines
- Ability to acquire knowledge on separation of losses

LIST OF EQUIPMENT FOR A BATCH OF 30 STUDENTS:

1. Synchronous Induction motor 3HP – 1 No.
2. DC Shunt Motor Coupled With Three phase Alternator – 4 nos
3. DC Shunt Motor Coupled With Three phase Slip ring Induction motor – 1 No.
4. Three Phase Induction Motor with Loading Arrangement – 2 nos
5. Single Phase Induction Motor with Loading Arrangement – 2 nos
6. Tachometer -Digital/Analog – 8 nos
7. Single Phase Auto Transformer – 2 nos
8. Three Phase Auto Transformer – 3 nos
9. Single Phase Resistive Loading Bank – 2 nos
10. Three Phase Resistive Loading Bank – 2 nos
11. Capacitor Bank – 1 No.

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21153L48 **LINEAR AND DIGITAL INTEGRATED CIRCUITS LABORATORY**

L	T	P	C
0	0	3	2

OBJECTIVES:

- To learn design, testing and characterizing of circuit behavior with digital and analog ICs.

LIST OF EXPERIMENTS

1. Implementation of Boolean Functions, Adder and Subtractor circuits.
2. Code converters: Excess-3 to BCD and Binary to Gray code converter and vice-versa
3. Parity generator and parity checking
4. Encoders and Decoders
5. Counters: Design and implementation of 3-bit modulo counters as synchronous and Asynchronous types using FF IC's and specific counter IC.
6. Shift Registers: Design and implementation of 4-bit shift registers in SISO, SIPO, PISO, PIPO modes using suitability IC's.
7. Study of multiplexer and de multiplexer
8. Timer IC application: Study of NE/SE 555 timer in Astability, Monostability operation.
9. Application of Op-Amp: inverting and non-inverting amplifier, Adder, comparator, Integrator and Differentiator.
10. Voltage to frequency characteristics of NE/ SE 566 IC.
11. Variability Voltage Regulator using IC LM317.

TOTAL: 60 PERIODS

OUTCOMES:

At the end of the course, the student should have the :

- Ability to understand and implement Boolean Functions.
- Ability to understand the importance of code conversion
- Ability to Design and implement 4-bit shift registers
- Ability to acquire knowledge on Application of Op-Amp
- Ability to Design and implement counters using specific counter IC.

LIST OF EQUIPMENT FOR A BATCH OF 30 STUDENTS: (3 per Batch)

S.No	Name of the equipments / Components	Quantity Required	Remarks
1	Dual ,(0-30V) variability Power Supply	10	-
2	CRO	9	30MHz
3	Digital Multimeter	10	Digital
4	Function Generator	8	1 MHz
5	IC Tester (Analog)	2	
6	Bread board	10	

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7	Computer (PSPICE installed)	1	
Consumabilitys (sufficient quantity)			
1	IC 741/ IC NE555/566/565		
2	Digital IC types		
3	LED		
4	LM317		
5	LM723		
6	ICSG3524 / SG3525		
7	Transistor – 2N3391		
8	Diodes, IN4001,BY126		
9	Zener diodes		
10	Potentiometer		
11	Step-down transformer 230V/12-0-12V		
12	Capacitor		
13	Resistors 1/4 Watt Assorted		
14	Single Strand Wire		

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21153C51	POWER SYSTEM ANALYSIS	L	T	P	C
		3	0	0	3

OBJECTIVES:

- To model the power system under steady state operating condition
- To understand and apply iterative techniques for power flow analysis
- To model and carry out short circuit studies on power system
- To model and analyze stability problems in power system

UNIT I POWER SYSTEM 9

Need for system planning and operational studies - Power scenario in India - Power system components – Representation - Single line diagram - per unit quantities - p.u. impedance diagram - p.u. reactance diagram - Network graph, Bus incidence matrix, Primitive parameters, Bus admittance matrix from primitive parameters - Representation of off- nominal transformer - Formation of bus admittance matrix of large power network.

UNIT II POWER FLOW ANALYSIS 9

Bus classification - Formulation of Power Flow problem in polar coordinates - Power flow solution using Gauss Seidel method - Handling of Voltage controlled buses - Power Flow Solution by Newton Raphson method.

UNIT III SYMMETRICAL FAULT ANALYSIS 9

Assumptions in short circuit analysis - Symmetrical short circuit analysis using Thevenin's theorem - Bus Impedance matrix building algorithm (without mutual coupling) - Symmetrical fault analysis through bus impedance matrix - Post fault bus voltages - Fault level - Current limiting reactors.

UNIT IV UNSYMMETRICAL FAULT ANALYSIS 9

Symmetrical components - Sequence impedances - Sequence networks - Analysis of unsymmetrical faults at generator terminals: LG, LL and LLG - unsymmetrical fault occurring at any point in a power system - computation of post fault currents in symmetrical component and phasor domains.

UNIT V STABILITY ANALYSIS 9

Classification of power system stability – Rotor angle stability - Swing equation - Swing curve - Power-Angle equation - Equal area criterion - Critical clearing angle and time - Classical step- by-step solution of the swing equation – modified Euler method.

TOTAL : 45 PERIODS

OUTCOMES:

- Ability to model the power system under steady state operating condition
- Ability to understand and apply iterative techniques for power flow analysis
- Ability to model and carry out short circuit studies on power system
- Ability to model and analyze stability problems in power system
- Ability to acquire knowledge on Fault analysis.
- Ability to model and understand various power system components and carry out power flow, short circuit and stability studies.

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TEXT BOOKS:

1. John J. Grainger, William D. Stevenson, Jr, 'Power System Analysis', Mc Graw Hill Education (India) Private Limited, New Delhi, 2015.
2. Kothari D.P. and Nagrath I.J., 'Power System Engineering', Tata McGraw-Hill Education, Second Edition, 2008.
3. Hadi Saadat, 'Power System Analysis', Tata McGraw Hill Education Pvt. Ltd., New Delhi, 21st reprint, 2010.

REFERENCES

1. Pai M A, 'Computer Techniques in Power System Analysis', Tata Mc Graw-Hill Publishing Company Ltd., New Delhi, Second Edition, 2007.
2. J. Duncan Glover, Mulukutla S.Sarma, Thomas J. Overbye, 'Power System Analysis & Design', Cengage Learning, Fifth Edition, 2012.
3. Gupta B.R., 'Power System - Analysis and Design', S. Chand Publishing, 2001.
4. Kundur P., 'Power System Stability and Control', Tata McGraw Hill Education Pvt. Ltd., New Delhi, 10th reprint, 2010.

21153C52 MICROPROCESSORS AND MICROCONTROLLERS

L	T	P	C
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OBJECTIVES:

To impart knowledge on the following Topics

- Architecture of μP8085 & μC 8051
- Addressing modes & instruction set of 8085 & 8051.
- Need & use of Interrupt structure 8085 & 8051.
- Simple applications development with programming 8085 & 8051

UNIT I 8085 PROCESSOR 9

Hardware Architecture, pinouts – Functional Building Blocks of Processor – Memory organization – I/O ports and data transfer concepts– Timing Diagram – Interrupts.

UNIT II PROGRAMMING OF 8085 PROCESSOR 9

Instruction -format and addressing modes – Assembly language format – Data transfer, data manipulation& control instructions – Programming: Loop structure with counting & Indexing – Look up tability - Subroutine instructions - stack.

UNIT III 8051 MICRO CONTROLLER 9

Hardware Architecture, pinouts – Functional Building Blocks of Processor – Memory organization – I/O ports and data transfer concepts– Timing Diagram – Interrupts- Data Transfer, Manipulation, Control Algorithms& I/O instructions, Comparison to Programming concepts with 8085.

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UNIT IV PERIPHERAL INTERFACING 9

Study on need, Architecture, configuration and interfacing, with ICs: 8255, 8259, 8254, 8279, - A/D and D/A converters &Interfacing with 8085& 8051.

UNIT V MICRO CONTROLLER PROGRAMMING & APPLICATIONS 9

Simple programming exercises- key board and display interface –Control of servo motor- stepper motor control- Application to automation systems.

OUTCOMES: **TOTAL : 45 PERIODS**

- Ability to acquire knowledge in Addressing modes & instruction set of 8085 & 8051.
- Ability to need & use of Interrupt structure 8085 & 8051.
- Ability to understand the importance of Interfacing
- Ability to explain the architecture of Microprocessor and Microcontroller.
- Ability to write the assembly language programme.
- Ability to develop the Microprocessor and Microcontroller based applications.

TEXT BOOKS:

1. Sunil Mathur &Jeebananda Panda, "Microprocessor and Microcontrollers", PHI Learning Pvt. Ltd, 2016.
2. R.S. Gaonkar, 'Microprocessor Architecture Programming and Application', with 8085, Wiley Eastern Ltd., New Delhi, 2013.
3. Muhammad Ali Mazidi & Janice Gilli Mazidi, R.D.Kinely 'The 8051 Micro Controller and Embedded Systems', PHI Pearson Education, 5th Indian reprint, 2003.

REFERENCES

1. Krishna Kant, "Microprocessor and Microcontrollers", Eastern Company Edition, Prentice Hall of India, New Delhi, 2007.
2. B.RAM," Computer Fundamentals Architecture and Organization" New age International Private Limited, Fifth edition, 2017.
3. Soumitra Kumar Mandal, Microprocessor & Microcontroller Architecture, Programming & Interfacing using 8085,8086,8051,McGraw Hill Edu,2013.
4. Ajay V.Deshmukh, 'Microcontroller Theory &Applications', McGraw Hill Edu,2016
5. Douglas V.Hall, 'Microprocessor and Interfacing', McGraw Hill Edu,2016.

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Electrical and Electronics Engineering
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21153L57 CONTROL AND INSTRUMENTATION LABORATORY

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OBJECTIVES:

- To provide knowledge on analysis and design of control system along with basics of instrumentation.

LIST OF EXPERIMENTS

CONTROLSYSTEMS:

1. P, PI and PID controllers
2. Stability Analysis
3. Modeling of Systems – Machines, Sensors and Transducers
4. Design of Lag, Lead and Lag-Lead Compensators
5. Position Control Systems
6. Synchro-Transmitter- Receiver and Characteristics
7. Simulation of Control Systems by Mathematical development tools

INSTRUMENTATION:

8. Bridge Networks –AC and DC Bridges
9. Dynamics of Sensors/Transducers

   (a) Temperature (b) pressure (c) Displacement (d) Optical (e) Strain (f) Flow

10 Power and Energy Measurement

11 Signal Conditioning

   (a) Instrumentation Amplifier

   (b) Analog – Digital and Digital –Analog converters (ADC and DACs)

12 Process Simulation

OUTCOMES: **TOTAL: 60 PERIODS**

- Ability to understand control theory and apply them to electrical engineering problems.
- Ability to analyze the various types of converters.
- Ability to design compensators
- Ability to understand the basic concepts of bridge networks.
- Ability to the basics of signal conditioning circuits.
- Ability to study the simulation packages.

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21153L34 **PROFESSIONAL DEVELOPMENT** **L T P C**
0 0 2 1

OBJECTIVES: The course aims to:

- Enhance the Employability and Career Skills of students
- Orient the students towards grooming as a professional
- Make them Employability Graduates
- Develop their confidence and help them attend interviews successfully.

UNIT I

Introduction to Soft Skills-- Hard skills & soft skills - employability and career Skills—Grooming as a professional with values—Time Management—General awareness of Current Affairs

UNIT II

Self-Introduction-organizing the material - Introducing oneself to the audience – introducing the topic – answering questions – individual presentation practice— presenting the visuals effectively – 5 minute presentations

UNIT III

Introduction to Group Discussion— Participating in group discussions – understanding group dynamics - brainstorming the topic — questioning and clarifying –GD strategies- activities to improve GD skills

UNIT IV

Interview etiquette – dress code – body language – attending job interviews– telephone/skype interview -one to one interview &panel interview – FAQs related to job interviews

UNIT V

Recognizing differences between groups and teams- managing time-managing stress- networking professionally- respecting social protocols-understanding career management-developing a long- term career plan-making career changes.

TOTAL : 30 PERIODS

OUTCOMES: At the end of the course Learners will be ability to:

- Make effective presentations
- Participate confidently in Group Discussions.
- Attend job interviews and be successful in them.
- Develop adequate Soft Skills required for the workplace

Recommended Software

1. **Globearena**
2. **Win English**

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21153C62 **PROTECTION AND SWITCHGEAR**

L	T	P	C
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OBJECTIVES:

To impart knowledge on the following Topics

- Causes of abnormal operating conditions (faults, lightning and switching surges) of the apparatus and system.
- Characteristics and functions of relays and protection schemes.
- Apparatus protection, static and numerical relays
- Functioning of circuit breaker

UNIT I PROTECTION SCHEMES 9

Principles and need for protective schemes – nature and causes of faults – types of faults – Methods of Grounding - Zones of protection and essential qualities of protection – Protection scheme

UNIT II ELECTROMAGNETIC RELAYS 9

Operating principles of relays - the Universal relay – Torque equation – R-X diagram – Electromagnetic Relays – Over current, Directional, Distance, Differential, Negative sequence and Under frequency relays.

UNIT III APPARATUS PROTECTION 9

Current transformers and Potential transformers and their applications in protection schemes - Protection of transformer, generator, motor, bus bars and transmission line.

UNIT IV STATIC RELAYS AND NUMERICAL PROTECTION 9

Static relays – Phase, Amplitude Comparators – Synthesis of various relays using Static comparators – Block diagram of Numerical relays – Over current protection, transformer differential protection, distant protection of transmission lines.

UNIT V CIRCUIT BREAKERS 9

Physics of arcing phenomenon and arc interruption - DC and AC circuit breaking – re-striking voltage and recovery voltage - rate of rise of recovery voltage - resistance switching - current chopping - interruption of capacitive current - Types of circuit breakers – air blast, air break, oil, SF6, MCBs, MCCBs and vacuum circuit breakers – comparison of different circuit breakers – Rating and selection of Circuit breakers.

OUTCOMES: **TOTAL : 45 PERIODS**

- Ability to understand and analyze Electromagnetic and Static Relays.
- Ability to suggest suitability circuit breaker.
- Ability to find the causes of abnormal operating conditions of the apparatus and system.

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21153L67 MICROPROCESSORS AND MICROCONTROLLERS LABORATORY

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OBJECTIVES:

- To provide training on programming of microprocessors and microcontrollers and understand the interface requirements.
- To simulate various microprocessors and microcontrollers using KEIL or Equivalent simulator.

LIST OF EXPERIMENTS

1. Simple arithmetic operations: addition / subtraction / multiplication / division.
2. Programming with control instructions:
   (i) Ascending / Descending order, Maximum / Minimum of numbers. (ii) Programs using Rotate instructions.
   (iii) Hex / ASCII / BCD code conversions.
3. Interface Experiments: with 8085
   (i) A/D Interfacing. & D/A Interfacing.
4. Traffic light controller.
5. I/O Port / Serial communication
6. Programming Practices with Simulators/Emulators/open source
7. Read a key ,interface display
8. Demonstration of basic instructions with 8051 Micro controller execution, including: (i) Conditional jumps & looping
   (ii) Calling subroutines.
9. Programming I/O Port and timer of 8051 (i) study on interface with A/D & D/A
   (ii) Study on interface with DC & AC motors
10. Application hardware development using embedded processors.

TOTAL: 60 PERIODS

OUTCOMES:

- Ability to understand and apply computing platform and software for engineering problems.
- Ability to programming logics for code conversion.
- Ability to acquire knowledge on A/D and D/A.
- Ability to understand basics of serial communication.
- Ability to understand and impart knowledge in DC and AC motor interfacing.
- Ability to understand basics of software simulators.

LIST OF EQUIPMENT FOR A BATCH OF 30 STUDENTS:

Sl.No.	Description of Equipment	Quantity required
1.	8085 Microprocessor Trainer with Power Supply	15
2.	8051 Micro Controller Trainer Kit with power supply	15
3.	8255 Interface boards	5
4.	8251 Interface boards	5

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5.	8259 Interface boards	5
6.	8279 Keyboard / Display Interface boards	5
7.	8254 timer/ counters	5
8.	ADC and DAC cards	5
9.	AC & DC motor with Controller s	5
10.	Traffic Light Control Systems	5

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HIGH VOLTAGE ENGINEERING

To impart knowledge on the following Topics

- Various types of over voltages in power system and protection methods.
- Generation of over voltages in laboratories.
- Measurement of over voltages.
- Nature of Breakdown mechanism in solid, liquid and gaseous dielectrics.
- Testing of power apparatus and insulation coordination

UNIT I OVER VOLTAGES IN ELECTRICAL POWER SYSTEMS 9

Causes of over voltages and its effects on power system – Lightning, switching surges and temporary over voltages, Corona and its effects – Bewley lattice diagram- Protection against over voltages.

UNIT II DIELECTRIC BREAKDOWN 9

Properties of Dielectric materials - Gaseous breakdown in uniform and non-uniform fields – Corona discharges – Vacuum breakdown – Conduction and breakdown in pure and commercial liquids, Maintenance of oil Quality – Breakdown mechanisms in solid and composite dielectrics- Applications of insulating materials in electrical equipments.

UNIT III GENERATION OF HIGH VOLTAGES AND HIGH CURRENTS 9

Generation of High DC voltage: Rectifiers, voltage multipliers, vandigraff generator: generation of high impulse voltage: single and multistage Marx circuits – generation of high AC voltages: cascaded transformers, resonant transformer and tesla coil- generation of switching surges – generation of impulse currents - Triggering and control of impulse generators.

UNIT IV MEASUREMENT OF HIGH VOLTAGES AND HIGH CURRENTS 9

High Resistance with series ammeter – Dividers, Resistance, Capacitance and Mixed dividers - Peak Voltmeter, Generating Voltmeters - Capacitance Voltage Transformers, Electrostatic Voltmeters – Sphere Gaps - High current shunts- Digital techniques in high voltage measurement.

UNIT V HIGH VOLTAGE TESTING & INSULATION COORDINATION 9

High voltage testing of electrical power apparatus as per International and Indian standards – Power frequency, impulse voltage and DC testing of Insulators, circuit breakers, bushing, isolators and transformers- Insulation Coordination& testing of cabilitys.

OUTCOMES: **TOTAL : 45 PERIODS**

- Ability to understand Transients in power system.
- Ability to understand Generation and measurement of high voltage.
- Ability to understand High voltage testing.

21153C72 **POWER SYSTEM OPERATION AND CONTROL** L T P C
3 0 0 3

OBJECTIVES:

To impart knowledge on the following topics

- Significance of power system operation and control.
- Real power-frequency interaction and design of power-frequency controller.
- Reactive power-voltage interaction and the control actions to be implemented for maintaining the voltage profile against varying system load.
- Economic operation of power system.
- SCADA and its application for real time operation and control of power systems

UNIT I PRELIMINARIES ON POWER SYSTEM OPERATION AND CONTROL 9

Power scenario in Indian grid – National and Regional load dispatching centers – requirements of good power system - necessity of voltage and frequency regulation - real power vs frequency and reactive power vs voltage control loops - system load variation, load curves and basic concepts of load dispatching - load forecasting - Basics of speed governing mechanisms and modeling - speed load characteristics - regulation of two generators in parallel.

UNIT II REAL POWER - FREQUENCY CONTROL 9

Load Frequency Control (LFC) of single area system-static and dynamic analysis of uncontrolled and controlled cases - LFC of two area system - tie line modeling - block diagram representation of two area system - static and dynamic analysis - tie line with frequency bias control – state variability model - integration of economic dispatch control with LFC.

UNIT III REACTIVE POWER – VOLTAGE CONTROL 9

Generation and absorption of reactive power - basics of reactive power control – Automatic Voltage Regulator (AVR) – brushless AC excitation system – block diagram representation of AVR loop - static and dynamic analysis – stability compensation – voltage drop in transmission line - methods of reactive power injection - tap changing transformer, SVC (TCR + TSC) and STATCOM for voltage control.

UNIT IV ECONOMIC OPERATION OF POWER SYSTEM 9

Statement of economic dispatch problem - input and output characteristics of thermal plant - incremental cost curve - optimal operation of thermal units without and with transmission losses (no derivation of transmission loss coefficients) - base point and participation factors method - statement of unit commitment (UC) problem - constraints on UC problem - solution of UC problem using priority list – special aspects of short term and long term hydrothermal problems.

UNIT V COMPUTER CONTROL OF POWER SYSTEMS 9

Need of computer control of power systems-concept of energy control centers and functions – PMU - system monitoring, data acquisition and controls - System hardware configurations - SCADA and EMS functions - state estimation problem – measurements and errors - weighted least square estimation - various operating states - state transition diagram.

21153P83PW	PROJECT WORK	L T P C 0 0 20 10

OBJECTIVES:

To develop the ability to solve a specific problem right from its identification and literature review till the successful solution of the same. To train the students in preparing project reports and to face reviews and viva voce examination.

The students in a group of 3 to 4 works on a topic approved by the head of the department under the guidance of a faculty member and prepares a comprehensive project report after completing the work to the satisfaction of the supervisor. The progress of the project is evaluated based on a minimum of three reviews. The review committee may be constituted by the Head of the Department. A project report is required at the end of the semester. The project work is evaluated based on oral presentation and the project report jointly by external and internal examiners constituted by the Head of the Department.

TOTAL: 300 PERIODS

OUTCOMES:

On Completion of the project work students will be in a position to take up any challenging practical problems and find solution by formulating proper methodology.

21153CEC -COMPS	0 0 2 2

Electric Circuits and Fields:

Network graph, KCL, KVL, node and mesh analysis, transient response of dc and ac networks; sinusoidal steady-state analysis, resonance, basic filter concepts; ideal current and voltage sources, Thevenin's, Norton's and Superposition and Maximum Power Transfer theorems, two-port networks, three phase circuits; Gauss Theorem, electric field and potential due to point, line, plane and spherical charge distributions; Ampere's and Biot-Savart's laws; inductance; dielectrics; capacitance.

Signals and Systems:

Representation of continuous and discrete-time signals; shifting and scaling operations; linear, time-invariant and causal systems; Fourier series representation of continuous periodic signals; sampling theorem; Fourier, Laplace and Z transforms.

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Electrical Machines:

Single phase transformer – equivalent circuit, phasor diagram, tests, regulation and efficiency; three phase transformers – connections, parallel operation; auto-transformer; energy conversion principles; DC machines – types, windings, generator characteristics, armature reaction and commutation, starting and speed control of motors; three phase induction motors – principles, types, performance characteristics, starting and speed control; single phase induction motors; synchronous machines – performance, regulation and parallel operation of generators, motor starting, characteristics and applications; servo and stepper motors.

Power Systems:

Basic power generation concepts; transmission line models and performance; cable performance, insulation; corona and radio interference; distribution systems; per-unit quantities; bus impedance and admittance matrices; load flow; voltage control; power factor correction; economic operation; symmetrical components; fault analysis; principles of over-current, differential and distance protection; solid state relays and digital protection; circuit breakers; system stability concepts, swing curves and equal area criterion; HVDC transmission and FACTS concepts.

Control Systems:

Principles of feedback; transfer function; block diagrams; steady-state errors; Routh and Niquist techniques; Bode plots; root loci; lag, lead and lead-lag compensation; state space model; state transition matrix, controllability and observability.

Electrical and Electronic Measurements:

Bridges and potentiometers; PMMC, moving iron, dynamometer and induction type instruments; measurement of voltage, current, power, energy and power factor; instrument transformers; digital voltmeters and multimeters; phase, time and frequency measurement; Q-meters; oscilloscopes; potentiometric recorders; error analysis.

Analog and Digital Electronics:

Characteristics of diodes, BJT, FET; amplifiers – biasing, equivalent circuit and frequency response; oscillators and feedback amplifiers; operational amplifiers – characteristics and applications; simple active filters; VCOs and timers; combinational and sequential logic circuits; multiplexer; Schmitt trigger; multi-vibrators; sample and hold circuits; A/D and D/A converters; 8-bit microprocessor basics, architecture, programming and interfacing.

Power Electronics and Drives:

Semiconductor power diodes, transistors, thyristors, triacs, GTOs, MOSFETs and IGBTs – static characteristics and principles of operation; triggering circuits; phase control rectifiers; bridge converters – fully controlled and half controlled; principles of choppers and inverters; basis concepts of adjustable speed dc and ac drives.

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21153E64A

ADVANCED CONTROL SYSTEM

LT P C
2 2 0 3

OBJECTIVES

i. To provide knowledge on design state feedback control and state observer.
ii. To provide knowledge in phase plane analysis.
iii. To give basic knowledge in describing function analysis.
iv. To study the design of optimal controller.
v. To study the design of optimal estimator including Kalman Filter

UNIT I STATE VARIABLE ANALYSIS 6+6

Introduction- concepts of state variables and state model-State model for linear continuous time systems, Diagonalisation- solution of state equations- Concepts of controllability and observability.

UNIT II STATE VARIABLE DESIGN 6+6

Introduction to state model: Effect of state feedback - Pole placement design: Necessary and sufficient condition for arbitrary pole placement, State regulator design Design of state observers- Separation principle- Design of servo systems: State feedback with integral control.

UNIT III SAMPLED DATA ANALYSIS 6+6

Introduction spectrum analysis of sampling process signal reconstruction difference equations The Z transform function, the inverse Z transform function, response of Linear discrete system, the Z transform analysis of sampled data control systems, response between sampling instants, the Z and S domain relationship. Stability analysis and compensation techniques.

UNIT IV NON LINEAR SYSTEMS 6+6

Introduction, common physical nonlinearites, The phase plane method: concepts, singular points, stability of non linear systems, construction of phase trajectories system analysis by phase plane method. The describing function method, stability analysis by describing function method, Jump resonance.

UNIT V OPTIMAL CONTROL 6+6

Introduction: Classical control and optimization, formulation of optimal control problem, Typical optimal control performance measures - Optimal state regulator design: Lyapunov equation, Matrix Riccati equation - LQR steady state optimal control – Application examples.

OUTCOMES:

TOTAL: 60 PERIODS

i. Able to design state feedback controller and state observer.
ii. Able to understand and analyse linear and nonlinear systems using phase plane method.
iii. Able to understand and analyse nonlinear systems using describing function method.
iv. Able to understand and design optimal controller.
v. Able to understand optimal estimator including Kalman Filter.
vi. Ability to apply advanced control strategies to practical engineering problems.

TEXT BOOKS:

1. M.Gopal, "Digital Control and State Variable Methods", 4th edition, Mc Graw Hill India, 2012
2. K. Ogata, 'Modern Control Engineering', 5th Edition, Pearson, 2012.
3. K. P. Mohandas, "Modern Control Engineering", Sanguine Technical Publishers, 2006.

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1. M.Gopal, Modern Control System Theory, 3rd edition, New Age International Publishers, 2014.
2. William S Levine, "Control System Fundamentals," The Control Handbook, CRC Press, Tayler and Francies Group, 2011.
3. Ashish Tewari, 'Modern Control Design with Matlab and Simulink', John Wiley, New Delhi, 2002.
4. T. Glad and L. Ljung, "Control Theory –Multivariable and Non-Linear Methods", Taylor & Francis, 2002.

Head of the Department
Electrical and Electronics Engineering
Ponnaiyah Ramajayam Institute of Science & Technology (PRIST)
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21153E65B

SPECIAL ELECTRICAL MACHINES

L	T	P	C
3	0	0	3

OBJECTIVES:

To impart knowledge on the following Topics

- Construction, principle of operation, control and performance of stepping motors.
- Construction, principle of operation, control and performance of switched reluctance motors.
- Construction, principle of operation, control and performance of permanent magnet brushless D.C. motors.
- Construction, principle of operation and performance of permanent magnet synchronous motors.
- Construction, principle of operation and performance of other special Machines.

UNIT I STEPPER MOTORS 9

Constructional features –Principle of operation –Types – Torque predictions – Linear Analysis – Characteristics – Drive circuits – Closed loop control – Concept of lead angle - Applications.

UNIT II SWITCHED RELUCTANCE MOTORS (SRM) 9

Constructional features –Principle of operation- Torque prediction–Characteristics Steady state performance prediction – Analytical Method – Power controllers – Control of SRM drive- Sensor less operation of SRM – Applications.

UNIT III PERMANENT MAGNET BRUSHLESS D.C. MOTORS 9

Fundamentals of Permanent Magnets- Types- Principle of operation- Magnetic circuit analysis- EMF and Torque equations- Power Converter Circuits and their controllers - Characteristics and control- Applications.

UNIT IV PERMANENT MAGNET SYNCHRONOUS MOTORS (PMSM) 9

Constructional features -Principle of operation – EMF and Torque equations - Sine wave motor with practical windings - Phasor diagram - Power controllers – performance characteristics - Digital controllers – Applications.

UNIT V OTHER SPECIAL MACHINES 9

Constructional features – Principle of operation and Characteristics of Hysteresis motor- Synchronous Reluctance Motor–Linear Induction motor-Repulsion motor- Applications

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21153E75A **DISASTER MANAGEMENT** **LT P C 3 0 0 3**

OBJECTIVES:

- To provide students an exposure to disasters, their significance and types.
- To ensure that students begin to understand the relationship between vulnerability, disasters, disaster prevention and risk reduction
- To gain a preliminary understanding of approaches of Disaster Risk Reduction (DRR)
- To enhance awareness of institutional processes in the country and
- To develop rudimentary ability to respond to their surroundings with potential disaster response in areas where they live, with due sensitivity

UNIT I INTRODUCTION TO DISASTERS 9

Definition: Disaster, Hazard, Vulnerability, Resilience, Risks – Disasters: Types of disasters – Earthquake, Landslide, Flood, Drought, Fire etc - Classification, Causes, Impacts including social, economic, political, environmental, health, psychosocial, etc.- Differential impacts- in terms of caste, class, gender, age, location, disability - Global trends in disasters: urban disasters, pandemics, complex emergencies, Climate change- Dos and Don'ts during various types of Disasters.

UNIT II APPROACHES TO DISASTER RISK REDUCTION (DRR) 9

Disaster cycle - Phases, Culture of safety, prevention, mitigation and preparedness community based DRR, Structural- nonstructural measures, Roles and responsibilities of- community, Panchayati Raj Institutions/Urban Local Bodies (PRIs/ULBs), States, Centre, and other stake-holders- Institutional Processes and Framework at State and Central Level- State Disaster Management Authority(SDMA)
– Early Warning System – Advisories from Appropriate Agencies.

UNIT III INTER-RELATIONSHIP BETWEEN DISASTERS AND DEVELOPMENT 9

Factors affecting Vulnerabilities, differential impacts, impact of Development projects such as dams, embankments, changes in Land-use etc.- Climate Change Adaptation- IPCC Scenario and Scenarios in the context of India - Relevance of indigenous knowledge, appropriate technology and local resources.

UNIT IV DISASTER RISK MANAGEMENT IN INDIA 9

Hazard and Vulnerability profile of India, Components of Disaster Relief: Water, Food, Sanitation, Shelter, Health, Waste Management, Institutional arrangements (Mitigation, Response and Preparedness, Disaster Management Act and Policy - Other related policies, plans, programmes and legislation – Role of GIS and Information Technology Components in Preparedness, Risk Assessment, Response and Recovery Phases of Disaster – Disaster Damage Assessment.

UNIT V DISASTER MANAGEMENT: APPLICATIONS AND CASE STUDIES AND FIELD WORKS 9

Landslide Hazard Zonation: Case Studies, Earthquake Vulnerability Assessment of Buildings and Infrastructure: Case Studies, Drought Assessment: Case Studies, Coastal Flooding: Storm Surge Assessment, Floods: Fluvial and Pluvial Flooding: Case Studies; Forest Fire: Case Studies, Man Made disasters: Case Studies, Space Based Inputs for Disaster Mitigation and Management and field works related to disaster management.

TOTAL: 45 PERIODS

OUTCOMES:

The students will be ability to ,

- Differentiate the types of disasters, causes and their impact on environment and society
- Assess vulnerability and various methods of risk reduction measures as well as mitigation.

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21153E81F **HUMAN VALUES & ETHICS** **LT P C**
3 0 0 3

OBJECTIVES:

- To enable the students to create an awareness on Engineering Ethics and Human Values, to instill Moral and Social Values and Loyalty and to appreciate the rights of others.

UNIT I HUMAN VALUES **10**

Morals, values and Ethics – Integrity – Work ethic – Service learning – Civic virtue – Respect for others – Living peacefully – Caring – Sharing – Honesty – Courage – Valuing time – Cooperation – Commitment – Empathy – Self confidence – Character – Spirituality – Introduction to Yoga and meditation for professional excellence and stress management.

UNIT II ENGINEERING ETHICS **9**

Senses of 'Engineering Ethics' – Variety of moral issues – Types of inquiry – Moral dilemmas – Moral Autonomy – Kohlberg's theory – Gilligan's theory – Consensus and Controversy – Models of professional roles - Theories about right action – Self-interest – Customs and Religion – Uses of Ethical Theories.

UNIT III ENGINEERING AS SOCIAL EXPERIMENTATION **9**

Engineering as Experimentation – Engineers as responsible Experimenters – Codes of Ethics – A Balanced Outlook on Law.

UNIT IV SAFETY, RESPONSIBILITIES AND RIGHTS **9**

Safety and Risk – Assessment of Safety and Risk – Risk Benefit Analysis and Reducing Risk - Respect for Authority – Collective Bargaining – Confidentiality – Conflicts of Interest – Occupational Crime – Professional Rights – Employee Rights – Intellectual Property Rights (IPR) – Discrimination.

UNIT V GLOBAL ISSUES **8**

Multinational Corporations – Environmental Ethics – Computer Ethics – Weapons Development – Engineers as Managers – Consulting Engineers – Engineers as Expert Witnesses and Advisors – Moral Leadership –Code of Conduct – Corporate Social Responsibility.

TOTAL: 45 PERIODS

OUTCOMES:

- Upon completion of the course, the student should be ability to apply ethics in society, discuss the ethical issues related to engineering and realize the responsibilities and rights in the society.

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21153E81G

PRINCIPLES OF MANAGEMENT

LT P C
3 0 0 3

OBJECTIVES:

- To enable the students to study the evolution of Management, to study the functions and principles of management and to learn the application of the principles in an organization.

UNIT I INTRODUCTION TO MANAGEMENT AND ORGANIZATIONS 9

Definition of Management – Science or Art – Manager Vs Entrepreneur - types of managers - managerial roles and skills – Evolution of Management – Scientific, human relations , system and contingency approaches – Types of Business organization - Sole proprietorship, partnership, company-public and private sector enterprises - Organization culture and Environment – Current trends and issues in Management.

UNIT II PLANNING 9

Nature and purpose of planning – planning process – types of planning – objectives – setting objectives – policies – Planning premises – Strategic Management – Planning Tools and Techniques – Decision making steps and process.

UNIT III ORGANISING 9

Nature and purpose – Formal and informal organization – organization chart – organization structure – types – Line and staff authority – departmentalization – delegation of authority – centralization and decentralization – Job Design - Human Resource Management – HR Planning, Recruitment, selection, Training and Development, Performance Management , Career planning and management.

UNIT IV DIRECTING 9

Foundations of individual and group behaviour – motivation – motivation theories – motivational techniques – job satisfaction – job enrichment – leadership – types and theories of leadership – communication – process of communication – barrier in communication – effective communication – communication and IT.

UNIT V CONTROLLING 9

System and process of controlling – budgetary and non-budgetary control techniques – use of computers and IT in Management control – Productivity problems and management – control and performance – direct and preventive control – reporting.

OUTCOMES:

TOTAL: 45 PERIODS

- Upon completion of the course, students will be ability to have clear understanding of managerial functions like planning, organizing, staffing, leading & controlling and have same basic knowledge on international aspect of management

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21153E82B C-PROGRAMMING-DATA STRUCTURES LT P C 3 0 0 3

OBJECTIVES:

- To understand the concepts of ADTs
- To Learn linear data structures – lists, stacks, and queues
- To understand sorting, searching and hashing algorithms
- To apply Tree and Graph structures

UNIT I LINEAR DATA STRUCTURES – LIST 9

Abstract Data Types (ADTs) – List ADT – array-based implementation – linked list implementation — singly linked lists- circularly linked lists- doubly-linked lists – applications of lists –Polynomial Manipulation – All operations (Insertion, Deletion, Merge, Traversal).

UNIT II LINEAR DATA STRUCTURES – STACKS, QUEUES 9

Stack ADT – Operations - Applications - Evaluating arithmetic expressions- Conversion of Infix to postfix expression - Queue ADT – Operations - Circular Queue – Priority Queue - deQueue – applications of queues.

UNIT III NON LINEAR DATA STRUCTURES – TREES 9

Tree ADT – tree traversals - Binary Tree ADT – expression trees – applications of trees – binary search tree ADT –Threaded Binary Trees- AVL Trees – B-Tree - B+ Tree - Heap – Applications of heap.

UNIT IV NON LINEAR DATA STRUCTURES - GRAPHS 9

Definition – Representation of Graph – Types of graph - Breadth-first traversal - Depth-first traversal – Topological Sort – Bi-connectivity – Cut vertex – Euler circuits – Applications of graphs.

UNIT V SEARCHING, SORTING AND HASHING TECHNIQUES 9

Searching- Linear Search - Binary Search. Sorting - Bubble sort - Selection sort - Insertion sort - Shell sort – Radix sort. Hashing- Hash Functions – Separate Chaining – Open Addressing – Rehashing – Extendible Hashing.

TOTAL: 45 PERIODS

OUTCOMES:

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

- Implement abstract data types for linear data structures.
- Apply the different linear and non-linear data structures to problem solutions.
- Critically analyze the various sorting algorithms.

TEXT BOOKS:

1. Mark Allen Weiss, "Data Structures and Algorithm Analysis in C", 2nd Edition, Pearson Education,1997.
2. Reema Thareja, "Data Structures Using C", Second Edition , Oxford University Press, 2011

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21153E82C	HIGH VOLTAGE DIRECT CURRENT TRANSMISSION	L	T	P	C
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OBJECTIVES: To impart knowledge about the following topics:

- Planning of DC power transmission and comparison with AC power transmission.
- HVDC converters.
- HVDC system control.
- Harmonics and design of filters.
- Power flow in HVDC system under steady state.

UNIT I INTRODUCTION 9

DC Power transmission technology–Comparison of AC and DC transmission–Application of DC transmission–Description of DC transmission system–Planning for HVDC transmission–Modern trends in HVDC technology–DC breakers–Operating problems– HVDC transmission based on VSC –Types and applications of MTDC systems.

UNIT II ANALYSIS OF HVDC CONVERTERS 9

Line commutated converter -Analysis of Graetz circuit with and without overlap -Pulse number– Choice of converter configuration – Converter bridge characteristics– Analysis of a 12 pulse converters– Analysis of VSC topologies and firing schemes.

UNIT III CONVERTER AND HVDC SYSTEM CONTROL 9

Principles of DC link control–Converter control characteristics–System control hierarchy– Firing angle control– Current and extinction angle control–Starting and stopping of DC link –Power control –Higher level controllers –Control of VSC based HVDC link.

UNIT IV REACTIVE POWER AND HARMONICS CONTROL 9

Reactive power requirements in steady state–Sources of reactive power–SVC and STATCOM– Generation of harmonics –Design of AC and DC filters– Active filters.

UNIT V POWER FLOW ANALYSIS IN AC/DC SYSTEMS 9

Per unit system for DC quantities–DC system model –Inclusion of constraints –Power flow analysis –case study

TOTAL : 45 PERIODS

OUTCOMES:

- Ability to understand the principles and types of HVDC system.
- Ability to analyze and understand the concepts of HVDC converters.
- Ability to acquire knowledge on DC link control.
- Ability to understand the concepts of reactive power management, harmonics and

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VALUE ADDED COURSE SYSLLABUS

215153EDD-PLC AND SCADA

Outcomes:

- The Most Used Guiding Force Behind an Automated Industrial Plant Is A "Programmable LogicController" 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 AutomatedManufacturing 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
- SCADA Introduction& Its

Session 2

- Detail study of PLC & SCADA
- PLC

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- SCADA
- PLC I/Os Basics, Burning & 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 RSLinx.
- 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 InTouch(SCADA)

COURSE DURATION: 45 Hours

215153CPO - COMPUTER APPLICATION IN POWER SYSTEM OPERATION AND PLANNING

Outcomes:

The course consists of two blocks, each consisting of a project assignment, lectures and exercise sessions. Block one includes analysis and modeling of the need for Information exchange for power system control. The aim is to train the students to analyze different perspectives on information necessary for power system control. The project assignment in the block includes implementation of a simple information model for the exchange of data on power systems. Block two includes basics in programming techniques and computer science focusing on machine learning methods with

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applications in power systems. The project assignment in the block consists of developing machine learning algorithms for forecasting.

SESSION -I

Models of power system components, network model using graph theory, formation of Z bus, transmissionline models, regulating transformer, line loadability, capability curves of alternator.

SESSION -II

Control of load bus voltage using reactive power control variable, SVC & SVS, Regulated shunt compensation, series and shunt compensation, Uniform series and shunt compensation and effect onloadability of transmission lines.

SESSION -III

Sensitivity analysis- General sensitivity relations, generation shift distribution factors, line outage distribution factors, compensated shift factors, sensitivity associated with voltage-VAR, sensitivities relating load bus voltage changes in terms of PV bus voltage changes, sensitivity relating changes in reactive power generation for changes in PV Bus Voltage.

SESSION -IV

Power system security – Security functions, Security level, contingency analysis, security control, economic dispatch using LP formulation, pre-contingency and post- contingency, corrective rescheduling.

SESSION -V

Voltage stability - Difference between voltage and angle stability, PV Curve for voltage stability assessment, proximity and mechanism, modal analysis using reduced Jacobian, participation factor, effect of series and shunt compensation on voltage stability , effect of load models.

COURSE DURATION: 45 Hours

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215153WI -WINDING OF INDUCTION MOTOR

Course Outcomes (COs):

- Apply the knowledge of basic principles and construction of AC machines for various industrial and house hold applications.
- Analyze the characteristics and performance of AC machines for a suitable application.
- Evaluate the performance of any AC machine for different loading conditions.
- Develop the equivalent circuit and phasor diagrams of any AC machine.

SYLLABUS

UNIT - I

3-Phase INDUCTION MOTORS: Polyphase induction motors-construction details of cage and wound rotor machines-production of a rotating magnetic field - principle of operation - rotor emf and rotor frequency - rotor reactance, rotor current and pf at standstill and during operation.

UNIT - II

CIRCLE DIAGRAM & SPEED CONTROL METHODS OF INDUCTION MOTORS: Circle diagramno load and blocked rotor tests-predetermination of performance-methods of starting and starting current and torque calculations.

UNIT – III

CONSTRUCTION AND PRINCIPLE OF OPERATION OF ALTERNATORS: Constructional Features of round rotor and salient pole machines, Armature windings, Integral slot and fractional slot windings; Distributed and concentrated windings, pitch and winding factors E.M.F Equation. Synchronous Generator Characteristics, Harmonics in generated E.M.F.

UNIT – IV

PARALLEL OPERATION OF SYNCHRONOUS GENERATOR: Synchronizing alternators with infinite bus bars, synchronizing power torque, parallel operation and load sharing. Effect of change of excitation and mechanical power input

UNIT - V

SINGLE PHASE MOTORS: Single phase Motors: Single phase induction motor, Constructional features-Double revolving field theory – Elementary idea of cross-field theory, splitphase motors, shaded pole motor. SPECIAL MOTORS: Principle & performance of A.C. Series motor, Universal motor. Principle of permanent magnet machines, stepper motors

COURSE DURATION: 45 Hours

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215153EPA - EMBEDDED PROGRAMMING USING ARDUINO

Objective:

An embedded system is a combination of hardware and software provided that both should be synchronized with each other. Some examples are as follows: industrial machines, automobiles, medical equipment, cameras, household appliances, airplanes, vending machines etc. The Arduino is an open-source computer hardware/software platform for building digital devices and interactive objects that can sense and control the physical world around them. In this course students will learn how the Arduino platform works in terms of the physical board and libraries and the IDE (Integrated Development Environment). The course will also cover programming the Arduino using C code and accessing the pins on the board via the software to control external devices.

Syllabus:

Embedded System design: Basics (45 hours)

i. Introduction to embedded systems.

ii. Components of embedded system.

iii. Advantages and applications of embedded systems.

iv. Examples of real time embedded systems and how they are manufactured industry ready.

v. Different Microcontroller Architectures (CISC, RISC, ARISC).

vi. Internal Resources & Hardware Chips in Details.

vii. History of AVR Microcontrollers and Features.

viii. Memory Architectures (RAM/ROM).

COURSE DURATION: 45 Hours

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SCHOOL OF ARTS AND SCIENCE

DEPARTMENT OF CHEMISTRY

DEPARTMENT ACADEMIC COMMITTEE MEETING CIRCULAR

Date: 05-05-2021

The Department Academic Committee Meeting will be held on **11-05-2021** at 11.00 am in the staff room, Department of Chemistry. All the staff members are requested to attend the meeting.

Agenda of the meeting:

Curriculum

Feedback

Academic Calendar

Department Activities

Others

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Dean of Arts & Science
PRIST Deemed to be University
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SCHOOL OF ARTS AND SCIENCE

DEPARTMENT OF CHEMISTRY

MINUTES OF THE DEPARTMENT ACADEMIC COMMITTEE MEETING

Date: 11-05-2022

The Department Academic Committee Meeting was held on 11-05-2021 at 11.00 pm. Dr.M.Jerome Rozario, Head of the Department, welcomed the committee members. Members analyzed the feedbacks from the stakeholders and the follow up actions taken. The committee carefully reviewed the curriculum in detail and proposed no changes in syllabus.

Staff members were asked to conduct department activities like conduct of seminar in the department seminar Hall. The workload was discussed and courses were allotted to the staff members.

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Department of Chemistry
PRIST Deemed to be University
Vallam, Thanjavur -613403

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SCHOOL OF ARTS AND SCIENCE
DEPARTMENT OF CHEMISTRY
BOARD OF STUDIES COMMITTEE MEETING CIRCULA

The Board of Studies Meeting will be held on 11.05.2022 at 11.00 am. All staff members are requested to attend the meeting without fail.

- **Agenda of the meeting:**
- **Curriculum Feedback Academic Calendar**
- Department Activities

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LIST OF MEMBERS 2021-2022

S.NO	NAME OF THE MEMBERS	DESIGNATION	SIGNATURE
1	Dr. S. Gomati	PROFESSOR /ACADAMIC EXPERT	
2	Mrs. Devi	INDUSTRIAL EXPERT	
3	Dr.L.CHINNAPPA	DEAN OF ARTS AND SCIENCE	
4	Dr. P. PARTHIBAN	PROFESSOR	
5	Dr. M. JEROME ROZARIO	PROFESSOR	
6	Dr. D. SENTHILNATHAN	ASSOCIATE PROFESSOR	
7	Dr. J.S. NIRMALRAM	ASSOCIATE PROFESSOR	
8	Dr. R.MANIKANDAN	ASSISTANT PROFESSOR	
9	Dr. D. CHINNARAJA	ASSISTANT PROFESSOR	
10	Dr. M. SURENDRA VARMA	ASSISTANT PROFESSOR	
11	Dr. A. JENIF D'SOUZA	ASSISTANT PROFESSOR	
12	Dr. N.V.PRABHU	ASSISTANT PROFESSOR	
13	Dr. J. THULASIDHASAN	ASSISTANT PROFESSOR	
14	Dr. C.R. SHANTHI	ASSISTANT PROFESSOR	
15	Dr. R. SHOPNA	ASSISTANT PROFESSOR	
15	Ms. V.ABARNA	ASSISTANT PROFESSOR	

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DEPARTMENT OF CHEMISTRY

MEETING OF BOARD OF STUDIES IN DEPARTMENT OF CHEMISTRY MINUTES OF THE MEETING

The Meeting of Board of Studies in the department of Chemistry was held on 11.05.2021 at 11.00 am under the Chairmanship of Prof.Dr.L.Chinnappa Dean, School of Arts and Science.

The following members were present:

Dr.L.Chinappa, Dean PRIST Deemed to be University,Chairman.
Dr. S. Kabilan (Academic Expert)- Professor of Chemistry, Annamalai University,TN.
Dr. P. Balamurugan (Industrial Expert) AGM- QC, Alembic Pharma,Gujarat
Dr. P. Parthiban
Dr. M. Jerome Rozario
Dr. D. Senthilnathan
Dr. J.S. Nirmalram
Dr. R Manikandan
Dr. D. Chinnaraja
Dr. M. Surendra Varma
Dr. A. Jenif d'souza
Dr. N.V.Prabhu
Dr. J. Thulasidhasan
Dr. C.R. Shanthi
Dr. R. Shopna
Ms. V.Abarna

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PRIST Deemed to be University
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The chairman of the board of studies welcomed the members.

The members of the Board scrutinized the existing syllabi for B.Sc Chemistry & M.Phil Chemistry programme and based on the Stakeholders feedback revision in the following Courses have been carried out.

1. It has been proposed to introduce Audit Courses in the B.Sc.(Chemistry) programme curriculum with effect from 2021-22 Based on the following courses are proposed to introduce during various semesters

   In Semester I: Universal Human Values
   In Semester II : Communication Skills
   In Semester III: Office automation-
   In Semester IV: Leadership and Management Skills
   In Semester V: Professional Skills

   The board resolved to approve the syllabus for the above mentioned Audit Courses

2. Based on feedback from the Alumni it has been proposed to introduce the following Audit Courses on Soft Skills in the B.Sc.(Chemistry) programme curriculum with effect from 2021-22

   Year I: Basic Behavioral Etiquette
   Year II : General Aptitude and Quantitative Ability
   Year III: Interview Skills Training and Mock Test

   The board further resolved to approve the syllabus of the above mentioned Audit Courses on Soft Skills.

3. There is a Plan of introducing Audit Course on "Community Engagement" in the 3rd year of B.Sc.(Chemistry) programme curriculum with effect from 2021-22

4. The board decided to drop the courses on Communicative English Laboratories,

5. The board decided to drop the courses on Skill Based Elective Courses- Package laboratories

6. The board decided to drop Course on Extension Activities from the existing curriculum

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of B.Sc.(Chemistry) programme with effect from 2021-22.

7. It is proposed to introduce a course on in moderation the syllabus the M.Phil.(Chemistry) programme curriculum with effect from 2022-23.

8. It was suggested to introduce phytochemical concepts in the syllabus of Phamacuetical Chemistry in 6th Semester of B.Sc (Chemistry)

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9. The committee recommended introduction of Green Chemistry in the Elective Course.

10. The members of the board also scrutinized and updated the panel of examiners for the B.Sc Chemistry & M.Sc Chemistry and submitted the same for the Academic Council for its approval.

Expert members accepted to introduce the courses as listed above.

Furthermore, the individual members offered their viewpoints.

The meeting was concluded with thanks from the chairman.

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SCHOOL OF ARTS OF SCIENCE

DEPARTMENT OF CHEMISTRY

B.Sc CHEMISTRY CURRICULUM

REGULATION 2020

Acadamic year 2021-2022

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SCHOOL OF ARTS AND SCIENCE

DEPARTMENT OF CHEMISTRY

B.Sc CURRICULUM – REGULATION 2020

B.Sc. Graduate Attributes

- Domain knowledge
- Critical thinking
- Effective Communication
- Reflective learning
- Critical thinking

B.Sc Programme Educational Objectives – PEO

- PE01- Acquired the knowledge with facts and figures related to various subjects in pure sciences .
- PE02- Understood the basic concepts, fundamental principles, and the scientific theories related to various scientific phenomena and their relevancies in the day-to-day life.
- PE03- Acquired the skills in handling scientific instruments, planning and performing in laboratory experiments.
- PE04- The skills of observations and drawing logical inferences from the scientific experiments.
- PE05- Analyzed the given scientific data critically and systematically and the ability to draw the objective conclusions.
- PE06- Been able to think creatively (divergently and convergent) to propose novel ideas in explaining facts and figures or providing new solution to the problems.
- PE07-Realized how developments in any science subject helps in the development of other science subjects and vice-versa and how interdisciplinary approach helps in providing better solutions and new ideas for the sustainable developments.
- PE08- Developed scientific outlook not only with respect to science subjects but also in all aspects related to life.
- PE09- Realized that knowledge of subjects in other faculties such as humanities, performing arts, social sciences etc.
- PE10- Can have greatly and effectively influence which inspires in evolving new scientific theories and inventions.
- PE11- Imbibed ethical, moral and social values in personal and social life leading to highly cultured and

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civilized personality.

- PE12- Developed various communication skills such as reading, listening, speaking, etc., which we will help in expressing ideas and views clearly and effectively.
- PE13- Realized that pursuit of knowledge is a lifelong activity and in combination with untiring efforts and positive attitude and other necessary qualities leads towards a successful life.

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B.Sc Programme Outcome – PO

- PO1- To understand basic facts and concepts in Chemistry while retaining the exciting aspects of Chemistry so as to develop interest in the study of chemistry as a discipline.
- PO2- To develop the ability to apply the principles of Chemistry.
- PO3- To appreciate the achievements in Chemistry and to know the role of Chemistry in nature and in society. To develop problem solving skills.
- PO4- To be familiarised with the emerging areas of Chemistry and their applications in various spheres of Chemical sciences and to apprise the students of its relevance in future studies.
- PO5- To develop skills in the proper handling of apparatus and chemicals.
- PO6- To be exposed to the different processes used in industries and their applications.

B.Sc. Course – C

- C1- General Chemistry – I
- C2- Volumetric Analysis Lab
- C3- Mathematics – I
- C4- Mathematics – II
- C5- General Chemistry – II
- C6- Organic Analysis Lab
- C7- Mathematics - III
- C8- Mathematics – IV
- C9- Research Led Seminar
- C10- General Chemistry – III
- C11- Physical Chemistry Lab – I
- C12- Physics - I & II
- C13- Physics Lab – I & II
- C14- Research Methodology
- C15- General Chemistry - IV
- C16- Physical Chemistry Lab – II
- C17- Inorganic Chemistry – I
- C18- Organic Chemistry – I
- C19- Physical Chemistry – I
- C20- Inorganic Qualitative Analysis Lab
- C21- Gravimetric Analysis Lab
- C22-Participation in Bounded Research
- C23- Inorganic Chemistry – II

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- C24- Organic Chemistry – II
- C25- Physical Chemistry – II
- C26- Project Work
- C27- Package Lab I to VI
- C28- Communication Lab I to VI

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B.Sc Curriculum Mapping

Programme Educational Objectives Vs Programme Outcome

Programme Outcome-PO Programme Educational Outcome - PEO	PO1	PO2	PO3	PO4	PO5	PO6
PE01	✓					
PE02						
PE03		✓				
PE04			✓			
PE05						
PE06					✓	
PE07				✓		
PE08						✓
PE09	✓			✓		
PE10		✓	✓			
PE11						
PE12				✓		
PE13	✓		✓		✓	

B.Sc Curriculum Mapping

Programme Outcome vs Courses Outcome

Programme Outcome-PO Courses Outcome-CO	PO1	PO2	PO3	PO4	PO5	PO6
CO1			*	*		*
CO2		*		*	*	*
CO3	*	*			*	
CO4			*	*		*
CO5			*	*		*
CO6		*		*	*	*
CO7	*	*			*	
CO8		*	*		*	
CO9	*	*			*	*
CO10		*	*	*		*
CO11		*		*	*	
CO12	*	*		*	*	
CO13		*	*	*	*	

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CO14		*	*	*	*	*
CO15	*		*		*	
CO16		*		*		*
CO17	*		*		*	
CO18		*		*	*	
CO19	*	*		*		*
CO20			*	*	*	
CO21	*		*	*		*

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CO22	*	*		*		*
CO23			*	*	*	
CO24	*	*	*		*	*
CO25	*	*		*		*
CO26	*	*		*	*	
CO27		*	*	*		
CO28	*	*			*	

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SCHOOL OF ARTS AND SCIENCE

DEPARTMENT OF CHEMISTRY

B.Sc CHEMISTRY – REGULATION 2020

COURSE STRUCTURE

SEMESTER – I					
COURSE CODE	COURSE TITLE	L	T	P	C
20110AEC11/ 20111AEC11/ 20132AEC11/ 20135AEC11	Tamil – I / Advanced English – I / Hindi – I / French-I	4	0	0	2
20111AEC12	English – I	4	0	0	2
20114AEC13	General Chemistry – I	6	0	0	4
20114AEC14L	Volumetric Analysis Lab	0	0	3	2
20112AEC15A (OR) 20114AEC17	Calculus and Fourier Series	5	0	0	4
	General and Applied Botany –I	6	0	0	6
20112AEC16A (OR) 20114AEC18L	Algebra and Trigonometry	4	0	0	3
	General Botany Lab –I	0	0	3	2
201INDCONS	Indian Constitution	0	0	0	0
	Universal Human Values	-	-	-	2
	Total	**29**	**0**	**06**	**19**

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SEMESTER – II					
20110AEC21/ 20111AEC21/ 20131AEC21/ 20135AEC21	Tamil – II / Advanced English – I I / Hindi – II / French-II	4	0	0	2
20111AEC22	English – II	4	0	0	2
20114AEC23	General Chemistry – II	6	0	0	4

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20114AEC24L	Organic Analysis Lab	0	0	3	2
20112AEC25A (OR)	ODE, PDE and Laplace Transform	5	0	0	4
20114AEC29A	General and Applied Botany –II	6	0	0	6
20112AEC26A	Analytical Geometry in Vector Calculus	4	0	0	3
20114AEC20L	General Botany Lab –II	0	0	3	2
20114RLC27	Research Led Seminar	–	–	–	1
	Communication Skills	-	-	-	2
	Basic Behavioral Etiquette	-	-	-	2
	Total	**29**	**0**	**06**	**22**
	SEMESTER – III				
20110AEC31/ 20111AEC31/ 20131AEC31/ 20135AEC31	Tamil – III / Advanced English – II I / Hindi – III / French-III	4	0	0	2
20111AEC32	English – III	4	0	0	2
20114AEC33	General Chemistry – III	5	0	0	4
20114AEC34L	Physical Chemistry – Non – Electrical Practical	0	0	3	2
20113AEC35	Physics – I	6	0	0	5
20113AEC36L	Physics Lab – I	0	0	3	2
20114RMC37	Research Methodology	2	0	0	2
	Office automation	-	-	-	2
	Total	21	0	06	21
	SEMESTER – IV				
20110AEC41/ 20111AEC41/ 20131AEC41/ 20135AEC41	Tamil – IV / Advanced English – IV / Hindi – IV / French-IV	4	0	0	2
20111AEC42	English-IV	4	0	0	2
20114AEC43	General Chemistry – IV	5	0	0	4
20114AEC44L	Physical Chemistry – Electrical Practical	0	0	3	2
20113AEC45	Physics – II	6	0	0	5
20113AEC46L	Physics Lab – II	0	0	3	2
201ENVTSTU	Environmental Studies	2	-	-	2
	Leadership and Management Skills	-	-	-	2

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	General Aptitude and Quantitative Ability	-	-	-	2
	Total	**21**	**0**	**06**	**23**
SEMESTER – V					
20114AEC51	Inorganic Chemistry – I	5	0	0	4

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20114AEC52	Organic Chemistry – I	4	1	0	3
20114AEC53	Physical Chemistry	4	1	0	4
20114AEC54L	Inorganic Qualitative Analysis Lab	0	0	3	2
20114AEC55L	Gravimetric Analysis Lab	0	0	3	2
20114DSC56_	Discipline Specific Elective –I	5	0	0	3
20114BRC57	Participation in Bounded Research	-	-	-	1
	Professional Skills	-	-	-	2
	Interview Skills Training and Mock Test	-	-	-	2
	Total	**18**	**02**	**06**	**23**
SEMESTER – VI					
20114AEC61	Inorganic Chemistry – II	4	1	0	4
20114AEC62	Organic Chemistry – II	5	0	0	5
20114AEC63L	Industrial Chemistry Practical	0	0	3	2
20114AEC64L	Domestic Products Preparation - Practical	0	0	3	2
20114DSC65_	Discipline Specific Elective – II	5	0	0	3
201__OEC66_	Open Elective	4	0	0	2
20114PRW67	Project Work	0	0	0	4
	Community Engagement	-	-	-	1
20114PEE	Programme Exit Examination	0	0	0	1
	Total	18	01	06	24
	Total Credits of the Program				132

DISCIPLINE SPECIFIC ELECTIVE COURSES – I & II

Semester	Elective No.	Course Code	Course Title
V	I	20114DSC56A 20114DSC56B	A) Pharmaceutical Chemistry B) Agricultural Chemistry
VI	II	20114DSC65A 20114DSC65B	A) Polymer Chemistry B) Nano Science

OPEN ELECTIVE COURSES

Semester	Course code	Course Title
	20110OEC	Tamil Ilakkiya Varalaru

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VI	20111OEC	Journalism
	20112OEC	Development of Mathematical Skills
	20113OEC	Instrumentation
	20116OEC	Wildlife Conservation
	20120OEC	E-Learning
	20120OEC	Web Technology
	20161OEC	Banking Service

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RESEARCH BASED COURSES

Semester	Course Code	Course Title
II	20114RLC27	Research Led Seminar
III	20114RMC37	Research Methodology
IV	20114BRC57	Participation in Bounded Research

AUDIT COURSES

Semester	Course Code	Course Title
I		Universal Human Values
II		Communication Skills
II		Basic Behavioral Etiquette
III		Office automation
IV		Leadership and Management Skills
IV		General Aptitude and Quantitative Ability
V		Professional Skills
V		Interview Skills Training and Mock Test
VI		Community Engagement

CREDIT DISTRIBUTION

SEMESTER	AEC	DSC	OEC	RESEARCH	OTHERS	TOTAL
I	17	-	-	-	02	19
II	17	-	-	01	04	22
III	17	-	-	02	02	21
IV	17	-	-	-	06	23
V	15	03	-	01	04	23

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VI	13	03	02	04	02	24
TOTAL	96	06	02	08	20	132

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LIST OF MEMBERS

S.NO	NAME OF THE MEMBERS	DESIGNATION	SIGNATURE
1	Dr. S. Gomati	PROFESSOR /ACADAMIC EXPERT	
2	Mrs. Devi	INDUSTRIAL EXPERT	
3	Dr.L.CHINNAPPA	DEAN OF ARTS AND SCIENCE	
4	Dr. P. PARTHIBAN	PROFESSOR	
5	Dr. M. JEROME ROZARIO	PROFESSOR	
6	Dr. D. SENTHILNATHAN	ASSOCIATE PROFESSOR	
7	Dr. J.S. NIRMALRAM	ASSOCIATE PROFESSOR	
8	Dr. R MANIKANDAN	ASSISTANT PROFESSOR	
9	Dr. D. CHENNARAJA	ASSISTANT PROFESSOR	
10	Dr. M. SURENDRA VARMA	ASSISTANT PROFESSOR	
11	Dr. A. JENIFFDSOUZA	ASSISTANT PROFESSOR	
12	Dr. N.V.PRABHU	ASSISTANT PROFESSOR	
13	Dr. J. THULASIDHASAN	ASSISTANT PROFESSOR	
14	Dr. C.R. SHANTHI	ASSISTANT PROFESSOR	
15	Dr. R. SHOPNA	ASSISTANT PROFESSOR	
15	Ms. V.ABARNA	ASSISTANT PROFESSOR	

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SCHOOL OF ARTS AND SCIENCE

DEPARTMENT OF CHEMISTRY

M.Sc CHEMISTRY – REGULATION 2020

COURSE STRUCTURE

M.Sc. Graduate Attributes

- Domain knowledge
- Investigative
- Critical thinking
- Resourceful and Responsible
- Effective Communication
- Ethical and Moral values

M.Sc. Programme Educational Objective – PEO

- PEO1-To demonstrate broad knowledge of descriptive Chemistry.
- PEO2-To impart the basic analytical and technical skills to work effectively in the various fields of chemistry.
- PE03- To motivate critical thinking and analysis skills to solve complex chemical problems, e.g., analysis of data, synthetic logic, spectroscopy, structure and modeling, team-based problem solving, etc.
- PEO4-To demonstrate an ability to conduct experiments in the above sub-disciplines with mastery of appropriate techniques and proficiency using core chemical instrumentation and modeling methods.
- PEO5-To demonstrate the ability to perform accurate quantitative measurements with an understanding of the theory and use of contemporary chemical instrumentation, interpret

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experimental results, perform calculations on these results and draw reasonable, accurate conclusions.

- PEO6-To develop skills in quantitative modeling of static and dynamic chemical systems.
- PEO7-To develop laboratory competence in relating chemical structure to spectroscopic phenomena.
- PEO8-To demonstrate the ability to synthesize, separate and characterize compounds using published reactions, protocols, standard laboratory equipment, and modern instrumentation.

M.Sc Programme Outcome –PO

- PO1-Think critically and analyze chemical problems.
- PO2-Present scientific and technical information resulting from laboratory experimentation in both written and oral formats.
- PO3-Work effectively and safely in a laboratory environment.
- PO4-Use technologies/instrumentation to gather and analyze data.
- PO5-Work in teams as well as independently.
- PO6-Apply modern methods of analysis to chemical systems in a laboratory setting.

M.Sc Course -C

- C1-Organic Chemistry-I
- C2-Inorganic Chemistry-I
- C3-Physical Chemistry-I
- C4-Research Led Seminar
- C5-Organic Chemistry-II
- C6-Inorganic Chemistry-II
- C7-Physical Chemistry-II
- C8-Research Methodology
- C9-Participation in Bounded Research
- C10-Organic Chemistry-III
- C11-Inorganic Chemistry-III
- C12-Physical Chemistry-III
- C13- Participation in Scaffold Research
- C14-Project Work

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M.Sc Curriculum Mapping

Programme Educational Objectives Vs Programme Outcome

Programme Outcome-PO Programme Educational Outcome - PEO	PO1	PO2	PO3	PO4	PO5	PO6
PE01	✓					
PE02						
PE03		✓				
PE04			✓			
PE05						
PE06					✓	
PE07				✓		
PE08						✓

M.Sc Curriculum Mapping

Programme Outcome vs Courses Outcome

Programme Outcome-PO Courses Outcome-CO	PO1	PO2	PO3	PO4	PO5	PO6
CO1			*	*		*
CO2		*		*	*	*

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CO3	*	*			*	
CO4			*	*		*
CO5			*	*		*
CO6		*		*	*	*
CO7	*	*			*	
CO8		*	*		*	
CO9	*	*			*	*
CO10		*	*	*		*
CO11		*		*	*	
CO12	*	*		*	*	
CO13		*	*	*	*	
CO14		*	*	*	*	*

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COURSE STRUCTURE

SEMESTER - I					
COURSE CODE	**COURSE TITLE**	**L**	**T**	**P**	**C**
20214SEC11	Organic Chemistry-I	5	0	0	4
20214SEC12	Inorganic Chemistry-I	5	0	0	4
20214SEC13	Physical Chemistry-I	5	0	0	4
20214SEC14L	Organic Chemistry Lab-I	0	0	5	2
20214SEC15L	Inorganic Chemistry Lab-I	0	0	5	2
20214DSC16_	Discipline Specific Elective-I	5	0	0	4
20214RLC17	Research Led Seminar	-	-	-	1
	Total	**20**	**-**	**10**	**21**
SEMESTER - II					
20214SEC21	Organic Chemistry-II	4	0	0	4
20214SEC22	Inorganic Chemistry-II	4	0	0	4
20214SEC23	Physical Chemistry-II	4	0	0	4
20214SEC24L	Organic Chemistry Lab-II	0	0	5	2
20214SEC25L	Inorganic Chemistry Lab-II	0	0	5	2

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20214DSC26_	Discipline Specific Elective-II	5	0	0	4
20214RMC27	Research Methodology	3	0	0	2
20214BRC28	Participation in Bounded Research	-	-	-	2
	Total	**20**	**-**	**10**	**24**
	SEMESTER - III				
20214SEC31	Organic Chemistry-III	5	0	0	5
20214SEC32	Inorganic Chemistry-III	5	0	0	5
20214DSC35_	Discipline Specific Elective-III	5	0	0	4
20214SEC33L	Physical Chemistry Lab-I	-	0	5	3
20214SEC34L	Physical Chemistry Lab-II	-	0	5	3
202__OEC36	Open Elective	4	0	0	2
20214SRC37	Participation in Scaffold Research (Design and Societal Project)	-	-	-	2
	Total	19	0	10	24
	SEMESTER - IV				
20214SEC41	Physical Chemistry-III	6	1	0	6
20214SEC32	Industrial Chemistry	6	1	0	5
20214DSC43_	Discipline Specific Elective-IV	5	0	0	4
20214PRW44	Project	-	-	-	10
20214PEE	Programme Exit Examination	-	-	-	2
	Total	**17**	**2**	**0**	**27**
	Total Credits of this Program				**96**

DISCIPLINE SPECIFIC ELECTIVE COURSES –I

Semester	Elective No.	Course Code	Course Title

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I	I	20214DSC16A	a) Environmental Chemistry
		20214DSC16B	b) Supramolecular Chemistry

DISCIPLINE SPECIFIC ELECTIVE COURSES –II

Semester	Elective No.	Course Code	Course Title
II	II	20214DSC26A	a) Special Topics in Chemistry
		20214DSC26B	b) Macromolecules as Engineering Materials.

DISCIPLINE SPECIFIC ELECTIVE COURSES –III

Semester	Elective No.	Course Code	Course Title
III	III	20214DSC35A	a) Medicinal Chemistry
		20214DSC35B	b) Green Organic Synthesis: Principles and Applications

DISCIPLINE SPECIFIC ELECTIVE COURSES –IV

Semester	Elective No.	Course Code	Course Title
IV	IV	20214DSC43A	a) Nano Chemistry
		20214DSC43B	b) Material Chemistry

OPEN ELECTIVE COURSES

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Semester	Course Code	Course Title
III	20211OEC	Writing for the Media
	20212OEC	Applicable Mathematical Techniques
	20213OEC	Biomedical Instrumentation
	20215OEC	Herbal Medicines
	20220OEC	M-Marketing
	20261OEC	Financial Service
	20280OEC	Counselling and Psychology

CREDIT DISTRIBUTION

SEMESTER	SEC	GEC	DSE	RESEARCH	OTHERS	TOTAL
I	16	-	04	01		21
II	16	-	04	04		24
III	16	02	04	02		24
IV	11	-	04	10	02	27
TOTAL	59	02	16	17	02	96

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Course Code	Course Title	L	T	P	C
20114DSC56A		0	0	4	4
	PHARMACEUTICAL CHEMISTRY				
Course Outline	**UNIT-I: Physical properties in Pharmaceuticals:** Physical properties of drug molecule: physical properties.Refractive index- Definition, explanation, formula, importance, determination, specific & molar refraction. Optical activity\rotation- monochromatic & polychromatic light, optical activity, angle of rotation, specific rotation examples, measurement of optical activity. Dielectric constant & Induced Polarization- Dielectric constant explanation & determination.Rheology of pharmaceutical systems: Introduction, Definition, Applications, concept of viscosity, Newton's law offlow, Kinematic, Relative, Specific, Reduced & Intrinsic viscosity. Newtonian system, non-Newtonian system- Plastic flow, Pseudoplastic flow, Dilatent flow. Viscosity measurements- selection of viscometer for Newtonian and non-Newtonian system.				
	UNIT-II:Isotopic Dilution analysis: principle andapplications, Neutron activation analysis: Principle, advantages and limitations,Scintillation counters:Body scanning.Introduction to radiopharmaceuticals.Properties of various types of radiopharmaceuticals, Radiopharmaceuticals as diagnostics, as therapeutics, for research and sterilization.Physico Chemical Properties and drug action. Physico chemical properties of drugs (a) Partition coefficient, (b) solubility (c) surface activity, (d) degree of ionization.				
	UNIT-III: Drug dosage and product development: Introduction to drug dosage Forms & Drug Delivery system – Definition of Commonterms. Drug Regulation and control,pharmacopoeias formularies, sources of drug, drug nomenclature, routes of administration of drugs products, need for a dosage form, classification of dosage forms. Drug dosage and product development. Introduction to drug dosage Forms & Drug Delivery system – Definition of Common terms. Drug Regulation and control,pharmacopoeias formularies, sources of drug, drug nomenclature, routes of administration of drugs products, need for a dosage form, classification of dosage forms.				

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	UNIT-IV:Development of new drugs: Introduction,procedure followed in drug design, theresearch for lead compounds, molecular modification of lead compounds. Structure-Activity Relationship (SAR): Factorseffecting bioactivity, resonance, inductive effect,isoterism, bioisosterism, spatial considerations,biological properties of simple functional groups,theories of drug activity, occupancy theory, ratetheory, induced-fit theory,4.3Quantitative structure activity relationship(QSAR): Development of QSAR, drug receptor interactions, the additivity of group contributions, physico-chemical parameters, lipophilicity parameters, electronic parameter, ionizationconstants, steric parameters, chelation parameters, redox potential, indicator-variables.	
	UNIT-V:Computers in Pharmaceutical Chemistry: Need of computers for chemistry. Computers for Analytical Chemists-Introduction to computers: Organization of computers, CPU, Computer memory, I/Odevices, information storage, softwware components. Application of computers in chemistry: Programming in high level language (C+) to handle various numerical methods in chemistry – least square fit, solution to simultaneous equations, interpolation, extrapolation, data smoothing, numerical differentiation andintegrations.	
Extended Professional Component (is a part of internal component only, Not to be included in the external examination question paper)	Questions related to the above topics, from various competitive examinations UPSC / TRB / NET/ UGC-CSIR / GATE /TNPSC others to be solved (To be discussed during the Tutorial hours)	
Skills acquired from this course	Knowledge, Problem solving, Analytical ability, Professional Competency, Professional Communication and Transferable skills.	

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Recommended Text	1. Physical Chemistry- Bahl and Tuli. 2. Text Book of Physical Pharmaceutics, IInd edition, Vallabh Prakashan-.C.V.S. Subramanyam. 3. Medicinal Chemistry (Organic Pharmaceutical Chemistry), G.R Chatwal, Himalaya Publishing house. 4. Instrumental method of Analysis: Hubert H, Willard,7th edition. 5. Textbook of Pharmaceutical Chemistry by,Jayshree Ghosh, S. Chand & company Ltd.Pharmaceutical Chemistry by Dr. S. Lakshmi, Sultanchand & Sons.	
Reference Books	1. Computers in chemistry, K.V. Raman, Tata Mc.Graw-Hill, 1993. 2. Computers for Chemists, S.K Pundir, Anshu bansal, A pragate prakashan., 2 nd edition, New age international (P) limited, New Delhi. 3. Physical Pharmacy and Pharmaceutical Sciences by Martins, Patrick J. Sinko, Lippincott. William and Wilkins. 4. Cooper and Gunn's Tutorial Pharmacy ,6th edition by S.J. Carter, CBS Publisher Ltd. 5. Ansels pharmaceutical Dosage forms and Drug Delivery System by Allen Popvich and Ansel, Indian edition-B.I. Publication Pvt. Ltd.	
Website and e-learning source	https://www.ncbi.nlm.nih.gov/books/NBK482447/ https://training.seer.cancer.gov/treatment/chemotherapy/types.html	

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Course Code	Course Title	L	T	P	C

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20114DSC56B	Phytochemistry	4	1	0	3
Course Outline	**UNIT-I:Pharmacognosy and Standardization of Herbal drugs:** Introduction, definition, development classification and Source of Drugs: Biological, mineral, marine,and plant tissue cultures. Study of pharmacognosticof a crude drug. Biosynthesis: Shikimic acid pathway and acetate pathway. Systematic analysis of Crude drugs. Standardization of Herbal drugs.WHO guidelines. Sampling of crude drug. Methods of drug evaluation. Determination of foreign matter, moisture Ash value. Phytochemical investigations-General chemical tests.				
	UNIT-II:Extraction Techniques: General methods of extraction, types – maceration, Decoction, percolation, Immersion and soxhlet extraction. Advanced techniques- counter current, steam distillation, supercritical gases, sonication, Micro waves assisted extraction. Factors affecting the choice of extraction process.				

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	UNIT-III:Drugs containing Terpenoids and volatile oils: Terpenoids: Classification, Isoprene rule, Isolation and separation techniques, General properties Camphor, Menthol, Eucalyptol. Volatile Oils or Essential Oils: Method of Preparations, Classifications of Volatile oils, Camphor oil, Geranium oil, Citral- Structure uses. Pentacyclic triterpenoids: amyrines; taraxasterol: Structure and pharmacological applications.	
	UNIT-IV:Drugs containing alkaloids: Occurrence,function of alkaloids in plants, pharmaceutical applications. Isolation, Preliminary Qualitative tests and general properties. General methods of structural elucidation. Morphine, Reserpine, papaverine - chemical properties,structure and uses. papaverine-structure, chemical properties and uses.	
	UNIT-V:Plant Glycosides and Marine drugs: Glycosides: Basic ring system, classification, isolation, properties, qualitative analysis. Pharmacological activity of Senna glycosides, Cardiacglycosides-Digoxin, digitoxin, Steroidal saponins glycosides-Diosgenin, hecogenin. Plant pigments: Occurrence and general methods of structure determination, isolation and synthesis of quercetin and cyanidin chloride.Marine drugs -Selected Drug Molecules: Cardiovascular active substances, Cytotoxic compounds, antimicrobial compounds, antibiotic compounds, Anti-inflammatory agents. Marine toxins.	

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Extended Professional Component (is a part of internal component only, Not to be included in the external examination question paper)	Questions related to the above topics, from various competitive examinations UPSC / TRB / NET/ UGC-CSIR / GATE /TNPSC others to be solved (To be discussed during the Tutorial hours)	
Skills acquired from this course	Knowledge, Problem solving, Analytical ability, Professional Competency, Professional Communication and Transferable skills.	
Recommended Text	1. Gurdeep R Chatwal (2016), Organic chemistry of Natural products, Volume I&II, 5th edition, Himalaya publishing House. 2. S.V.Bhat, B.A. Nagasampagi, M.Sivakumar (2014), Chemistry of Natural Products, Revised edition, Narosa Publishers.	
Reference Books	1. Jeffrey B. Harborne (2012), Phytochemical methods: A Guide to Modern Techniques of Plant Analysis, 4th edition, Indian reprint, Springer. 2. Ashutoshkar (2007), Pharmacognosy and Pharmacobiotechnology, 2 nd edition, New age international (P) limited, New Delhi.	

Course Code	Course Title	L	T	P	C
20114DSC56C	/Green Chemistry	0	0	4	4

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Course Outline	**UNIT-I:Introduction to receptors:** Introduction, targets, Agonist, antagonist, partial agonist.Receptors, Receptor types, Theories of Drug – receptor interaction, Drug synergism, Drug resistance, physicochemical factors influencing drug action.	
	UNIT-II:Antibiotics: Introduction, Targets of antibiotics action, classification of antibiotics, enzyme-based mechanism of action, SAR of penicillins and tetracyclins, clinical application of penicillins, cephalosporin.Current trends in antibiotic therapy.	
	UNIT-III:Antihypertensive agents and diuretics: Classification of cardiovascular agents, introduction to hypertension, etiology, types, classification of antihypertensive agents, classification and mechanism of action of diuretics, Furosemide, Hydrochlorothiazide, Amiloride.	
	UNIT-IV:Antihypertensive agents and diuretics: Classification of cardiovascular agents, introduction to hypertension, etiology, types, classification of antihypertensive agents, classification and mechanism of action of diuretics, Furosemide, Hydroehlorothiazide, Amiloride.	
	UNIT-V: Analgesics, Antipyretics and Anti-inflammatory Drugs: Introduction, Mechanism of inflammation, classification and mechanism of action and paracetamol, Ibuprofen, Diclofenac, naproxen, indomethacin, phenylbutazone and meperidine. Medicinal Chemistry of Antidiabetic Agents Introduction, Types of diabetics, Drugs used for the treatment, chemical classification, Mechanism of action, Treatment of diabetic mellitus. Chemistry of insulin, sulfonyl urea.	
Extended Professional Component (is a part of internal component only, Not to be included in the external examination question paper)	Questions related to the above topics, from various competitive examinations UPSC / TRB / NET/ UGC-CSIR / GATE /TNPSC others to be solved (To be discussed during the Tutorial hours)	
Skills acquired from this course	Knowledge, Problem solving, Analytical ability, Professional Competency, Professional Communication and Transferable skills.	

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Recommended Text	1. Wilson and Gisvold's textbook of organic medicinal and pharmaceutical chemistry. 2. Wilson, Charles Owens: Beale, John Marlowe; Block, John H, Lipincott William, 12th edition, 2011. 3. Graham L. Patrick, An Introduction to Medicinal Chemistry, 5th edition, Oxford University Press, 2013. JayashreeGhosh,AtextbookofPharmaceuticalChemistry,S.ChandandCo.Ltd,1999,1999 edn. 4. O.LeRoy,Natural andsyntheticorganicmedicinal compounds,Ealemi,1976. 5.S.AshutoshKar,MedicinalChemistry, WileyEasternLimited, NewDelhi,1993,New edn.	
Reference Books	1. Foye's Princles of Medicinal Chemistry, Lipincott Williams, Seventh Edition, 2012 2. Burger's Medicinal Chemistry, Drug Discovery and Development, Donald J. Abraham, David P. Rotella, Alfred Burger, Academic press, 2010. 3. WilsonandGisvold'sTextbookofOrganicMedicinalandPharmaceuticalChemistry,John M.BealeJrandJohnM. Block, Wolters Kluwer, 2011,12thedn. 4. P.Parimoo,ATextbookofMedicalChemistry,NewDelhi:CBSPublishers,1995. 5. S.Ramakrishnan, K.G.PrasannanandR.Rajan,TextbookofMedicalBiochemistry,Hyderabad: OrientLongman,3rd edition,2001.	
Website and e-learning source	1. https://www.ncbi.nlm.nih.gov/books/NBK482447/ 2. https://training.seer.cancer.gov/treatment/chemotherapy/types.html 3. https://www.classcentral.com/course/swayam-medicinal-chemistry-12908	

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SCHOOL OF ARTS AND SCIENCE
DEPARTMENT OF CHEMISTRY

VALUE ADDED COURSE
Academic year: 2021-2022
Diploma Course on Water Resources, Management, and Water Pollution & Health

Aim; To provide an idea on Water Resources, Management, and Water

Pollution & Health

Course learning outcomes:

- The participants will learn about the importance of water resources.
- The participants will get insight into the water cycle.
- They will learn and understand the water pollution problem and its gravity.

UNIT -1

- Water cycle and water chemistry
- The water cycle. Properties of water.
- Tetrahedral chemistry of water.
- Physical Physico chemical characteristics water bodies.

UNIT -2

- Water resources and treatment
- Types of ware resources
- National drinking water policy.
- Drinking water treatment plants and various disinfection processes.
- Household treatment, Drinking water standards.

UNIT -3

- Water pollution
- Causes effect and control measures of water pollution.
- Pollution control standards, WHO standards of drinking water.
- Waterborne diseases. Microbial contamination of water types, sources, threats.

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- Microbial standards of drinking water, MPN.

UNIT -4

- Water conservation and water pollution acts in India.
- Water conservation: Ice stupa artificial glacier by Sonam Wangchuk.

UNIT -5

- Rainwater harvesting.
- Watershed Management: Classification, Objective ,Advantages and Disadvantages.

References

1) Water Q&A: Why is water the "universal solvent"?". Water Science School. United States Geological Survey, U.S. Department of the Interior. 20 June 2019. Archived from the original on 6 February 2021. Retrieved 15 January 2021.

2) 10.2: Hybrid Orbitals in Water". Chemistry LibreTexts. 18 March 2020. Archived from the original on 30 July 2022. Retrieved 11 April 2021.

3) Environmental Health Education Program. Cambridge, MA: Harvard T.H. Chan School of Public Health, July 23, 2013. Archived from the original on September 18, 2021. Retrieved September 18, 2021.

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Branch name	Year	Course offered
Chemistry	III BSc	Crystallization and Chromatography Techniques

VALUE ADDED COURSE
Academie year: 2021-2022

Diploma Course on Crystallization and chromatography techniques

Aim:

To introduce students to Crystallization and chromatography techniques.

Objectives:

To inculcate concepts of thin layer and column identification and validation.

To understand techniques in Phenotypic screening and target deconvolution.

To increase the employability of the students.

To educate about then-layer column Chromatographic techniques of novel biologically active compounds.

Course Outcomes

At the end of the course, students will be able to turn
to understand methods of crystallization

Explain the principles and techniques of column and thin-layer chromatographytechniques.

Purify the compounds by crystallization technique.

Analyse and detect the sample thin-lawyer chromatography

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Separate the isomers of a compound by column chromatography technique

Unit – Crystallization

Principle, Methods of recrystallization Melt crystallization, Suspension crystallization; solvents for recrystallization, Precipitation, Nucleation, Supersaturation, Common challenges in crystallization. Processes involved in crystallization, and applications.

Unit-II

Chromatography Techniques

Chromatography – Adsorption, Partition chromatography. Column Chromatography - Principle, Adsorbents, developers, solvents, columns, packing of the columns, elution, eluting solvent selection-polar and non-polar; Applications.

Thin Layer chromatography – Principle, Rf, preparation of chromatophores application of sample on the chromatophores choice of adsorbents, selection of solvent, locating reagents, developing chamber, development of chromatogram and Applications.

Unit-III Practical

Crystallization of simple compounds

Zinc oxide, Copper sulfate, Sodium acetate, Sodium Chloride, Potash alum, Phthalic acid, Benzoic acid, Acetyl salicylic acid, Urea ,and Sugar.

Unit – IV Practical

Thin Layer Chromatography

Separation of Mixture of benzophenone and naphthalene

Separation of Mixture of 2-nitrophenol and 4-nitrophenol

Separation of Mixture of Diphenylamine, Benzophenone and Naphthalene Separation of Mixture of Azobenzene, Hydroxyazobenzene and p-aminoazobenzene

Unit – V Practical

Column Chromatography

Separation of $KMnO_4$ and $K_2Cr_2O_7$ Isolation of
2-nitrophenol and 4-nitrophenol

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VALUE ADDED COURSE

Academic year: 2021-2022

Diploma Course on Molecular Structure Drawing Tool

Aim:

- To introduce students to molecular structure and biological evaluation of novel biologically active compounds.

Objectives:

To inculcate concepts of molecular structure target identification and validation.

To understand techniques in Phenotypic screening and target convolution.

To increase employability of the students.

To educate about role of molecular structure of novel biologically active compounds

Course Outcomes:

At the end of this unit, you will be able to:

- Understand the software used in chemistry
- Perform the Manipulations of Selected Objects
- Apply the chemdraw software to draw the different systems
- Generate the IUPAC and physical properties of organic compounds

Predict resonance spectral data of chemical structures.

UNIT-I: Molecular Structure Drawing Tool

ChemDraw - Introduction, Installation, Drawing molecular structures - structuretypes, drawing the framework of a structure, Drawing Bonds of Different Types Changing Bond Types, Introducing Atom Labels,

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UNIT-II: Manipulations with Selected Objects

Manipulations with Selected Objects- Select Objects, Move Objects, Copy Objects, Rotate and Mirror Objects, Stretch/Shrink/Scale Objects, Structure Perspective, Join Objects.

UNIT-III: ChemDraw-Practical I

Drawi g of molecules - acyclic, cyclic, heterocyclic and bicyclic systems

- Analysis of molecules - formula, exact mass and elemental analysis
- Graphical representation of reaction scheme

UNIT-IV: ChemDraw-Practical II

- Chemical structures to IUPAC names
- IUPAC naming to chemical structures
- 2D structures into 3D structures
- Prediction of boiling point, melting point, critical temperature, critical pressure, criticalvolume and heat of formation.

UNIT-V: ChemDraw-Practical III

Prediction of ^{1}H NMR & ^{13}C NMR of following compounds:

Ethanol, Ethyl methyl ketone, Cycloheptonone, Pyridine and α-napthol

Text Books:

Dr. Stefan Bienz Short Manual to the Chemical Drawing Program ChemDraw University of Zurich I-V

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"Research and Publication Ethics" with 2 credits in the M.Phil.(Chemistry) programme curriculum with effect from 2021-22.

Unit I: PHILOSOPHY AND ETHICS

Introduction to philosophy: definition, nature and scope, concept, branches - Ethics: definition, moral philosophy, nature of moral judgements and reactions.

Unit II: SCIENTIFIC CONDUCT Ethics with respect to science and research - Intellectual honesty and research integrity -Scientific misconducts: Falsification, Fabrication and Plagiarism (FFP) – Redundant Publications: duplicate and overlapping publications, salami slicing - Selective reporting and misrepresentation of data.

Unit III: PUBLICATION ETHICS

Publication ethics: definition, introduction and importance - Best practices / standards setting initiatives and guidelines: COPE, WAME, etc. - Conflicts of interest -. Publication misconduct: definition, concept, problems that lead to unethical behaviour and vice versa, types - Violation of publication ethics, authorship and contributor ship - Identification of publication misconduct, complaints and appeals - Predatory publisher and journals.

Unit IV: OPEN ACCESS PUBLISHING

Open access publications and initiatives - SHERPA/RoMEO online resource to check publisher copyright & self-archiving policies - Software tool to identify predatory publications developed by SPPU - Journal finger / journal suggestion tools viz. JANE, Elsevier Journal Finder, Springer, Journal Suggester, etc.

Unit V: PUBLICATION MISCONDUCT

Group Discussion (a) Subject specific ethical issues, FFP, authorship b) Conflicts of interest c) Complaints and appeals: examples and fraud from India and abroad Software tools: Use of plagiarism software like Turnitin, Urkund and other open source software tools.

Unit VI: DATABASES AND RESEARCH METRICS (7Hrs.)

Databases Indexing databases, Citation databases: Web of Science, Scopus, etc.

Research Metrics : Impact Factor of journal as per Journal Citations Report, SNIP, SJR,

IPP, Cite Score - Metrics: h-index, g index, i10 Index, altmetrics.

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References

1. Nicholas H. Steneck. Introduction to the Responsible Conduct of Research. Office of Research Integrity. 2007. Available at: https://ori.hhs.gov/sites/default/files/rcrintro.pdf

2. The Student's Guide to Research Ethics By Paul Oliver Open University Press, 2003

3. Responsible Conduct of Research By Adil E. Shamoo; David B. Resnik Oxford University Press, 2003

4. Ethics in Science Education, Research and Governance Edited by Kambadur Muralidhar, Amit Ghosh Ashok Kumar Singhvi. Indian National Science Academy, 2019. ISBN : 978-81-939482-1-7.

5. Anderson B.H., Dursaton, and Poole M.: Thesis and assignment writing, Wiley Eastern 1997.

6. Bijorn Gustavii: How to write and illustrate scientific papers? Cambridge University Press.

7. Bordens K.S. and Abbott, B.b.: Research Design and Methods, Mc Graw Hill, 2008.

8. Graziano, A., M., and Raulin, M.,L.: Research Methods – A Process of Inquiry, Sixth Edition, Pearson, 2007.

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Department of Chemistry
PRIST Deemed to be University
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SCHOOLOFARTSAND SCIENCE

DEPARTMENT OF ENGLISH

The meeting of the Board of studies was held on 10-05-2021 at 2.pm through online under the chairmanship of Dr. R.Iniyavan, Head of the department of English.

Agenda:

Curriculum

Feedback

Academic Calendar

Department Activities

Workload

Time table

Others

HOD **DEAN**

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SCHOOLOFARTSAND SCIENCE

DEPARTMENTOFENGLISH

MINUTES OF THE BOARD OF STUDIES MEETING - 2021-2022

The meeting of the Board of studies for UG and PG in English was held on 10-05-2021 at 2.pm through online under the chairmanship of Dr. Iniyavan, Head of the department of English. The following members were present:

S.NO	Name	Designation	Signature
1	Dr.R.Iniyavan	HOD, English- PRIST A&S	
2	Dr.Kannan	Prof , Devanagere University Karnataka	
3	Dr.Dasari Murali Manohar	Prof , University of Hyderabad, Telugana	
4	Dr. N. Meenurajathi	Professor –PRIST A& S	
5	Dr. R.A. Rajasekaran	Professor – PRIST A& S	
6	Dr. N.Prema	Associate Professor-PRIST A& S	
7	Dr.D.Ravikumar	Associate Professor-PRIST A& S	
8	R.Vishalakshi	Assistant Professor- PRIST A& S	
9	Banulakshmi Paladugu	Assistant Professor- PRIST A& S	
10	Dr.L.Chinnappa	DEAN of Arts and Science A& S	
11	V. Esha	Teacher	
12	Magesh V	Student	

The Chairman (BOS) welcomed all the members. Members analyzed the feedbacks from the stake holders and reviewed the existing syllabus for BA, MA, M.Phil in detail. The members of the board have discussed and passed the following resolutions:

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1. Resolved to introduce the following Audit Courses in the B.A.(English) programme curriculum with effect from 2020-21

SemesterI:UniversalHumn Values-2credits

Semester II : Communication Skills- 2 credits

SemesterIII

Officeautomation-2credits

SemesterIV:LeadershipandManagementSkills-2credits

SemesterV:ProfessionalSkills-2credits

Further resolved to approve the syllabus copy for the above mentioned Audit Courses as given in Annexure-I

2. Resolved to introduce the following Audit Courseson SoftSkills in the B.A.(English) programme curriculum with effect from2020-21

YearI:BasicBehavioralEtiquette:2Credits
Year II : General Aptitude and
QuantitativeAbility: 2
CreditsYearIII:InterviewSkillsTrainingand
MockTest:2Credits

Further resolved to approve the syllabus copy for the above mentioned Audit Courses on Soft Skills as given in Annexure-II

3. Resolved to introduce an Audit Course on "Community Engagement" with one credit in the 3rd year of B.A.(English) programme curriculum with effect from2020-21
4. Resolved to drop the courses on Communicative English Laboratories, Skill Based Elective Courses and Course on Extension Activities from the existing curriculum of B.A.(English) programme with effectfrom2020-21.
5. Resolved to modify the contents for the following courses in the II semester of M.A.English programme.

Post-colonial literature
19211AEC22 - Unit IV
DiasporaLiterature

19211AEC23-

Unit IV& V and CanadianLiterature

19211DSC25A- UnitII&IV

6. ResolvedtointroduceaDisciplineSpecificElectiveCoursesinB.A.(English)programme curriculumwitheffect from2020 –2021

SemesterVa)20111DSC55A-SingleAuthor Study-Tagore

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b)20111DSC55B-SingleAuthorStudy-CharlesDickens
c)20111DSC55C-SingleAuthorStudy-KamalaDas
d)20111DSC55D-SingleAuthorStudy-R.K.Narayan
e) 20111DSC55E-SingleAuthorStudy-LeoTolstoy

SemesterVI a)20111DSC64A-Studyofagenre-OneactPlay

b)20111DSC64B-Studyofagenre-Novel
c)20111DSC64C-Studyofagenre-Fiction
d)20111DSC64D-Studyofagenre-Shortstories
e)20111DSC64E-Studyofagenre-Drama

7. Value added courses alike Spoken English and public speaking were introduced to the curriculum, which is the purpose of resolving the student demands in the feedback.

8. Resolved to introduce a Discipline Specific Elective Courses in M.A.(English) programme curriculum with effect from2020 -2021

SemesterI a)20211DSC15A-RomanticMovement

b)20211DSC15B-LiteratureandGender
c)20211DSC15C-IndianLiterature-I
d)20211DSC15D-GothicLiterature
e)20211DSC15E-18thCenturyDrama

SemesterIIa)20211DSC25A-CanadianLiterature

b)20211DSC25B-NewLiterature
c)20211DSC25C-IrishLiterature
d)20211DSC25D-IndianLiterature-II
e)20211DSC25E-19thCenturyDrama

SemesterIIIa)20211DSC34A-AfricanLiterature

b)20211DSC34B-FrenchLiterature
c)20211DSC34C-MedievalLiterature
d)20211DSC34D-ModernismandPostModernism
e)20211DSC34E-20thCenturyDrama

SemesterIVa)20211DSC44A-AustralianLiterature
b)20211DSC44B-EpicsinTranslation
c)20211DSC44C-LinguisticsApproachtoLiterature
d)20211DSC44D-ApproachestoTeachingofLiterature
e)20211DSC44E-AsianAmericanLiterature

9. Resolvedtointroduceacourseon"ResearchandPublicationEthics"with2credit sintheM.Phil (English)programmecurriculumwitheffectfrom2020-21.Further resolve to approve the syllabus forthe same as given in Annexure-IV
Resolved not to make changes in other courses in B.A. English, M.A .English and M.Phil English programmes

10. Resolved not to make changes in Add on course journalism, public speaking.

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Members of the board updated the panel of examiners and submitted the same to the Academic Counsel for its approval

Annexure1-Revised Curriculum Structure Credits

Annexure2-Revised Curriculum structure and Syllabus of UG

Annexure3-Revised Curriculum structure and Syllabus of PG

Annexure 4 - Revised Curriculum structure and syllabus of M.Phil

Annexure 5–Value added courses discussion and enchanting course introduce

Annexure6- List of Examiners

Note: Annexure 1,2,3,4 and 5 are Signed by the Chairman of BOS

Chairman of the board of Studies

Annexure1-RevisedCurriculumStructureCredit

Annexure2 –Revised Curriculum structure and Syllabus of PG

Annexure 3 - Revised Curriculum structure and syllabus of M.Phil

Annexure 4–Value added courses discussion and enchanting course introduce

Annexure 5 - List of Examiners

Note: Annexure 1,2,3,4 and 5 are Signed by the Chairman of BOS

The meeting concluded with the vote of thanks from the Board of Studies, Chairman.

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SCHOOLOFARTSANDSCIENCE
DEPARTMENTOFENGLISH

2020 – 2021

BA ENGLISH- REGULATION 2020
COURSE STRUCTURE
SEMESTER – I

Course Code	Course Title	L	T	P	C
	THEORY				
20110AEC11/ 20111AEC11/ 20132AEC11/ 20135AEC11	Language-I(Tamil-I/ Advanced English-I/ Hindi-I/ French-I)	4	0	0	2
20111AEC12	English-I	4	0	0	2
20111AEC13	Literature in1400-1600Period	5	0	0	3
20111AEC14	Literature in Elizabethan Period	5	0	0	3
20111AEC15	Social History of England-I	4	0	0	3
20111AEC16	History of English Literature-I	5	0	0	4
	Total				**17**
	AUDITCOURSE				
201ACLSICN	Indian Constitution	-	-	-	2
201ACLSUHV	Universal Human Values	-	-	-	2

SEMESTER–II

CourseCode	CourseTitle	L	T	P	C
	THEORY				
20110AEC21/ 20111AEC21/ 20132AEC21/ 20135AEC21	Language-II(Tamil-II/ Advanced English-II/ Hindi-II/ French-II)	4	0	0	2
20111AEC22	English-II	4	0	0	2
20111AEC23	Literature in Jacobean Period	5	0	0	3
20111AEC24	Literature in Restoration Period	5	0	0	4
20111AEC25	Social History of England-II	4	0	0	3
20111AEC26	History of English Literature-II	5	0	0	4
	RESEARCHSKILLBASEDCOURSE				
20111RLC27	Research Led Seminar	-	-	-	1
	Total				19
	AUDITCOURSES				
201ACLSCOS	Communication Skills				2
201ACSSBBE	Basic Behavioral Etiquette				2

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SEMESTER–III

CourseCode	CourseTitle	L	T	P	C
	THEORY				
20110AEC31/ 20111AEC31/ 20132AEC31/ 20135AEC31	Language-III(Tamil-III/ Advanced English-III/ Hindi-III/ French-III)	4	0	0	2
20111AEC32	English-III	4	0	0	2
20111AEC33	Literature in AugustanPeriod	4	0	0	3
20111AEC34	Literature in RomanticPeriod	4	0	0	3
20111SEC35	Literary Forms and Prosody	5	0	0	4
20111AEC36	Shakespeare	4	0	0	3
	RESEARCHSKILLBASEDCOURSE				
20111RMC37	Research Methodology	2	0	0	2
	Total				**19**
	AUDITCOURSE				
201ACLSOAN	Office Automation	-	-	-	**2**

SEMESTER–IV

CourseCode	CourseTitle	L	T	P	C
	THEORY				
20110AEC41/ 20111AEC41/ 20132AEC41/ 20135AEC41	Language-IV(Tamil-IV/ Advanced English-IV/ Hindi-IV/ French-IV)	4	0	0	2
20111AEC42	English-IV	4	0	0	2
20111SEC43	Language and Linguistics	4	0	0	3
20111AEC44	Literature in Victorian Period	4	0	0	3
20111AEC45	Literary Criticism	5	0	0	4
20111AEC46	Indian and European Classics in Translation	4	0	0	3
201ENSTU45	Environmental Studies	2	0	0	2
	Total				**19**
	AUDITCOURSE				
201ACLSLMS	Leadership and Management Skills	-	-	-	**2**
201ACSSAQA	General Aptitude and Quantitative Ability				**2**

SEMESTER–V

CourseCode	Course Title	L	T	P	C
	THEORY				
20111AEC51	Literature in ModernPeriod-I	5	0	0	3
20111AEC52	American Literature	5	0	0	3
20111SEC53	English Language Teaching	5	1	0	5
20111SEC54	Translation	3	1	0	4

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20111DSC55_	Discipline Specific Elective–I	5	0	0	3
	RESEARCHSKILLBASEDCOURSE				
20120BRC57	Participation in Bounded Research	-	-	-	1
	Total				**19**
	AUDITCOURSE				
201ACLSPSL	Professional Skills	-	-	-	2

SEMESTER–VI

CourseCode	CourseTitle	L	T	P	C
	THEORY				
20111AEC61	Literature in Modern Period-II	5	0	0	4
20111AEC62	Indian Writing in English	5	0	0	4
20111AEC63	Common wealth Literature	5	1	0	5
20111DSC64_	Discipline Specific Elective–II	5	0	0	3
201__OEC(2Digit Course Name)	Open Elective	4	0	0	2
	PRACTICAL				
20112PRW66	Project Work	-	-	-	4
20111PEE	ProgrammeExitExamination	-	-	-	1
	Total				**23**
	AUDITCOURSE				
201ACSSIST	InterviewSkillsTrainingandMockTest	-	-	-	2
201ACLSCET	CommunityEngagement	-	-	-	1
	TotalCredits-Programme				**116**
	TotalCredits-AuditCourses				**19**

DisciplineSpecificElectives

Semester	DisciplineSpecificElectiveCourses
V	a) 20111DSC55A-SingleAuthorStudy-Tagore b) 20111DSC55B-Single AuthorStudy-OliverGoldsmith
VI	a) 20111DSC64A-Studyofagenre-Poetry b) 20111DSC64B-Studyofagenre-Novel

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M.A ENGLISH–20PGENGGE-COURSE STRUCTURE

Course Code	CourseTitle	L	T	P	C
	SEMESTERI				
20211AEC11	History of English Language and Structure	6	0	0	4
20211AEC12	Shakespeare	6	0	0	4
20211AEC13	British Literature	6	0	0	4
20211AEC14	Indian Writing in English	6	0	0	4
20211DSC15_	Discipline Specific Elective–I	5	0	0	4
20211RLC16	Research Led seminar	-	-	-	1
	Total	**29**	**0**	**0**	**21**
	SEMESTERII				
20211AEC21	Women's writing in English	5	0	0	4
20211AEC22	Post-Colonial Literature	6	0	0	4
20211AEC23	Diaspora Literature	6	0	0	4
20211AEC24	Comparative Literature & World Classics in Translation	5	0	0	4
20211DSC25_	Discipline Specific Elective– II	5	0	0	4
20211RMC26	Research Methodology	3	0	0	2
20211BRC27	Participation in Bounded Research	-	-	-	2
	Total	**30**	**0**	**0**	**24**
	SEMESTERIII				
20211SEC31	Critical Approaches to English Literature	6	0	0	5
20211AEC32	American Literature	6	1	0	5
20211AEC33	Literary Criticism	6	1	0	5
20211DSC34	Discipline Specific Elective– III	5	0	0	4
202OEC	Open Elective	4	0	0	3
20211SRC36	Design/Socio Technical Research	-	-	-	2
	Total	**27**	**2**	**0**	**24**
	SEMESTERIV				
20211SEC41	Translation	5	1	0	5
20211SEC42	English Language Teaching	6	1	0	5
20211AEC43	English Literature for Competitive Examination	6	0	0	5
20211DSC44_	Discipline Specific Elective– IV	5	0	0	4
20211PRW45	Project Work	0	0	0	6
20211PEE	Programme Exit Examination	0	0	0	2
	Total	**22**	**2**	**0**	**27**
	Total Credits for the Programme				**96**

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Discipline Specific Electives

Semester	Discipline Specific Elective Courses
I	a)20211DSC15A-RomanticMovement b)20211DSC15B-LiteraryMovement
II	a)20211DSC25A-CanadianLiterature b)20211DSC25B-AsianLiteraturesinEnglish
III	a)20211DSC34A- AfricanLiterature b)20211DSC34B- PopularLiterature
IV	a)20211DSC44A- Australian Literature b)20211DSC44B- IndianFictioninTranslation

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M.PhilENGLISHLITERATURE-2020SYLLABUS
M.PhilENGLISHLITERATURE-20MPENGGE

SYLLABUS–REGULATION2020 COURSE STRUCTURE

Course Code	Course Title	L	T	P	C
	Semester I				
203ENC11	Research Methodology and Theory of Literature	2	2	0	2
203ENC12	Literary Theory	2	2	0	2
203ENC13_	Discipline Specific Elective	2	2	0	2
Common Paper	Research and PublicationEthics	2	2	0	2
	Total	**8**	**8**	**0**	**8**
	Semester II				
203END21	Dissertation				2
	Total				
Total					2

Discipline Specific Electives

Semester	Discipline Specific Elective Courses
I	203ENC13A-ModernCriticism
	203ENC13B-CulturalStudies

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VALUE ADDED COURSES

Spoken English

Public speaking

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

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

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Course Code	Course Title	L	T	P	C
201ACLSICN	Indian Constitution	-	-	-	2

Aim

- To understand the salient features of the Indian Constitution

Course Objectives:

- To make the students understand about the democratic rule and parliamentarian administration
- To appreciate the salient features of the Indian constitution
- To know the fundamental rights and constitutional remedies
- 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.

Course outcome:

1. Democratic values and citizenship training are gained
2. Awareness on fundamental rights are established
3. The function of union government and state government are learnt
4. The power and functions of the judiciary are learnt thoroughly
5. Appreaciation of democratic parliamentary rule is learnt

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 an 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, Our parliament ,National book trust , New Delhi 1989

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Course Code	Course Title	L	T	P	C
201ACLSUHV	Universal Human Values	-	-	-	2

Aim:

This course aims at making learners conscious about universal human values in an integralmanner, without ignoring other aspects that are needed for learner's personality development.

Course Objectives :

The present course deals with meaning, purpose and relevance of universal human values and how to inculcate and practice them consciously to be a good human being and realiseone's potentials.

Course Outcomes :

By the end of the course the learners will be able to:

1. Know about universal human values and understand the importance of values in individual, social circles, career path, and national life.
2. Learn from case studies of lives of great and successful people who followed and practised human values and achieved self-actualisation.
3. Become conscious practitioners of human values.
4. Realise their potential as human beings and conduct themselves properly in the ways of the world.

Unit I

- Introduction:What is love? Formsoflove—forself, parents, family, friend, spouse, community, nation, humanity and other beings, both for living and non-living
- Love and compassion and inter-relatedness
- Love, compassion, empathy, sympathy and non-violence
- Individuals who are remembered in history for practicing compassion and love.
- Narratives and anecdotes from history, literature including local folklore
- Practicing love and compassion: What will learners learn gain if they practice love and compassion? What will learners lose if they don't practice love and compassion?
- Sharing learner's individual and/or group experience(s)
- Simulated Situations
- Casestudies

Unit II

- Introduction: What is truth? Universal truth, truth as value, truth as fact (veracity, sincerity, honesty among others)
- Individuals who are remembered in history for practicing thisvalue

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- Narratives and anecdotes from history, literature including localfolklore
- Practicing Truth: What will learners learn/gain if they practice truth? What will learners lose if they don't practiceit?
- Learners' individual and/or group experience(s)
- Simulated situations
- Casestudies

Unit III

- Introduction: What is non-violence? Its need. Love, compassion, empathy sympathy for others as pre-requisites for non-violence
- Ahimsa as non-violence and non-killing
- Individuals and organisations that are known for their commitment to non-violence
- Narratives and anecdotesaboutnon-violence from history,and literature including local folklore
- Practicingnon-violence: What will learners learn/gain if they practice non- violence? What will learners lose if they don't practice it?
- Sharing learner's individual and/or group experience(s) about non-violence
- Simulated situations
- Casestudies

Unit IV

- Introduction: What is righteousness?
- Righteousness and *dharma*, Righteousness and Propriety
- Individuals who are remembered in history for practicing righteousness
- Narratives and anecdotes from history, literature including local folklore
- Practicing righteousness: What will learners learn/gain if they practice righteousness? What will learners lose if they don't practice it?
- Sharing learners' individual and/or group experience(s)
- Simulated situations
- Casestudies

Unit V

- Introduction: What is peace? Its need, relation with harmony and balance
- Individuals and organisations that are known for their commitment to peace
- Narratives and Anecdotes about peace from history, and literature including local folklore
- Practicing peace: What will learners learn/gain if they practice peace? What will learners lose if they don't practice it?
- Sharing learner's individual and/or group experience(s) about peace
- Simulatedsituations

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- Casestudies

Unit VI

- Introduction: What is service? Forms of service for self, parents, family, friend, spouse, community, nation, humanity and other beings—living and non-living, persons in distress ordisaster.
- Individuals who are remembered in history for practicing this value.
- Narratives and anecdotes dealing with instances of service from history, literature including local folklore
- Practicingservice: What will learners learn/gain gain if they practice service? What will learners lose if they don't practice it?
- Sharing learners' individual and/or group experience(s) regarding service
- Simulated situations
- Casestudies

Unit VII

- Introduction: What is renunciation? Renunciation and sacrifice. Self-restrainand

  Ways of overcoming greed. Renunciation with action as true renunciation
- Individuals who are remembered in history for practicing this value.
- Narratives and anecdotes from history and literature,including local folklore about individuals who are remembered for their sacrifice and renunciation.
- Practicing renunciation and sacrifice: What will learners learn/gain if they practice Renunciation and sacrifice? What will learners lose if they don't practiceit?
- Sharing learners' individual and/or group experience(s)
- Simulated situations
- Casestudies

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Course Code	Course Title	L	T	P	C
201ACLSCOS	Communication Skills	-	-	-	2

Aim:

Course Objectives :

This course has been developed with the following objectives:

1. Identify common communication problems that may be holding learnersback
2. Identify what their non-verbal messages are communicating toothers
3. Understand role of communication in teaching-learningprocess
4. Learning to communicate through the digitalmedia
5. Understand the importance of empatheticlistening
6. Explore communication beyondlanguage.

Course Outcome :

By the end of this program participants should have a clear understanding of what good communication skills are and what they can do to improve their abilities.

Unit I

- Techniques of effectivelistening
- Listening andcomprehension
- Probing questions
- Barriers tolistening

Unit II

- Pronunciation
- Enunciation
- Vocabulary
- Fluency
- CommonErrors

Unit III

- Techniques of effectivereading
- Gathering ideas and information from a giventext
  - i. Identify the main claim of thetext
  - ii. Identify the purpose of thetext
  - iii. Identify the context of thetext
  - iv. Identify the conceptsmentioned
- Evaluating these ideas andinformation
  - i. Identify the arguments employed in thetext
  - ii. Identify the theories employed or assumed in thetext
- Interpret thetext
  - i. To understand what a textsays
  - ii. To understand what a textdoes
  - iii. To understand what a textmeans

Unit IV

- Clearly state theclaims
- Avoid ambiguity, vagueness, unwanted generalisations and over simplification of issues
- Provide backgroundinformation
- Effectively argue theclaim
- Provide evidence for theclaims
- Use examples to explainconcepts

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- Followconvention
- Be properlysequenced
- Use proper signpostingtechniques
- Be well structured
  i. Well-knit logicalsequence
  ii. Narrativesequence
  iii. Categorygroupings
- Different modesofWriting
  i. E-mails
  ii. Proposal writing for HigherStudies
  iii. Recording the proceedings ofmeetings
  iv. Any other mode of writing relevant forlearners

Unit V

- Role of Digital literacy in professionallife
- Trends and opportunities in using digital technology inworkplace
- InternetBasics
- Introduction to MS Officetools
  i. Paint
  ii. Office
  iii. Excel
  iv. Powerpoint

Unit VI

- Introduction to social mediawebsites
- Advantages of socialmedia
- Ethics and etiquettes of socialmedia
- How to use Google searchbetter
- Effective ways of using SocialMedia
- Introduction to DigitalMarketing

Unit VII

- Meaning of non-verbalcommunication
- Introduction to modes of non-verbalcommunication
- Breaking the misbeliefs
- Open and Closed Bodylanguage
- Eye Contact and FacialExpression
- HandGestures
- Do's andDon'ts
- Learning fromexperts
- Activities-BasedLearning

Reference:

1. SenMadhucchanda (2010), *An Introduction to Critical Thinking*, Pearson,Delhi
2. Silvia P. J. (2007), *How to Read a Lot*, American Psychological Association, Washington DC

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Course Code	Course Title	L	T	P	C
201ACLSLMS	Leadership and Management Skills	-	-	-	2

Aim:

The aim of the course cultivating and nurturing the innate leadership skills of the youth so that they may transform these challenges into opportunities and become torch bearers of the future by developing creative solutions.

Course Objective:

The Module is designed to:

- Help students to develop essential skills to influence and motivate others
- Inculcate emotional and social intelligence and integrative thinking for effective leadership
- Create and maintain an effective and motivated team to work for the society
- Nurture a creative and entrepreneurial mindset
- Make students understand the personal values and apply ethical principles in professional and social contexts.

Course Outcomes :

Upon completion of the course students will be able to:

1. Examine various leadership models and understand/assess their skills, strengths and abilities that affect their own leadership style and can create their leadership vision
2. Learn and demonstrate a set of practical skills such as time management, self management, handling conflicts, team leadership, etc.
3. Understand the basics of entrepreneurship and develop business plans
4. Apply the design thinking approach for leadership
5. Appreciate the importance of ethics and moral values for making of a balanced personality.

UNIT I- Leadership Skills

a. Understanding Leadership and its Importance

- What is leadership?
- Why Leadership required?
- Whom do you consider as an ideal leader?

Traits and Models of Leadership

- Are leaders born or made?
- Key characteristics of an effective leader
- Leadership styles
- Perspectives of different leaders

Basic Leadership Skills

- Motivation
- Team work
- Negotiation
- Networking

UNIT II - Managerial Skills

a. Basic Managerial Skills

- Planning for effective management
- How to organise teams?
- Recruiting and retaining talent

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- Delegation of tasks
- Learn to coordinate
- Conflict management

Self Management Skills

- Understanding self concept
- Developing self-awareness
- Self-examination
- Self-regulation

UNIT III - Entrepreneurial Skills

a. Basics of Entrepreneurship

- Meaning of entrepreneurship
- Classification and types of entrepreneurship
- Traits and competencies of entrepreneur

Creating Business Plan

- Problem identification and idea generation
- Idea validation
- Pitch making

UNIT IV - Innovative Leadership and Design Thinking

a. Innovative Leadership

- Concept of emotional and social intelligence
- Synthesis of human and artificial intelligence
- Why does culture matter for today's global leaders

Design Thinking

- What is design thinking?
- Key elements of design thinking:
  - Discovery
  - Interpretation
  - Ideation
  - Experimentation
  - Evolution.
- How to transform challenges into opportunities?
- How to develop human-centric solutions for creating social good?

UNIT V- Ethics and Integrity

a. Learning through Biographies

- What makes an individual great?
- Understanding the persona of a leader for deriving holistic inspiration
- Drawing insights for leadership
- How leaders sail through difficult situations?

Ethics and Conduct

- Importance of ethics
- Ethical decision making
- Personal and professional moral codes of conduct
- Creating a harmonious life

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Bibliography and Suggested Readings :

Books

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E-Resources

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- How to Build Your Creative Confidence, Ted Talk by David Kelly - https://www.ted.com/talks/david_kelley_how_to_build_your_creative_confidence
- India's Hidden Hot Beds of Invention Ted Talk by Anil Gupta - https://www.ted.com/talks/anil_gupta_india_s_hidden_hotbeds_of_invention
- Knowledge@Wharton Interviews Former Indian President APJ Abdul Kalam - . "A Leader Should Know How to Manage Failure" https://www.youtube.com/ watch?v=laGZaS4sdeU
- Martin, R. (2007). How Successful Leaders Think. *Harvard Business Review*, *85*(6): 60.
- NPTEL Course on Leadership - https://nptel.ac.in/courses/122105021/9

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Course Code	Course Title	L	T	P	C
201ACLSCET	**Community Engagement**	-	-	-	1

Aim:

Course Objectives:

- To develop an appreciation of rural culture, life-style and wisdom amongst students
- To learn about the status of various agricultural and rural development programmes
- To understand causes for rural distress and poverty and explore solutions for the same
- To apply classroom knowledge of courses to field realities and thereby improve quality of learning

Course Outcomes:

After completing this course, student will be able to

- Gain an understanding of rural life, culture and social realities
- Develop a sense of empathy and bonds of mutuality with local community
- Appreciate significant contributions of local communities to Indian society and economy
- Learn to value the local knowledge and wisdom of the community
- Identify opportunities for contributing to community's socio-economic improvements

UNIT I - Appreciation of Rural Society

Rural life style, rural society, caste and gender relations, rural values with respect to community, nature and resources, elaboration of "soul of India lies in villages" (Gandhi), rural infrastructure.

UNIT II- Understanding rural economy & livelihood

Agriculture, farming, landownership, water management, animal husbandry, non-farm livelihoods and artisans, rural entrepreneurs, rural markets

UNIT III Rural Institutions

Traditional rural organisations, Self-help Groups, Panchayati raj institutions (Gram Sabha, Gram Panchayat, Standing Committees), local civil society, local administration

UNIT IV Rural Development Programmes

History of rural development in India, current national programmes: Sarva Shiksha Abhiyan, Beti Bachao, Beti Padhao, Ayushman Bharat, Swatchh Bharat, PM AwaasYojana, Skill India, Gram Panchayat Decentralised Planning, NRLM, MNREGA, etc.

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NEW COURSES

SINGLE AUTHOR STUDY- CHARLES DICKENS

UNIT-I
Bleak House
Oliver Twist
UNIT- II
Great Expectations
Hard Times
UNIT- III
A Tale of Two Cities
The Pickwick Papers
UNIT – IV
Ghost Stories.
UNIT- V
David Copperfield

SINGLE AUTHOR STUDY- KAMALA DAS

UNIT- I
Summer in Calcutta (1965)
The Old Playhouse

UNIT – II
A Doll for the Child Prostitute
UNIT- III
Padmavati the Harlot"

UNIT – IV
"Memories of Childhood").

UNIT – V
My Story

SINGLE AUTHOR STUDY- R.K.NARAYAN

UNIT – I
The English Teacher"

UNIT – II
Waiting for the Mahatma
A Tiger for Malgudi

UNIT – III
The Guide

UNIT – IV
The Man-Eater of Malgudi

UNIT – V
The Vendor of Sweets

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SINGLE AUTHOR STUDY

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SINGLE AUTHOR STUDY

UNIT – I

Anna Karenina (1877) Team

War and Peace (1869) Team

UNIT - II

The Kreutzer Sonata (1889) Team

UNIT - III

The Death of Ivan Ilyich (1886) Team

UNIT - IV

Sevastopol Sketches (1855) Team

Resurrection (1899) Team

UNIT – V

The Cossacks (1863) Team

A Confession

ONE ACT PLAY

Unit-I

J.M.Synge -Riders to the Sea

John Galsworthy -Defeat

A. A. Milne- The Ugly Duckling

Unit- II

Tennesse Williams- The Frosted Glass Coffin

J. B. Priestley -Mother's Day

Harold Pinter -The Dumb Waiter

Unit III

Eugene Ionesco -The Lesson

George Bernard Shaw -Press Cuttings

Norman McKinnel - The Bishop's Candlesticks

Unit IV

Fritz Karinthy - Refund

Eugene O' Neil- Thirst

Alice Gerstenberg - He Said and She Said

Unit -V

Anton Chekhov -The Marriage Proposal

W.W.Jacobs -The Monkey's Paw

Arthur Miller - A Memory of Two Mondays

STUDY OF A GENRE-FICTION

The Great Gatsby- F. Scott Fitzgerald

Pride and Prejudice- Jane Austen'

UNIT – II

Wuthering Heights- Emily Bronte

Beloved - Toni Morrison

UNIT –III

The Lord of the Rings - JRR Tolkien.

Jane Eyre- Charlotte Brontë

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UNIT – IV
The Color Purple – Alice Walker.
UNIT – V
The Grapes of Wrath- John Steinbeck

STUDY OF A GENRE-SHORT STORY

Unit I
The Gift of the Magi - O. Henry
The Necklace - Guy de Maupassant
Christmas Every Day - William Dean Howells
An Angel in Disguise - by T.S. Arthur
Unit II
A Tiger in the House - Ruskin Bond
Karma - Kushwant Singh

An Astrologer's Day - R.K.Narayan
. Kabuliwala - Rabindranath Tagore
Unit III
The Storyteller - by H. H. Munro (Saki)
Clay - James Joyce
The Model Millionaire - Oscar Wilde
A Ghost Story - Mark Twain
Unit IV
A Simple Question - Temsula Ao
One of These Days - Gabriel Garcia Marquez
The Enemy - Pearl S. Buck
Shooting an Elephant - George Orwell
Unit V
The Thief - Fyodor Dostoevsky
Sherlock Holmes: A Case of Identity - Sir Arthur Conan Doyle
A Haunted House - Virginia Woolf
The Doll's House - Katherine Mansfield Self-Study

STUDY OF A GENERE- DRAMA

UNIT- I- Introduction to Drama
- Definition and characteristics of drama
- Historical development of drama (Greek tragedy, Renaissance theatre, modern drama)
- Key terms: plot, character, dialogue, setting, theme, conflict, resolution

UNIT II. Elements of Drama

- Plot: structure, exposition, rising action, climax, falling action, resolution
- Character: protagonist, antagonist, character development, characterization techniques
- Dialogue: functions, types (monologue, dialogue, aside), dramatic irony
- Setting: time, place, atmosphere, significance
- Theme: definition, identification, analysis

UNIT -III. Types of Drama

- Tragedy: characteristics, examples (Greek tragedy, Shakespearean tragedy)

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- Comedy: characteristics, examples (farce, satire, romantic comedy)
- Melodrama: characteristics, examples
- Realistic Drama: characteristics, examples

UNIT-V. Dramatic Structure

- Exposition: introduction to setting, characters, situation
- Rising Action: build-up of tension, conflict, suspense
- Climax: turning point, moment of greatest tension
- Falling Action: resolution, aftermath
- Resolution: conclusion, denouement

UNIT-V. Dramatic Techniques

- Imagery*: visual, auditory, sensory details
- *Symbolism*: objects, colors, settings with symbolic meaning
- *Irony*: verbal, situational, dramatic irony
- *Foreshadowing*: hints at future events

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NEW COURSES –P.G

LITERATURE AND GENDER

UNIT –I

Introduction to Gender Studies in Literature and 'The Chess Players' by Munshi Premchand

UNIT –II

The Chess Players' and 'Shooting an Elephant' by George Orwell

UNIT –III

Heart of Darkness by Joseph Conrad

UNIT –III

The Fly' by Katherine Mansfield

UNIT –V

Look Back in Anger by John Osborne

INDIAN LITERATURE - I

UNIT – I

Indian Classical Literature

UNIT –II

Indian Comparative Literature

UNIT –III

The Princes - Manohar Malgaonkar,

A Fine Balance - Rohinton Mistry,

UNIT- IV

Untouchable - Mulk Raj Anand,

Kanthapura - Raja Rao,

UNIT – V

Day -Anita Desai

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GOTHIC LITERATURE

Unit 1: GOTHICA: When Gruesome is Delicious

Unit 2: FRANKENSTEIN: A Monster is Born

Unit 3: FRANKENSTEIN: With Great Power Comes Great Responsibility

Unit 4: JEKYLL & HYDE: To Thine Ownself Be True

Unit 5: GOTHIC POETRY: Love From Beyond the Grave

18TH CENTURY DRAMA

UNIT- I

The Wonder- Susanna Centlivre set in Lisbon

UNIT- II

The Clandestine Marriage - David Garrick

UNIT-III

The Widow Ranter- Aphra Behn'

UNIT-IV

The Way of the World- William Congreve

UNIT- V

The Fair Penitent- Nicholas Rowe

NEW LITERATURE

UNIT- I

Introduction to New Literatures in English- Sri Lankan-Carribean-Australian-Latin AmericanCanadian-Japanese-Chinese-New Zealand-African.

Unit 2

Poetry

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Derek Walcott "Ruined House"
Dom Moraes "Sinbad"
Jorge Luis Borges "A Compass"
Margaret Atwood "Journey to the Interior"

Unit 3

Fiction [Non-Detailed]

Jose Saramago "*Blindness*".
Romesh Gunasekera "*Reef*".
Chinua Achebe "*Things Fall Apart*".

Unit 4

Drama

Yukio Mishima "*The Damask Drum*"
Jack Davis "*No Sugar*"

Unit 5

Short Fiction [Non-Detailed]

Gao Xingjian "The Temple".
Katherine Mansfield "A Suburban Fairytale".

Objective

IRISH LITERATURE

UNIT-I

Oscar Wilde- The Importance Of Being Earnest

UNIT-II

James Joyce – The Portrait Of The Artist As A Young Man

UNIT-III

Samuel Beckett- Waiting For Godot

UNIT-IV

Seamus Heaney- Bog Queen

UNIT-V

The Cambridge companion to modern Irish culture –Joe Cleary

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INDIAN LITERATURE –II

UNIT-1: Poetry

Is Poetry always worthy when it's old?" -Kalidasa (Malavikagnimitra)

What He Said " - -Ilankiranar Narrinai 3 (57)

Gitanjali – (34,35,36) - Rabindranath Tagore

UNIT-2: Prose

"A Popular Literature for Bengal" -Bankim Chandra Chatterjee from The Picador Book of Modern Indian Literature Amit Chaudhuri

.Gandhiji as a SchoolMaster" - Mahatma Gandhi from The Story of My Experiments with Truth

. "What is Dalit Literature?" - Sharathchanra Mukthibodh (Selection from Poisoned Bread –Arjun Dangle)

UNIT-3 Drama 3.1 Tughlaq - Girish Karnad

UNIT 4. Short Story

"Roots" - Ismat Chugtai (Urdu)

"The Shroud" -Munshi Premchand (Hindi)

"Toba Tek Singh" - Sadat Hasan Manto (Urdu)

UNIT-5: Fiction

Chemeen Thakazhi Siva Shankara Pillai

19TH CENTURY

Unit- I

Uncle Tom's Cabin: A melodrama by George L. Aiken

Unit-II

Under the Gaslight: A melodrama by Augustin Daly

Unit-III

Madame Butterfly: A melodrama by David Belasco

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UNIT-IV

The Girl of the Golden West: A melodrama by David Belasco

UNIT-V

The Octoroon: A melodrama by Dion Boucicault

FRENCH LITERATURE

Unit- I

Introduction To French Literature

Unit- II

Classical French Literature

Enlightment And 1th Century Literature

Unit-III

French Romanticism

Unit- IV

Realism and Naturalism

Unit- V

Symbolism and Modernism

MEDIEVAL LITERATURE

UNIT-I

The not-so-'dark' age Already rewriting history: Gildas

UNIT-II

Old Celtic literature Old Welsh: 'Y Gododdin' (pp. 9-15), Middle Welsh: 'Caru Merch Fonheddig – Wooing a Noble Girl' by Dafydd ap Gwilym (14th c.; handout) compare to 'The Flea' by John Donne publ. 1633 (handout) Old Irish: 'Messe ocus Pangur Bán' (poet's selfie with cat) (pp.

UNIT-III

Literature as Propaganda 'The Battle of Maldon'

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Saint's Lives: 'The Passing of Mary of Egypt' (on line) 23 Sermons: Wulfstan the Homilist's 'Sermo Lupi ad Anglos

UNIT- IV

Middle English Lyrics: Geoffrey Chaucer 'Parliament of Fowles'

UNIT-V

The Medieval 'Startrek': Term paper due; extract from Robert Manning of Brunne, Handlyng Synne

MODERNISM AND POSTMODERNISM

UNIT-I

Fitzgerald- The Great Gatsby

UNIT-II

Ellison- Invisible Man

UNIT-III

Auster-City of Glass

UNIT-IV

Jackson Patchwork Girl

UNIT-V

Coover -The End of Books

Landow -Reconfiguring Narrative

20TH CENTURY DRAMA

UNIT-I

Historical, political, and social context: The course might examine the historical and political context of the time, and how it influenced the literature.

UNIT- II

Literary movements, Themes and style

UNIT- III

Absurdist drama:The Bald Soprano, Rhinoceros

UNIT- IV

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New drama: Long Day's Journey into Night- Eugene O'Neill

A Streetcar Named Desire- Tennessee Williams

UNIT- V

Techniques used by the major writers of the period

EPICS IN TRANSLATION

UNIT- I

Thirukkural – Athigaram 123

UNIT-II

Kamparamayanam- sundrankandam

UNIT- III

Mhabaratham- Krishna Upathesam

UNIT-IV

Sivagasinthamani – Kunamalayar Innampagam

UNIT – V

Silappathigaram - Nadu Kan kathai

LINGUISTICS APPROACH TO LITERATURE

UNIT- I

The Art of Sympathy in Fiction

UNIT- II

Author Representations in Literary Reading.

UNIT –III

Cognitive Grammar in Literature.

UNIT- IV

Cognitive Grammar in Contemporary Fiction

UNIT- V

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AUSTRALIAN LITERATURE

UNIT- I

Australian Literature. -Australia-Land and History
People and Culture.

UNIT- II

Literary Beginnings-Oral Literature, Early Literature.

UNIT- III

Themes and Trends

UNIT- IV

Peter Carey- True History of the Kelly Gang

UNIT- V

Dorothy Porter- The Monkey's Mask

ASIAN AMERICAN LITERATURE

UNIT- I

Frank Chin- The Chickencoop Chinaman

UNIT- II

Maxine Hong Kingston- The Woman Warrior

UNIT- III

Chang-Rae Lee- Native Speaker

UNIT-IV

John Okada- No-No Boy

UNIT-V

Rajesh Parameswara -, I am an Executioner: Love Stories

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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 21.04.2021 at 11.30 am in the ICT Room at PRIST University, Vallam Campus under the Chairmanship of Prof. Dr.R.Latha (**https://meet.google.com/qrb-jyxx-hmq**)

The following Members attended the meeting:

S.No.	Name of the Member	Position	Role
1.	Dr.R.Latha	HOD/CSE	Chair Person
2.	Dr.Sahayya Arul Mary	HOD, Dept of CSE, Saranathan College of Engineering, Tiruchirappalli	External Member
3.	Mr.Prasanna Venkatesh	Senior Data Analyst, STAPLES Inc, USA	External Member
4.	Dr.S.Nithyanandam	Professor	Internal Member
5.	Dr.L.S. Usharani	Professor	Internal Member
6.	Dr.K.Padmapriya	Associate Professor	Internal Member
7.	Dr.A.N.Arularasan	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	S.Ajaykumar	HCL,Chennai	Internal Member
12	S.Balakumar	IV Year student	Internal Member

The Chairman, Board of Studies in the Department Computer science and Engineering welcomed the members and briefed about the existing curriculum and syllabi for various programmes offered by the Department and also the details of feedback on curriculum received from the various stakeholders during the Academic year 2020-21

After thorough scrutiny of the curriculum and Syllabi and the details of feedback on curriculum received from the Stakeholders during the Year 2020-21, the members of the Board have unanimously passed the following resolutions:

- Resolved to introduce few new courses in the curriculum with effect from AY 2021 – 22. The List of New courses introduced and changes in existing courses are attached in the ANNEXURES – I and ANNEXURES – II respectively.

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- To introduce new 5 value added courses

ETHICAL HACKING

BLOCK CHAIN

ROBOTICS AND AUTOMATION

DIGITAL MARKETING

DATA SCIENCE

The member of the board scrutinized the feedback of stakeholder the following programmes and resolved to revise the curriculum academic year 2021-2022 for the following programming and recommend to the Academic programming B.Tech –CSE-Fulltime.

S.No.	Name of the Member	SIGNATURE
1.	Dr.R.Latha	
2.	Dr.Sahayya Arul Mary	
3.	Mr.Prasanna Venkatesh	
4.	Dr.S.Nithyanandam	
5.	Dr.L.S. Usharani	AB
6.	Dr.K.Padmapriya	AB
7.	Dr.A.N.Arularasan	
8.	S.Jancy Sickory Daisy	
9.	K.Jayanthi	
10.	Prof.R.Tamizhselvan	
11	S.Ajaykumar	
12	S.Balakumar	

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SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF

COMPUTER SCIENCE AND ENGINEERING

PROGRAM HANDBOOK

B.TECH – FULL TIME

[REGULATION 2021]

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I - VIII SEMESTERS CURRICULUM

SEMESTER I

Sl. No.	COURSE CODE	COURSE TITLE	L	T	P	C
THEORY						
1.	21147IP	Induction Programme	2 Weeks			
2.	21147S11	Professional English - I	3	0	0	3
3.	21148S12	Matrices and Calculus	3	1	0	4
4.	21149S13	Engineering Physics	3	0	0	3
5.	21149S14	Engineering Chemistry	3	0	0	3
6.	21150S15	Problem Solving and Python Programming	3	0	0	3
PRACTICALS						
7.	21150L16	Problem Solving and Python Programming Laboratory	0	0	4	2
8.	21149L17	Physics and Chemistry Laboratory	0	0	4	2
9.	21147L18	Communication Laboratory – I	0	0	2	1
		TOTAL	15	1	10	**21**

SEMESTER II

Sl. No.	COURSE CODE	COURSE TITLE	L	T	P	C
THEORY						
1.	21147S21	Professional English – II	3	0	0	3
2.	21148S22	Statistics and Numerical Methods	3	1	0	4
3.	21149S23A	Physics for Information Science	3	0	0	3
4.	21154S24	Engineering Graphics	2	0	4	4
5.	21153S25A	Basic Electrical and Electronics Engineering	3	0	0	3
6.	21150C26	Programming in C	3	0	0	3
PRACTICALS						
7.	21154L21	Engineering Practices Laboratory	0	0	4	2
8.	21150L22	Programming in C Laboratory	0	0	4	2
9.	21147L23	Communication Laboratory – II	0	0	4	2
		TOTAL	17	1	16	**26**

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SEMESTER III

Sl. No	COURSE CODE	COURSE TITLE	L	T	P	C
		THEORY				
1.	21148S31A	Discrete Mathematics	3	1	0	4
Sl. No	**COURSE CODE**	**COURSE TITLE**	**L**	**T**	**P**	**C**
2.	21150C32	*Digital Principles and Computer Organization	3	0	2	4
3.	21150C33	Data Structures	3	0	0	3
4.	21150C34	Object Oriented Programming	3	0	0	3
5.	21150C35	Foundations of Data Science	3	0	0	3
		PRACTICALS				
6.	21150L36	Data Structures Laboratory	0	0	4	2
7.	21150L37	Object Oriented Programming Laboratory	0	0	4	2
8.	21150L38	Data Science Laboratory	0	0	4	2
9.	21150L39	Professional Development	0	0	2	1
		TOTAL	15	1	16	24

SEMESTER IV

Sl. No	COURSE CODE	COURSE TITLE	L	T	P	C
		THEORY				
1.	21150C41	Theory of Computation	3	0	0	3
2.	21150C42	*Artificial Intelligence and Machine Learning	3	0	2	4
3.	21150C43	Database Management Systems	3	0	0	3
4.	21150C44	*Algorithms	3	0	2	4
5.	21150C45	Introduction to Operating Systems	3	0	0	3
6.	21149S46	Environmental Sciences and Sustainability	3	0	0	3
		PRACTICALS				
7.	21150L47	Database Management Systems Laboratory	0	0	4	2
8.	21150L48	Operating Systems Laboratory	0	0	4	2
		TOTAL	18	0	12	24

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SEMESTER V

Sl. No	COURSE CODE	COURSE TITLE	L	T	P	C
THEORY						
1.	21150C51	*Compiler Design	3	0	2	4
2.	21150C52	*Computer Networks	3	0	2	4
3.	21150C53	Cryptography and Cyber Security	3	0	0	3
4.	21150C54	Distributed Computing	3	0	0	3
5.	21150E55_	*Elective I	3	0	2	3
6.	21150E56_	Elective II	3	0	0	3
7.	21147MC51_	Mandatory Course - I	3	0	0	0
PRACTICALS						
		TOTAL	21	0	6	**20**

SEMESTER VI

Sl. No	COURSE CODE	COURSE TITLE	L	T	P	C
THEORY						
1.	211__OE61	Open Elective - I	3	0	0	3
2.	21152S62	*Embedded Systems and IOT Design	3	0	2	4
3.	21150C63	*Object Oriented SoftwareEngineering	3	0	2	4
4.	21150E64_	*Elective - III	3	0	2	3
5.	21150E65_	*Elective - IV	3	0	2	3
6.	21150E66_	*Elective - V	3	0	2	3
7.	21150E67_	*Elective -VI	3	0	2	3
8.	21147MC61_	Mandatory Course - II	3	0	0	0
		TOTAL	24	0	12	**23**

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Sl. No	COURSE CODE	COURSE TITLE	L	T	P	C
THEORY						
1.	21147S71	Human Values and Ethics	2	0	0	2
2.	211_ _OE72	Open Elective – II	3	0	0	3
3.	211_ _OE73	Open Elective – III	3	0	0	3
4.	211_ _OE74	Open Elective – IV	3	0	0	3
5.	21160E75_	Elective – VII	3	0	0	3
PRACTICALS						
6.	21150INT76	Summer Internship	0	0	0	2
		TOTAL	14	0	0	16

SEMESTER VIII

Sl. No	COURSE CODE	COURSE TITLE	L	T	P	C
PRACTICALS						
1.	21150C81	Project Work	0	0	20	10
		TOTAL	0	0	20	10
		TOTAL NO. OF CREDITS:				164

PROFESSIONAL ELECTIVE COURSES

SEMESTER V

ELECTIVE - I

Sl. No	COURSE CODE	COURSE TITLE	L	T	P	C
1.	21150E55A	Exploratory Data Analysis	3	0	2	3
2.	21150E55B	Recommender Systems	3	0	2	3
3.	21150E55C	Neural Networks and Deep Learning	3	0	2	3
4.	21150E55D	Text and Speech Analysis	3	0	2	3
5.	21150E55E	* Business Analytics	3	0	2	3
6.	21150E55F	Image and video analytics	3	0	2	3
7.	21150E55G	Computer Vision	3	0	2	3
8.	21150E55H	Big Data Analytics	3	0	2	3

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ELECTIVE - II

Sl. No	COURSE CODE	COURSE TITLE	L	T	P	C
1.	21150E56A	Web Technologies	3	0	2	3
2.	21150E56B	App Development	3	0	2	3
3.	21150E56C	Cloud Services Management	3	0	2	3
4.	21150E56D	UI and UX Design	3	0	2	3
5.	21150E56E	Software Testing and Automation	3	0	2	3
6.	21150E56F	Web Application Security	3	0	2	3
7.	21150E56G	Dev-ops	3	0	2	3
8.	21150E56H	Principles of Programming Languages	3	0	0	3

SEMESTER VI

ELECTIVE - III

Sl. No	COURSE CODE	COURSE TITLE	L	T	P	C
1.	21150E64A	Cloud Computing	3	0	2	3
2.	21150E64B	Virtualization	3	0	2	3
3.	21150E64C	Cloud Services Management	3	0	2	3
4.	21150E64D	Data Warehousing	3	0	2	3
5.	21150E64E	Storage Technologies	3	0	2	3
6.	21150E64F	Software Defined Networks	3	0	2	3
7.	21150E64G	Stream Processing	3	0	2	3
8.	21150E64H	Security and Privacy in Cloud	3	0	2	3

ELECTIVE - IV

Sl. No	COURSE CODE	COURSE TITLE	L	T	P	C
1.	21150E65A	Ethical Hacking	3	0	2	3
2.	21150E65B	Digital and Mobile Forensics	3	0	2	3
3.	21150E65C	Social Network Security	3	0	2	3
4.	21150E65D	Modern Cryptography	3	0	2	3

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5.	21150E65E	Engineering Secure Software Systems	3	0	2	3
6.	21150E65F	Crypto currency and Block chain Technologies	3	0	2	3
7.	21150E65G	Network Security	3	0	2	3
8.	21150E65H	Security and Privacy in Cloud	3	0	2	3

SEMESTER VI

ELECTIVE - V

Sl. No	COURSE CODE	COURSE TITLE	L	T	P	C
1.	21150E66A	Augmented Reality/Virtual Reality	3	0	2	3
2.	21150E66B	Multimedia and Animation	3	0	2	3
3.	21150E66C	Video Creation and Editing	3	0	2	3
4.	21150E66D	UI and UX Design	3	0	2	3
5.	21150E66E	Digital marketing	3	0	2	3
6.	21150E66F	Visual Effects	3	0	2	3
7.	21150E66G	Game Development	3	0	2	3
8.	21150E66H	Multimedia Data Compression and Storage	3	0	2	3

SEMESTER VI

ELECTIVE - VI

Sl. No	COURSE CODE	COURSE TITLE	L	T	P	C
1.	21150E67A	Augmented Reality/Virtual Reality	3	0	2	3
2.	21150E67B	Robotic Process Automation	3	0	2	3
3.	21150E67C	Neural Networks and Deep Learning	3	0	2	3
4.	21150E67D	Cyber security	3	0	2	3
5.	21150E67E	Quantum Computing	3	0	2	3
6.	21150E67F	Crypto currency and Block chain Technologies	3	0	2	3
7.	21150E67G	Game Development	3	0	2	3
8.	21150E67H	3D Printing and Design	3	0	2	3

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SEMESTER VII

ELECTIVE - VII

Sl. No	COURSE CODE	COURSE TITLE	L	T	P	C
1.	21160E75A	Principles of Management	3	0	0	3
2.	21160E75B	Total Quality Management	3	0	0	3
3.	21160E75C	Industrial Management	3	0	0	3

LIST OF OPEN ELECTIVES

SEMESTER VI

OPEN ELECTIVE-I

Sl. No	DEPT	COURSE CODE	COURSE TITLE	L	T	P	C
1.	Civil	21155OE61	Climate Change and its Impact	3	0	0	3
2.	EEE	21153OE61	Renewable Energy System	3	0	0	3
3.	Mech	21154OE61	Introduction to Industrial Engineering	3	0	0	3
4	CSE	21150OE61	Graph Theory	3	0	0	3
5.	ECE	21152OE61	Deep Learning	3	0	0	3

SEMESTER VII

OPEN ELECTIVE-II

Sl. No	DEPT	COURSE CODE	COURSE TITLE	L	T	P	C
1.	Civil	21155OE72	ICT in Agriculture	3	0	0	3
2.	EEE	21153OE72	Introduction to Control Engineering	3	0	0	3
3.	Mech	21154OE72	Aviation Management	3	0	0	3

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4.	CSE	21150OE72	Dev-Ops	3	0	0	3
5.	ECE	21152OE72	Robotics Process Automation	3	0	0	3

OPEN ELECTIVE-III

Sl. No	COURSE CODE	COURSE TITLE	L	T	P	C
1	21147OE73A	English for Competitive Examinations	3	0	0	3
2	21153OE73A	Renewable EnergyTechnologies(EEE)	3	0	0	3
3	21153OE73B	Electric and Hybrid Vehicle(EEE)	3	0	0	3
4	21154OE73A	Introduction to non-destructive testing (MECHANICALENGINEERING)	3	0	0	3
5	21154OE73B	Industrial Management	3	0	0	3
6	21152OE73A	Biomedical Instrumentation (ECE)	3	0	0	3
7	21152OE73B	Fundamentals of Electronic Devices and Circuits(ECE)	3	0	0	3

OPEN ELECTIVE-IV

Sl. No	COURSE CODE	COURSE TITLE	L	T	P	C
1	21154OE74A	Additive Manufacturing (MECHANICAL ENGINEERING)	3	0	0	3
2	21154OE74B	Industrial safety (MECHANICAL ENGINEERING)	3	0	0	3
3	21153OE74A	Sensors (EEE)	3	0	0	3

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4	21153OE74B	Electrical, Electronic and Magnetic materials (EEE)	3	0	0	3
5	21152OE74A	Wearable devices (ECE)	3	0	0	3
6	21152OE74B	Medical Informatics(ECE)	3	0	0	3

LIST OF MANDATORY COURSES

SEMESTER V
MANDATORY COURSE – I

Sl. No	COURSE CODE	COURSE TITLE	L	T	P	C
1.	21147MC51A	Introduction to Women and Gender Studies	3	0	0	3
2.	21147MC51B	Elements of Literature	3	0	0	3
3.	21147MC51C	Film Appreciation	3	0	0	3
4.	21147MC51D	Disaster Risk Reduction and Management	3	0	0	3

SEMESTER VI

MANDATORY COURSE – II

Sl. No	COURSE CODE	COURSE TITLE	L	T	P	C
1.	21147MC61A	Well Being with Traditional Practices (Yoga, Ayurveda and Siddha)	3	0	0	3
2.	21147MC61B	History of Science and Technology in India	3	0	0	3
3.	21147MC61C	Political and Economic Thought for a Humane Society	3	0	0	3
4.	21147MC61D	State, Nation Building and Politics in India	3	0	0	3
5.	21147MC61E	Industrial Safety	3	0	0	3

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CREDITS DISTRIBUTION
CGPA CREDITS

Sem.	Core Courses				Elective Courses				Foundation Courses		Mandatory Courses		TOTAL CGPA Credits
	Theory Courses		Practical Courses		Dept. Elective		Open Elective						
	Nos.	Credits	Nos.	Credits	Nos.	Credits	Nos.	Credits	Nos.	Credits	Nos.	Credits	
I	01	3	03	5	-	-	-	-	04	13	-	-	21
II	02	7	03	6	-	-	-	-	04	14	-	-	27
III	05	17	03	5	-	-	-	-	01	4	-	-	26
IV	05	17	02	4	-	-	-	-	01	3	-	-	24
V	03	10	01	2	03	9	-	-	-	-	1	0	21
VI	02	8	-	-	03	9	01	3	-	-	1	0	20
VII	-	-	01	2	01	3	03	9	01	2	-	-	16
VIII	-	-	01	10	-	-	-	-	-	-	-	-	10
TOTAL CREDITS													165

NON CGPA CREDITS

Sem.	Non- CGPA Credits	
	No of Courses	Credits
I	01	00
II	-	-
III	-	-
IV	-	-
V	01	00
VI	01	00
VII	-	-
VIII	-	-
Total	**03**	**00**

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Value added courses

225150EH- ETHICAL HACKING

UNIT I INTRODUCTION TO HACKING

Introduction to Hacking – Important Terminologies – Penetration Test – Vulnerability Assessments versus Penetration Test – Pre-Engagement – Rules of Engagement -Penetration Testing Methodologies – OSSTMM – NIST – OWASP – Categories of Penetration Test – Types of Penetration Tests – Vulnerability Assessment Summary –Reports .

UNIT II FOOT PRINTING AND RECONNAISSANCE

Scanning Networks – Enumeration - Vulnerability Analysis - System Hacking - Malware Threats – Sniffing.

Unit–III-NETWORKATTACKS

Vulnerability Data Resources – Exploit Databases – Network Sniffing – Types of Sniffing - Promiscuous versus Non promiscuous Mode – MITM Attacks – ARP Attacks – Denial of Service Attacks -Hijacking Session with MITM Attack – SSL Strip: Stripping HTTPS Traffic -DNS Spoofing – ARP Spoofing Attack Manipulating the DNS Records – DHCP Spoofing -

Unit IV TYPES OF HACKERS

Black Hat Hacker - White Hat Hacker - Grey Hat Hacker - **Hacking Process -** Foot Printing – Scanning - Gaining Access - Maintaining Access

Unit V WIRELESS AND WEB HACKING

Wireless Hacking – Introducing Aircrack- Cracking the WEP – Cracking a WPA/WPA2 Wireless Network Using Aircrack-ng – Evil Twin Attack – Causing Denial of Service on the Original AP – Web Hacking – Attacking the Authentication – Brute Force and Dictionary Attacks – Types of Authentication – Log-In Protection Mechanisms – Captcha Validation Flaw .

Duration:45Hours

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DEPARTMENT OF COMPUTER SCIENCE ANDENGINEERING

Value added courses

225150BC-BLOCK CHAIN

UNIT I INTRODUCTION TO BLOCKCHAIN

History of Blockchain – Types of Blockchain – Consensus – Decentralization using Blockchain – Blockchain and Full Ecosystem Decentralization – Platforms for Decentralization.

UNIT II BITCOIN BASICS

Bitcoin blockchain, Challenges and solutions, proof of work, Proof of stake, alternatives to Bitcoin consensus, Bitcoin scripting language and their use.

UNIT III ETHEREUM

The Ethereum Network – Components of Ethereum Ecosystem – Ethereum Programming Languages: Runtime Byte Code, Blocks and Blockchain, Fee Schedule – Supporting Protocols – Solidity Language.

UNIT IV PRIVACY, SECURITY ISSUES IN BLOCKCHAIN

Pseudo-anonymity vs. anonymity, Zcash and Zk-SNARKS for anonymity preservation, attacks on Blockchains: Sybil attacks, selfish mining, 51% attacks advent of algorand; Sharding based consensus algorithms to prevent these attacks.

UNIT V ALTERNATIVE BLOCKCHAINS AND NEXT EMERGING TRENDS

Kadena – Ripple – Rootstock – Quorum – Tendermint – Scalability – Privacy – Other Challenges – Blockchain Research – Notable Projects – Miscellaneous Tools.

Duration:45Hours

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DEPARTMENT OF COMPUTER SCIENCE ANDENGINEERING

Value added courses

225150RAA- ROBOTICS AND AUTOMATION

UNIT I OVERVIEW OF ROBOTICS

Introduction to Robotics - History - Definitions - Law of Robotics — Terminologies - Classifications Overview — Links & Joints - Degrees of Freedoms - Coordinate Systems - Work Volume - Precision, Repeatability & Accuracy - Position and Orientation of Objects - Roll, Pitch and Yaw Angles - Joint Configuration of Five Types of Serial Manipulators - Wrist Configuration- Overview of end effector - Selection and Application of Serial Manipulators.

UNIT II FORWARD KINEMATICS - GEOMETRICAL AND ALGEBRAIC APPROACH

Need for forward and Inverse Kinematics Equation – Parameters in Design and Control – Methods of forward and inverse kinematics- Geometrical and Algebraic Approach in Forward Kinematics Solution, 1 DOF - 2 DOF Planar Robot (2P and 2R); 3DOF 2RP Spatial Robot.

UNIT III FORWARD KINEMATIC MODELING – DENAVIT- HARTEBERG (DH) APPROACH

Unit Circle Trigonometry - Translation Matrix - Rotation matrix, Euler Angles
- Quaternion Fundamental - Dot and Cross Products - Frames and Joint Coordinates - Homogeneous Transformation - D-H and Modified D-H Convention and Procedures — Forward kinematics Solution using D-H Convention: 3 DOF wrist , RR Planar, 3 DOF RRP, Cartesian, Cylindrical, Spherical , SCARA and Articulated 3 DOF robots - 3 DOF robot with wrist.

UNIT IV INVERSE KINEMATICSMODELING

Introduction to inverse kinematics -Issues in inverse kinematics - Inverse kinematics of 2 DOF Planar robot - 2 and 3DOF planar and Spatial robot - Tool configuration - Inverse kinematics of 3 axis robot and 6 axis Robot - Inverse kinematics Computation- Closed loop solution

UNIT V KINEMATIC MODELING OF DIFFERENTIAL DRIVE ROBOT

Degree of Mobility, Steerability and Maneuverability- Mobile Robot kinematics- Kinematic model and constraints, Mobile robot workspace – Representation of robot position – Kinematic models of differential wheel drive - Fixed wheel and steered wheel - Mobile manipulators and its applications
– swarm robots.

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DEPARTMENT OF COMPUTER SCIENCE ANDENGINEERING

Value added courses

225150DM- DIGITAL MARKETING

UNIT I- INTRODUCTION TO IOT

What is Digital Marketing- Need of Digital Marketing-Digital Marketing Platforms – Understanding digital marketing process- Difference between Traditional Marketing and digital Marketing- tools of Digital marketing - Advantage of Digital Marketing-Digital Marketing Manager Role and functions - How we use both Digital & Traditional Marketing

UNIT II-WEBSITE & SEARCH ENGINE

Website –Hosting and Domain– Different platforms for website creation- Introduction to SERP- What are search engines- How search engines work- Major functions of a search engine- What are keywords - Different types of keywords- Google keyword planner tool.

UNIT III-MISC TOOLS- GOOGLE WEBMASTER TOOLS

Site Map Creators- Browser-based analysis tools-Page Rank tools-pinging & indexing tools- Dead links identification tools- Open site explorer Domain information/ whois tools- Quick sprou

UNIT IV –LEADMANAGEMENT&DIGITAL MARKETING

Web to lead forms- Web to case forms- Lead generation techniques- Leads are everywhere- Social media and lead gen Inbuilt tools for Digital Marketing-Ip Tracker- CPC reduction (in caseof paid ads) Group posting on Social Media platforms.

UNIT V -TRENDING DIGITAL MARKETING SKILLS

Search Engine Optimization(SEO)-Search EngineMarketing(SEM).-Social Media Marketing/Optimization- Email Marketing. Website :Product Marketing- Content Writing. Marketing the created content online Copywriting- Blogging- Local Marketing. Google Ad Words - Campaign Management- PPC Advertising- Affiliate Marketing. Mobile and SMS Marketing- Marketing Automation-Web Analytics- Growth Hacking.

Duration:45 Hours

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DEPARTMENT OF COMPUTER SCIENCE ANDENGINEERING

Value Added Courses

225150DS-DATA SCIENCE

UNIT I INTRODUCTION TO DATA SCIENCE

Need for data science – benefits and uses – facets of data – data science process – setting the research goal – retrieving data – cleansing, integrating, and transforming data – exploratory data analysis – build the models – presenting and building applications.

UNIT II DESCRIPTIVE ANALYTICS

Frequency distributions – Outliers –interpreting distributions – graphs – averages - describing variability – interquartile range – variability for qualitative and ranked data - Normal distributions – z scores –correlation

– scatter plots – regression – regression line – least squares regression line

– standard error of estimate – interpretation of r^2 – multiple regression equations – regression toward the mean.

UNIT III INFERENTIAL STATISTICS

Populations – samples – random sampling – Sampling distribution- standard error of the mean - Hypothesis testing – z-test – z-test procedure

–decision rule – calculations – decisions – interpretations - one-tailed and two-tailed tests – Estimation – point estimate – confidence interval – level of confidence – effect of sample size.

UNIT IV ANALYSIS OF VARIANCE

t-test for one sample – sampling distribution of t – t-test procedure – t-test for two independent samples – p-value – statistical significance – t-test for two related samples. F-test – ANOVA – Two- factor experiments – three f-tests – two-factor ANOVA –Introduction to chi-square tests.

UNIT V PREDICTIVE ANALYTICS

Linear least squares – implementation – goodness of fit – testing a linear model – weighted resampling. Regression using StatsModels – multiple regression – nonlinear relationships – logistic regression – estimating parameters – Time series analysis – moving averages – missing values – serial correlation – autocorrelation. Introduction to survival analysis.

Duration:45 Hours

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SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF CIVIL ENGINEERING

MEETING OF BOARD OF STUDIES IN CIVIL ENGINEERING

The Meeting of the Board of Studies in civil Engineering was held on 21.04.2021(Online) at 2.30 PM under the chairmanship of Dr. ASHUTOSH DAS

The following Members were present for the meeting:

Meeting link: https://meet.google.com/xms-ngdd-asy

S.No.	Name of the Member	Position	Role
1	Dr. ASHUTOSH DAS	Professor	Chair Person
2	MRS.V.RAMYA	Assistant Professor-Government College of Engineering, Sengipatti	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	D.JEYAKUMAR	Assistant Professor	Internal Member
10	A.BELCIYA MARY	Assistant Professor	Internal Member
11	K.SHANTHI	Assistant Professor	Internal Member
12	J.SANTHIYAA JENIFER	Assistant Professor	Internal Member
13	R.DEVI	Assistant Professor	Internal Member
14	P.VENKATESWARAN	Assistant Professor	Internal Member
15	S.RAVISHANKAR	Assistant Professor	Internal Member
16	M.KARPAGAM	Assistant Professor	Internal Member
17	T.VIDHUDHALAI	Assistant Professor	Internal Member
18	S.VENNILA	Assistant Professor	Internal Member

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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. For various programmers offered by the Department and also the details of feedback on curriculum received from the various stake holders during the Academic year 2020-2021.

After thorough scrutiny of the curriculum and Syllabi and the details of feedback on curriculum received from the Stake holders during the Year 2020-2021, the members of the Board have unanimously passed the following resolutions:

- The Board scrutinized the abstract of stake holder Feedback on B.Tech (CIVIL ENGINEERING)-Full Time curriculum and resolved to revise the curriculum with effect from 2021-2022.
- The members of the board scrutinized the Feedback of stake holder and Programmers are resolved to revise the curriculum for the Academic Year 2021-2022 for the following programmers and recommend to the academic year B.Tech (Civil Engineering) Full Time.
- The members of the board also scrutinized and updated the panel of examiners for B.Tech FT/PT and recommended for the Academic Council for its approval.
- The members of the board also scrutinized and updated the panel of examiners for M.Tech FT/PT and recommended for the Academic Council for its approval.
- Resolved to introduce the following courses in B.Tech (CIVIL Engineering)-Full Time curriculum with effect from 2021-22 as per the guidelines of the All India Council for Technical Education:

Sem I: Professional English – I

Sem I: Matrices and Calculus

Sem II: Professional English – II

Sem II: Statistics and Numerical

Sem II: Basic Electrical, Electronics and Instrumentation Engineering Laboratory

Sem III: Construction Materials and Technology

Sem III: Water Supply and Wastewater Engineering

Sem III: Surveying and Levelling

Sem III: Surveying and Levelling Laboratory

Sem III: Professional Development

Sem IV: Highway and Railway Engineering

Sem IV: Environmental Sciences and Sustainability

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Sem V: Materials Testing Laboratory

Sem VI: Hydrology and Water Resource Engineering

Sem VI: Building Drawing and Detailing Laboratory

Sem VII: Human Values and Ethics

Sem VII: Total Quality Management

- Resolved to introduce the following Elective courses in B.Tech (CIVIL Engineering)-Full Time curriculum with effect from 2021-22 as per the guidelines of the All India Council for Technical Education.

Sem –V: Elective I

S.No	Name of the Subject
1	Dynamics and Earthquake Resistant Structures
2	Introduction to Finite Element Method
3	Steel Concrete Composite Structures
4	Environmental Quality Monitoring
5	Transport and Environment
6	Rainwater Harvesting
7	Marine Geotechnical Engineering

Sem –V: Elective II

S.No	Name of the Subject
1	Formwork Engineering
2	Digitalized Construction Lab
3	Sustainable Construction And Lean Construction
4	Environmental Quality Monitoring
5	Coastal Engineering
6	Ocean Wave Dynamics

Sem –V: Elective III

S.No	Name of the Subject
1	Rock Mechanics
2	Earth and Earth Retaining Structures
3	Tunneling Engineering
4	Soil Dynamics and Machine Foundations
5	Port and Harbour Engineering
6	Watershed Conservation and Management

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Sem –VI: Elective IV

S.No	Name of the Subject
1	Satellite Image Processing
2	Cartography and GIS
3	Photogrammetry
4	Airborne and Terrestrial Laser Mapping
5	Hydrographic Surveying
6	Participatory Water Resources Management
7	Design of Plate and Shell Structures

Sem –VI: Elective V

S.No	Name of the Subject
1	Smart Cities
2	Intelligent Transport Systems
3	Transportation Planning Process
4	Coastal Hazards and Mitigation
5	Solid and Hazardous Waste Management
6	Green Building Design
7	Powerplant Structures

Sem –VI: Elective VI

S.No	Name of the Subject
1	Climate Change Adaptation and Mitigation
2	Environmental Health and Safety
3	Industrial Wastewater Management
4	Coastal Zone Management and Remote Sensing
5	Computational Fluid Dynamics
6	Earth and Rock fill Dams
7	Finance for Engineers

- Resolved to introduce the following Open Elective courses in B.Tech (CIVIL Engineering)-Full Time curriculum with effect from 2021-22 as per the guidelines of the All India Council for Technical Education:

Sem VI; IOT Concepts and Applications

Sem VI; Augmented and Virtual Reality (CSE)

Sem VII: Data Science Fundamentals

Sem VII: Artificial Intelligence andMachineLearning Fundamentals

Sem VII: English for CompetitiveExaminations

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Sem VII: Electric and Hybrid Vehicle

Sem VII: Introduction to non-Destructive testing

Sem VII: Industrial Management

Sem VII: Fundamentals of Electronic Devices and Circuits

Sem VII: Additive Manufacturing

Sem VII: Electrical, Electronic and Magnetic materials

Sem VII: Wearable devices

Sem VII: Medical Informatics

- 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:
  - ✓ Navisworks
  - ✓ PRIMAVERA
  - ✓ BIM
  - ✓ 3Ds Max
- The meeting was concluded with thanks from the Board of Studies Chairman

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Signature of the members:

S.No.	Name of the Member	Signature of the Member
1	Dr. ASHUTOSH DAS	
2	Mrs.V.RAMYA	
3	Mr.P.VADIVEL	
4	Dr.IRAI.KARKUZHALI	
5	Dr.P.PARAMAGURU	
6	Dr.R.SIVA SAMUNDY	
7	D.AMAL COLINS	
8	S.RAMAKRISHNAN	
9	D.JEYAKUMAR	
10	A.BELCIYA MARY	
11	K.SHANTHI	
12	J.SANTHIYAA JENIFER	
13	R.DEVI	
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SEMESTER I

Sl.No	Course Code	COURSE TITLE	Periods Per Week			Credit
			L	T	P	
1.	21147IP	Induction Programme				
		THEORY				
2	21147S11	Professional English-I	3	0	0	3
3	21148S12	Matrices and Calculus	3	1	0	4
4	21149S13	Engineering Physics	3	0	0	3
5	21149S14	Engineering Chemistry	3	0	0	3
6	21150S15	Problem Solving and Python Programming	3	0	0	3
		PRACTICALS				
7	21150L16	Problem Solving and Python Programming Laboratory	0	0	4	2
8	21149L17	Physics and Chemistry Laboratory	0	0	4	2
		TOTAL	**15**	**1**	**10**	**21**

SEMESTER II

SI. No	Course Code	CO URSE TITLE	L	T	P	C
		THEORY				
1.	21147S21	Professional English-II	3	0	0	3
2.	21148S22	Statistics and Numerical Methods	3	1	0	4
3.	21149S23E	Physics for Civil Engineering	3	0	0	3
4.	21154S24	Engineering Graphics	2	0	4	4
5.	21153S25C	Basic Electrical, Electronics and Instrumentation Engineering	3	0	0	3
		PRACTICALS				
6.	21154L21	Engineering Practices Laboratory	0	0	4	2
7.	21153L22D	Basic Electrical, Electronics And Instrumentation Engineering Laboratory	0	0	4	2
		TOTAL	**14**	**1**	**16**	**23**

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SEMESTER III

S. No	Sub.Code	Name of the Subject	L	T	P	C
		THEORY				
1	21148S31D	Transforms and Partial Differential Equations	3	1	0	4
2	21154S32	Engineering Mechanics	3	0	0	3
3	21155C33	Fluid Mechanics	3	0	0	3
4	21155C34	Construction Materials and Technology	3	0	0	3
5	21155C35	Water Supply and Wastewater Engineering	4	0	0	4
6	21155C36	Surveying and Levelling	3	0	0	3
		PRACTICALS				
7	21155L37	Surveying and LevellingLaboratory	0	0	4	2
8	21155L38	Water and Wastewater Analysis Laboratory	0	0	4	2
9	21155L39	Professional Development	0	0	2	1
		TOTAL	**19**	**1**	**10**	**25**

SEMESTER IV

S. No	Sub. Code	Name of the Subject	L	T	P	C
		THEORY				
1	21155C41	Applied Hydraulics Engineering	3	1	0	4
2	21155C42	Strength of Materials	3	0	0	3
3	21155C43	Concrete Technology	3	0	0	3
4	21155C44	Soil Mechanics	3	0	0	3
5	21155C45	Highway and Railway Engineering	3	0	0	3
6	21149S46	Environmental Sciences and Sustainability	3	0	0	3
		PRACTICALS				
7	21155L47	Hydraulic Engineering Laboratory	0	0	4	2
8	21155L48	Materials Testing Laboratory	0	0	4	2
9	21155L49	Soil Mechanics Laboratory	0	0	4	2
		TOTAL	**18**	**1**	**12**	**25**

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SEMESTER– V

S.No	Sub.Code	Name of the Subject	L	T	P	C
		THEORY				
1	21155C51	Design of Reinforced Concrete Structural Elements	3	0	0	3
2	21155C52	Structural Analysis I	3	0	0	3
3	21155C53	Foundation Engineering	3	0	0	3
4	21155E54_	Elective I	3	0	0	3
5	21155E55_	Elective II	3	0	0	3
6	21155E56_	Elective III	3	0	0	3
7	21147MC51	Mandatory Course-I	3	0	0	0
		PRACTICALS				
8	21155L58	Highway Engineering Laboratory	0	0	4	2
9	21155L59	Survey Camp(2weeks)	0	0	0	1
		TOTAL	**21**	**0**	**4**	**21**

SEMESTER – VI

S.No	Sub. Code	Name of the Subject	L	T	P	C
		THEORY				
1	21150OE61_	Open Elective–I	3	0	0	3
2	21155C62	Design of Steel Structural Elements	3	0	0	3
3	21155C63	Structural Analysis II	3	0	0	3
4	21155C64	Hydrology and Water Resource Engineering	3	0	0	3
5	21155E65_	Elective IV	3	0	0	3
6	21155E66_	Elective V	3	0	0	3
7	21155E67_	Elective VI	3	0	0	3
8	21147MC61_	Mandatory Course-II	3	0	0	0
		PRACTICALS				
7	21155L69	Building Drawing and Detailing Laboratory	0	0	4	2
		TOTAL	**24**	**0**	**4**	**23**

SEMESTER –VII

S. No	Sub. Code	Name of the Subject	L	T	P	C
		THEORY				
1	21147S71	Human Values and Ethics	2	0	0	2
2	21150OE72_	Open Elective–II	3	0	0	3
3	211__OE73_	Open Elective–III	3	0	0	3
4	211__OE74_	Open Elective–IV	3	0	0	3

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5	21155C75	Estimation, Costing and Valuation Engineering	3	0	0	3
6	21155C76	Irrigation Engineering and Drawing	3	0	0	3
7	21160S77	Total Quality Management	3	0	0	3
		TOTAL	**20**	**0**	**0**	**20**

SEMESTER–VIII

S.No	Sub.Code	Name of the Subject	L	T	P	C
1	21155PW81	Project Work	0	0	20	10
		TOTAL	0	0	20	10

TOTAL CREDITS:168

MANDATORYCOURSES I
SEM V

S. No	Sub.Code	Name of the Subject	L	T	P	C
1	21147MC51A	Introduction to Women and Gender Studies	3	0	0	0
2	21147MC51B	Elements of Literature	3	0	0	0
3	21147MC51C	Film Appreciation	3	0	0	0
4	21147MC51D	Disaster Management	3	0	0	0

MANDATORY COURSES II
SEM VI

S. No	Sub.Code	Name of the Subject	L	T	P	C
1	21147MC61A	Well Being with Traditional Practices (Yoga, Ayurveda and Siddha)	3	0	0	0
2	21147MC61B	History of Science and Technology in India	3	0	0	0
3	21147MC61C	Political and Economic Thought for a Humane Society	3	0	0	0
4	21147MC61D	State, Nation Building And Politics in India	3	0	0	0
5	21147MC61E	Safety In Engineering Industries	3	0	0	0

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LIST OF ELECTIVES

SEMESTER–V

ELECTIVE I

S.No	Sub. Code	Name of the Subject	L	T	P	C
1	21155E54A	Airports and Harbours	3	0	0	3
2	21155E54B	Concrete Structures	3	0	0	3
3	21155E54C	Groundwater Engineering	3	0	0	3
4	21155E54D	Dynamics and Earthquake Resistant Structures	3	0	0	3
5	21155E54E	Introduction to Finite Element Method	3	0	0	3
6	21155E54F	Steel Concrete Composite Structures	3	0	0	3
7	21155E54G	Environmental Quality Monitoring	3	0	0	3
8	21155E54H	Transport and Environment	3	0	0	3
9	21155E54I	Rainwater Harvesting	3	0	0	3
10	21155E54J	Marine Geotechnical Engineering	3	0	0	3

ELECTIVE II

S.No	Sub.Code	Name of the Subject	L	T	P	C
1	21155E55A	Steel Structures	3	0	0	3
2	21155E55B	Air and Noise Pollution Control Engineering	3	0	0	3
3	21155E55C	Rehabilitation/ Heritage Restoration	3	0	0	3
4	21155E55D	Formwork Engineering	3	0	0	3
5	21155E55E	Digitalized Construction Lab	3	0	0	3
6	21155E55F	Sustainable Construction And Lean Construction	3	0	0	3
7	21155E55G	Environmental Quality Monitoring	3	0	0	3
8	21155E55H	Coastal Engineering	3	0	0	3
9	21155E55I	Ocean Wave Dynamics	3	0	0	3

ELECTIVE III

S.No	Sub.Code	Name of the Subject	L	T	P	C
1	21155E56A	Water Quality and Management	3	0	0	3
2	21155E56B	Prefabricated Structures	3	0	0	3
3	21155E56C	Total Station and GPS Surveying	3	0	0	3
4	21155E56D	Rock Mechanics	3	0	0	3
5	21155E56E	Earth and Earth Retaining Structures	3	0	0	3
6	21155E56F	Tunneling Engineering	3	0	0	3
7	21155E56G	Soil Dynamics and Machine Foundations	3	0	0	3
8	21155E56H	Port and Harbour Engineering	3	0	0	3
9	21155E56I	Watershed Conservation and Management	3	0	0	3

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SEMESTER – VI

ELECTIVE IV

S.No	Sub.Code	Name of the Subject	L	T	P	C
1	21155E65A	Prestressed Concrete Structures	3	0	0	3
2	21155E65B	Water Resources Systems Engineering	3	0	0	3
3	21155E65C	Remote Sensing Concepts	3	0	0	3
4	21155E65D	Satellite Image Processing	3	0	0	3
5	21155E65E	Cartography and GIS	3	0	0	3
6	21155E65F	Photogrammetry	3	0	0	3
7	21155E65G	Airborne and Terrestrial Laser Mapping	3	0	0	3
8	21155E65H	Hydrographic Surveying	3	0	0	3
9	21155E65I	Participatory Water Resources Management	3	0	0	3
10	21155E65J	Design of Plate and Shell Structures	3	0	0	3

ELECTIVE V

S.No	Sub.Code	Name of the Subject	L	T	P	C
1	21155E66A	Pile Foundation	3	0	0	3
2	21155E66B	Urban Planning and Development	3	0	0	3
3	21155E66C	Construction Equipment and Machinery	3	0	0	3
4	21155E66D	Smart Cities	3	0	0	3
5	21155E66E	Intelligent Transport Systems	3	0	0	3
6	21155E66F	Transportation Planning Process	3	0	0	3
7	21155E66G	Coastal Hazards and Mitigation	3	0	0	3
8	21155E66H	Solid and Hazardous Waste Management	3	0	0	3
9	21155E66I	Green Building Design	3	0	0	3
10	21155E66J	Power plant Structures	3	0	0	3

ELECTIVE VI

S.No	Sub.Code	Name of the Subject	L	T	P	C
1	21155E67A	Advanced Construction Techniques	3	0	0	3
2	21155E67B	Traffic Engineering and Management	3	0	0	3
3	21155E67C	Dynamics and Earthquake Resistant Structures	3	0	0	3
4	21155E67D	Climate Change Adaptation and Mitigation	3	0	0	3
5	21155E67E	Environmental Health and Safety	3	0	0	3
6	21155E67F	Industrial Wastewater Management	3	0	0	3
7	21155E67G	Coastal Zone Management and Remote Sensing	3	0	0	3
8	21155E67H	Computational Fluid Dynamics	3	0	0	3
9	21155E67I	Earth and Rockfill Dams	3	0	0	3
10	21155E67J	Finance for Engineers	3	0	0	3

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SEMESTER VI
OPEN ELECTIVE-I

S.No	Sub.Code	Name of the Subject	L	T	P	C
1	21150OE61A	IoT Concepts and Applications (CSE)	2	0	2	3
2	21150OE61B	Augmented and Virtual Reality (CSE)	2	0	2	3

SEMESTER VII
OPEN ELECTIVE-II

S.No	Sub.Code	Name of the Subject	L	T	P	C
1	21150OE72A	Data Science Fundamentals (CSE)	2	0	2	3
2	21150OE72B	Artificial Intelligence and MachineLearning Fundamentals	2	0	2	3

OPEN ELECTIVE-III

S.No	Sub.Code	Name of the Subject	L	T	P	C
1	21147OE73A	English for CompetitiveExaminations	3	0	0	3
2	21153OE73A	Renewable EnergyTechnologies	3	0	0	3
3	21153OE73B	Electric and Hybrid Vehicle	3	0	0	3
4	21154OE73A	Introduction to non-Destructive testing	3	0	0	3
5	21154OE73B	Industrial Management	3	0	0	3
5	21152OE73A	Biomedical Instrumentation	3	0	0	3
6	21152OE73B	Fundamentals of Electronic Devices and Circuits	3	0	0	3

OPEN ELECTIVE-IV

S.No	Sub.Code	Name of the Subject	L	T	P	C
1	21154OE74A	Additive Manufacturing	3	0	0	3
2	21154OE74B	Industrial safety	3	0	0	3
3	21153OE74A	Sensors	3	0	0	3
4	21153OE74B	Electrical, Electronic andMagnetic materials	3	0	0	3
5	21152OE75A	Wearable devices	3	0	0	3
6	21152OE77B	Medical Informatics	3	0	0	3

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21147S11 PROFESSIONAL ENGLISH I L T P C 3 0 0 3

COURSE OBJECTIVES:

- To improve the communicative competence of learners
- To learn to use basic grammatic structures in suitable contexts
- To acquire lexical competence and use them appropriately in a sentence and understand their meaning in a text
- To help learners use language effectively in professional contexts
- To develop learners' ability to read and write complex texts, summaries, articles, blogs, definitions, essays and user manuals.

UNIT I INTRODUCTION TO EFFECTIVE COMMUNICATION 1

What is effective communication? (Explain using activities) Why is communication critical for excellence during study, research and work?What are the seven C's of effective communication?What are key language skills?What is effective listening? What does it involve?What is effective speaking?What does it mean to be an excellent reader? What should you be able to do?What is effective writing? How does one develop language and communication skills?What does the course focus on? How are communication and language skills going to be enhanced during this course? What do you as a learner need to do to enhance your English language and communication skills to get the best out of this course?

INTRODUCTION TO FUNDAMENTALS OF COMMUNICATION 8

Reading - Reading brochures (technical context), telephone messages / social media messages relevant to technical contexts and emails. Writing - Writing emails / letters introducing oneself. Grammar - Present Tense (simple and progressive); Question types: Wh/ Yes or No/ and Tags. Vocabulary - Synonyms; One word substitution; Abbreviations & Acronyms (as used in technical contexts).

UNIT II NARRATION AND SUMMATION 9

Reading - Reading biographies, travelogues, newspaper reports, Excerpts from literature, and travel & technical blogs. Writing - Guided writing-- Paragraph writing Short Report on an event (field trip etc.) Grammar –Past tense (simple); Subject-Verb Agreement; and Prepositions. Vocabulary - Word forms (prefixes& suffixes); Synonyms and Antonyms. Phrasal verbs.

UNIT III DESCRIPTION OF A PROCESS / PRODUCT 9

Reading – Reading advertisements, gadget reviews; user manuals. Writing - Writing definitions; instructions; and Product /Process description. Grammar - Imperatives; Adjectives; Degrees of comparison; Present & Past Perfect Tenses. Vocabulary - Compound Nouns, Homonyms; and Homophones, discourse markers (connectives & sequence words).

UNIT IV CLASSIFICATION AND RECOMMENDATIONS 9

Reading – Newspaper articles; Journal reports –and Non Verbal Communcation (tables, pie charts etc,.). Writing – Note-making / Note-taking (*Study skills to be taught, not tested); Writing recommendations; Transferring information from non verbal (chart , graph etc, to verbal mode) Grammar – Articles; Pronouns - Possessive & Relative pronouns. Vocabulary - Collocations; Fixed / Semi fixed expressions.

UNIT V EXPRESSION 9

Reading – Reading editorials; and Opinion Blogs; Writing – Essay Writing (Descriptive or narrative). Grammar – Future Tenses, Punctuation; Negation (Statements & Questions); and Simple,

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Compound & Complex Sentences. Vocabulary - Cause & Effect Expressions – Content vs Function words.

LEARNING OUTCOMES : **TOTAL : 45 PERIODS**

At the end of the course, learners will be able

CO1: To use appropriate words in a professional context

CO2: To gain understanding of basic grammatical structures and use them in right context.

CO3: To read and infer the denotative and connotative meanings of technical texts

CO4: To read and interpret information presented in tables, charts and other graphic forms

CO5: To write definitions, descriptions, narrations and essays on various topics

TEXT BOOKS :

1. English for Engineers & Technologists Orient Blackswan Private Ltd. Department of English, Anna University, (2020 edition)

2. English for Science & Technology Cambridge University Press, 2021.

Authored by Dr. Veena Selvam, Dr. Sujatha Priyadarshini, Dr. Deepa Mary Francis, Dr. KN. Shoba, and Dr. Lourdes Joevani, Department of English, Anna University.

REFERENCES:

1. Technical Communication – Principles And Practices By Meenakshi Raman & Sangeeta Sharma, Oxford Univ. Press, 2016, New Delhi.
2. A Course Book On Technical English By Lakshminarayanan. Scitech Publications (India) Pvt. Ltd.
3. English For Technical Communication (With CD) By Aysha Viswamohan. Mcgraw Hill Education, ISBN : 0070264244.
4. Effective Communication Skill. Kulbhusan Kumar, RS Salaria, Khanna Publishing House.
5. Learning to Communicate – Dr. V. Chellammal, Allied Publishing House, New Delhi,2003.

ASSESSMENT PATTERN

Two internal assessments and an end semester examination to test students' reading and writing skills along with their grammatical and lexical competence.

CO's-PO's & PSO's MAPPING

CO	PO									PSO					
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	1	1	1	1	1	3	3	3	1	3	-	3	-	-	-
2	1	1	1	1	1	3	3	3	1	3	-	3	-	-	-
3	2	3	2	3	2	3	3	3	2	3	3	3	-	-	-
4	2	3	2	3	2	3	3	3	2	3	3	3	-	-	-
5	2	3	3	3	-	3	3	3	2	3	-	3	-	-	-
AVg.	1.6	2.2	1.8	2.2	1.5	3	3	3	1.6	3	3	3	-	-	-

- 1-low, 2-medium, 3-high, '-'- no correlation
- **Note:** The average value of this course to be used for program articulation matrix.

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Department of Civil Engineering
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Science & Technology (Prist)
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21148S12 MATRICES AND CALCULUS L T P C 3 1 0 4

COURSE OBJECTIVES:

- To develop the use of matrix algebra techniques that is needed by engineers for practical applications.
- To familiarize the students with differential calculus.
- To familiarize the student with functions of several variables. This is needed in many branches of engineering.
- To make the students understand various techniques of integration.
- To acquaint the student with mathematical tools needed in evaluating multiple integrals and their applications.

UNIT I MATRICES 9+3

Eigenvalues and Eigenvectors of a real matrix – Characteristic equation – Properties of Eigenvalues and Eigenvectors – Cayley - Hamilton theorem – Diagonalization of matrices by orthogonal transformation – Reduction of a quadratic form to canonical form by orthogonal transformation – Nature of quadratic forms – Applications : Stretching of an elastic membrane.

UNIT II DIFFERENTIAL CALCULUS 9+3

Representation of functions - Limit of a function - Continuity - Derivatives - Differentiation rules (sum, product, quotient, chain rules) - Implicit differentiation - Logarithmic differentiation - Applications : Maxima and Minima of functions of one variable.

UNIT III FUNCTIONS OF SEVERAL VARIABLES 9+3

Partial differentiation – Homogeneous functions and Euler's theorem – Total derivative – Change of variables – Jacobians – Partial differentiation of implicit functions – Taylor's series for functions of two variables – Applications : Maxima and minima of functions of two variables and Lagrange's method of undetermined multipliers.

UNIT IV INTEGRAL CALCULUS 9+3

Definite and Indefinite integrals - Substitution rule - Techniques of Integration : Integration by parts, Trigonometric integrals, Trigonometric substitutions, Integration of rational functions by partial fraction, Integration of irrational functions - Improper integrals - Applications : Hydrostatic force and pressure, moments and centres of mass.

UNIT V MULTIPLE INTEGRALS 9+3

Double integrals – Change of order of integration – Double integrals in polar coordinates – Area enclosed by plane curves – Triple integrals – Volume of solids – Change of variables in double and triple integrals – Applications : Moments and centres of mass, moment of inertia.

TOTAL : 60 PERIODS

COURSE OUTCOMES :

At the end of the course the students will be able to

CO1 Use the matrix algebra methods for solving practical problems.
CO2 Apply differential calculus tools in solving various application problems.
CO3 Able to use differential calculus ideas on several variable functions.
CO4 Apply different methods of integration in solving practical problems.
CO5 Apply multiple integral ideas in solving areas, volumes and other practical problems.

TEXTBOOKS :

1. Kreyszig.E, "Advanced Engineering Mathematics", John Wiley and Sons, 10th Edition, New Delhi, 2016.

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Ponnaiyah Ramajayam Institute of
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2. Grewal.B.S., "Higher Engineering Mathematics", Khanna Publishers, New Delhi, 44th Edition, 2018.

3. James Stewart, "Calculus : Early Transcendentals", Cengage Learning, 8th Edition, New Delhi, 2015. [For Units II & IV - Sections 1.1, 2.2, 2.3, 2.5, 2.7 (Tangents problems only), 2.8, 3.1 to 3.6, 3.11, 4.1, 4.3, 5.1 (Area problems only), 5.2, 5.3, 5.4 (excluding net change theorem), 5.5, 7.1 - 7.4 and 7.8].

REFERENCES :

1. Anton. H, Bivens. I and Davis. S, " Calculus ", Wiley, 10th Edition, 2016

2. Bali. N., Goyal. M. and Watkins. C., "Advanced Engineering Mathematics", Firewall Media (An imprint of Lakshmi Publications Pvt., Ltd.,), New Delhi. 7th Edition, 2009.

3. Jain. R.K. and Iyengar. S.R.K., "Advanced Engineering Mathematics", Narosa Publications, New Delhi, 5th Edition, 2016.

4. Narayanan. S. and Manicavachagom Pillai. T. K.,"Calculus" Volume I and II, S. Viswanathan Publishers Pvt. Ltd., Chennai, 2009.

5. Ramana. B.V., "Higher Engineering Mathematics", McGraw Hill Education Pvt. Ltd, New Delhi, 2016.

6. Srimantha Pal and Bhunia. S.C, "Engineering Mathematics " Oxford University Press, 2015.

7. Thomas. G. B., Hass. J. and Weir. M.D, "Thomas Calculus", 14th Edition, Pearson India, 2018.

CO's-PO's & PSO's MAPPING

	PO 01	PO 02	PO 03	PO 04	PO 05	PO 06	PO 07	PO 08	PO 09	PO 10	PO 11	PO 12	PS O1	PS O2	PS O3
CO1	3	3	1	1	0	0	0	0	2	0	2	3	-	-	-
CO2	3	3	1	1	0	0	0	0	2	0	2	3	-	-	-
CO3	3	3	1	1	0	0	0	0	2	0	2	3	-	-	-
CO4	3	3	1	1	0	0	0	0	2	0	2	3	-	-	-
CO5	3	3	1	1	0	0	0	0	2	0	2	3	-	-	-
Avg	3	3	1	1	0	0	0	0	2	0	2	3	-	-	-

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21147S21 **PROFESSIONAL ENGLISH II** L T P C 2 0 0 2

COURSE OBJECTIVES:

- To engage learners in meaningful language activities to improve their reading and writing skills
- To learn various reading strategies and apply in comprehending documents in professional context.
- To help learners understand the purpose, audience, contexts of different types of writing
- To develop analytical thinking skills for problem solving in communicative contexts
- To demonstrate an understanding of job applications and interviews for internship and placements

UNIT I MAKING COMPARISONS 6

Reading - Reading advertisements, user manuals, brochures; Writing – Professional emails, Email etiquette - Compare and Contrast Essay; Grammar – Mixed Tenses, Prepositional phrases

UNIT II EXPRESSING CAUSAL RELATIONS IN SPEAKING AND WRITING 6

Reading - Reading longer technical texts– Cause and Effect Essays, and Letters / emails of complaint, Writing - Writing responses to complaints.Grammar - Active Passive Voice transformations, Infinitive and Gerunds

UNIT III PROBLEM SOLVING 6

Reading - Case Studies, excerpts from literary texts, news reports etc. Writing – Letter to the Editor, Checklists, Problem solution essay / Argumentative Essay. Grammar – Errorcorrection; If conditional sentences

UNIT IV REPORTING OF EVENTS AND RESEARCH 6

Reading –Newspaper articles;Writing – Recommendations, Transcoding, Accident Report, Survey Report Grammar – Reported Speech,Modals Vocabulary – Conjunctions- use of prepositions

UNIT V THE ABILITY TO PUT IDEAS OR INFORMATION COGENTLY 6

Reading – Company profiles, Statement of Purpose, (SOP), an excerpt of interview with professionals; Writing – Job / Internship application – Cover letter & Resume; Grammar - Numerical adjectives, Relative Clauses.

TOTAL : 30 PERIODS

COURSE OUTCOMES:

At the end of the course, learners will be able

CO1 To compare and contrast products and ideas in technical texts.

CO2 To identify and report cause and effects in events, industrial processes through technical texts

CO3 To analyse problems in order to arrive at feasible solutions and communicate them in the written format.

CO4 To present their ideas and opinions in a planned and logical manner

CO5 To draft effective resumes in the context of job search.

TEXT BOOKS :

1. English for Engineers & Technologists (2020 edition) Orient Blackswan Private Ltd. Department of English, Anna University.
2. English for Science & Technology Cambridge University Press 2021.

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

3. Authored by Dr. Veena Selvam, Dr. Sujatha Priyadarshini, Dr. Deepa Mary Francis, Dr. KN. Shoba, and Dr. Lourdes Joevani, Department of English, Anna University.

REFERENCES:

1. Raman. Meenakshi, Sharma. Sangeeta (2019). Professional English. Oxford university press. New Delhi.
2. Improve Your Writing ed. V.N. Arora and Laxmi Chandra, Oxford Univ. Press, 2001, NewDelhi.
3. Learning to Communicate – Dr. V. Chellammal. Allied Publishers, New Delhi, 2003
4. Business Correspondence and Report Writing by Prof. R.C. Sharma & Krishna Mohan, Tata McGraw Hill & Co. Ltd., 2001, New Delhi.
5. Developing Communication Skills by Krishna Mohan, Meera Bannerji- Macmillan India Ltd. 1990, Delhi.

ASSESSMENT PATTERN

Two internal assessments and an end semester examination to test students' reading and writing skills along with their grammatical and lexical competence.

COs- PO's & PSO's MAPPING

CO	PO												PSO		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	3	3	3	3	3	3	3	3	2	3	3	3	-	-	-
2	3	3	3	3	3	3	3	3	2	3	3	3	-	-	-
3	3	3	3	3	3	3	3	3	2	3	3	3	-	-	-
4	3	3	3	3	2	3	3	3	2	3	3	3	-	-	-
5	-	-	-	-	-	-	-	-	3	3	3	3	-	-	-
AVg.	3	3	3	3	2.75	3	3	3	2.2	3	3	3	-	-	-

- 1-low, 2-medium, 3-high, '-"- no correlation

Note: The average value of this course to be used for program articulation matrix

R. Dey
Head of the Department
Department of Civil Engineering
Ponnaiyah Ramajayam Institute of
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21148S22 **STATISTICS AND NUMERICAL METHODS** L T P C
3 1 0 4

COURSE OBJECTIVES:

- This course aims at providing the necessary basic concepts of a few statistical and numerical methods and give procedures for solving numerically different kinds of problems occurring in engineering and technology.
- To acquaint the knowledge of testing of hypothesis for small and large samples which plays an important role in real life problems.
- To introduce the basic concepts of solving algebraic and transcendental equations.
- To introduce the numerical techniques of interpolation in various intervals and numerical techniques of differentiation and integration which plays an important role in engineering and technology disciplines.
- To acquaint the knowledge of various techniques and methods of solving ordinary differential equations.

UNIT I TESTING OF HYPOTHESIS 9+3

Sampling distributions - Tests for single mean, proportion and difference of means (Large and small samples) – Tests for single variance and equality of variances – Chi square test for goodness of fit – Independence of attributes.

UNIT II DESIGN OF EXPERIMENTS 9+3

One way and two way classifications - Completely randomized design – Randomized block design – Latin square design - 22 factorial design.

UNIT III SOLUTION OF EQUATIONS AND EIGENVALUE PROBLEMS 9+3

Solution of algebraic and transcendental equations - Fixed point iteration method – Newton Raphson method- Solution of linear system of equations - Gauss elimination method – Pivoting - Gauss Jordan method – Iterative methods of Gauss Jacobi and Gauss Seidel - Eigenvalues of a matrix by Power method and Jacobi's method for symmetric matrices.

UNIT IV INTERPOLATION, NUMERICAL DIFFERENTIATION AND NUMERICAL INTEGRATION 9+3

Lagrange's and Newton's divided difference interpolations – Newton's forward and backward difference interpolation – Approximation of derivates using interpolation polynomials – Numerical single and double integrations using Trapezoidal and Simpson's 1/3 rules.

UNIT V NUMERICAL SOLUTION OF ORDINARY DIFFERENTIAL EQUATIONS 9+3

Single step methods: Taylor's series method - Euler's method - Modified Euler's method - Fourth order Runge-Kutta method for solving first order differential equations - Multi step methods: Milne's and Adams - Bash forth predictor corrector methods for solving first order differential equations.

TOTAL: 60 PERIODS

COURSE OUTCOMES:

Upon successful completion of the course, students will be able to:

CO1 Apply the concept of testing of hypothesis for small and large samples in real life problems.

CO2 Apply the basic concepts of classifications of design of experiments in the field of agriculture.

CO3 Appreciate the numerical techniques of interpolation in various intervals and apply the numerical techniques of differentiation and integration for engineering problems.

CO4 Understand the knowledge of various techniques and methods for solving first and second order ordinary differential equations.

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Ponnaiyah Ramajayam Institute of
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CO5 Solve the partial and ordinary differential equations with initial and boundary conditions by using certain techniques with engineering applications.

TEXT BOOKS:

1. Grewal, B.S., and Grewal, J.S., "Numerical Methods in Engineering and Science", Khanna Publishers, 10th Edition, New Delhi, 2015.

2. Johnson, R.A., Miller, I and Freund J., "Miller and Freund's Probability and Statistics for Engineers", Pearson Education, Asia, 8th Edition, 2015.

REFERENCES:

1. Burden, R.L and Faires, J.D, "Numerical Analysis", 9th Edition, Cengage Learning, 2016.

2. Devore. J.L., "Probability and Statistics for Engineering and the Sciences", Cengage Learning, New Delhi, 8th Edition, 2014.

3. Gerald. C.F. and Wheatley. P.O. "Applied Numerical Analysis" Pearson Education, Asia, New Delhi, 7th Edition, 2007.

4. Gupta S.C. and Kapoor V. K., "Fundamentals of Mathematical Statistics", Sultan Chand & Sons, New Delhi, 12th Edition, 2020.

5. Spiegel. M.R., Schiller. J. and Srinivasan. R.A., "Schaum's Outlines on Probability and Statistics ", Tata McGraw Hill Edition, 4th Edition, 2012.

6. Walpole. R.E., Myers. R.H., Myers. S.L. and Ye. K., "Probability and Statistics for Engineers and Scientists", 9th Edition, Pearson Education, Asia, 2010.

COs- PO's & PSO's MAPPING

	PO 01	PO 02	PO 03	PO 04	PO 05	PO 06	PO 07	PO 08	PO 09	PO 10	PO 11	PO 12	PS O1	PS O2	PS O3
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CO2	3	3	1	1	1	0	0	0	2	0	2	3	-	-	-
CO3	3	3	1	1	1	0	0	0	2	0	2	3	-	-	-
CO4	3	3	1	1	1	0	0	0	2	0	2	3	-	-	-
CO5	3	3	1	1	1	0	0	0	2	0	2	3	-	-	-
Avg	3	3	1	1	1	0	0	0	2	0	2	3	-	-	-

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Department of Civil Engineering
Ponnaiyah Ramajayam Institute of
Science & Technology (Prist)
(Institution Deemed to be University
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Ponnaiyah Ramajayam Institute of
Science and Technology (PRIST)
Deemed to be University
Vallam, Thanjavur-613 403.

21153S25C

BASIC ELECTRICAL, ELECTRONICS AND INSTRUMENTATION ENGINEERING

L T P C
3 0 0 3

COURSE OBJECTIVES:

- To introduce the basics of electric circuits and analysis
- To impart knowledge in domestic wiring
- To impart knowledge in the basics of working principles and application of electrical machines
- To introduce analog devices and their characteristics
- To introduce the functional elements and working of sensors and transducers.

UNIT I ELECTRICAL CIRCUITS 9

DC Circuits: Circuit Components: Conductor, Resistor, Inductor, Capacitor – Ohm's Law - Kirchhoff's Laws – Simple problems- Nodal Analysis, Mesh analysis with Independent sources only (Steady state)

Introduction to AC Circuits and Parameters: Waveforms, Average value, RMS Value, Instantaneous power, real power, reactive power and apparent power, power factor – Steady state analysis of RLC circuits (Simple problems only), Three phase supply – star and delta connection – power in three-phase systems

UNIT II MAGNETIC CIRCUITS AND ELECTRICAL INSTALLATIONS 9

Magnetic circuits-definitions-MMF, flux, reluctance, magnetic field intensity, flux density, fringing, self and mutual inductances-simple problems.

Domestic wiring , types of wires and cables, earthing ,protective devices- switch fuse unit- Miniature circuit breaker-moulded case circuit breaker- earth leakage circuit breaker, safety precautions and First Aid

UNIT III ELECTRICAL MACHINES 9

Construction and Working principle- DC Separately and Self excited Generators, EMF equation, Types and Applications. Working Principle of DC motors, Torque Equation, Types and Applications. Construction, Working principle and Applications of Transformer, Three phase Alternator, Synchronous motor and Three Phase Induction Motor.

UNIT IV ANALOG ELECTRONICS 9

Resistor, Inductor and Capacitor in Electronic Circuits- Semiconductor Materials: Silicon &Germanium – PN Junction Diodes, Zener Diode –Characteristics Applications – Bipolar Junction Transistor-Biasing, JFET, SCR, MOSFET,IGBT – Types, I-V Characteristics and Applications, Rectifier and Inverters, harmonics

UNIT V SENSORS AND TRANSDUCERS 9

Sensors, solenoids, pneumatic controls with electrical actuator, mechatronics, types of valves and its applications, electro-pneumatic systems, proximity sensors, limit switches, piezoelectric, hall effect, photo sensors,Strain gauge, LVDT, differential pressure transducer,optical and digital transducers, Smart sensors, Thermal Imagers.

TOTAL: 45 PERIODS

COURSE OUTCOMES:

After completing this course, the students will be able to

CO1: Compute the electric circuit parameters for simple problems
CO2: Explain the concepts of domestics wiring and protective devices
CO3: Explain the working principle and applications of electrical machines
CO4: Analyze the characteristics of analog electronic devices

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Department of Civil Engineering
Ponnaiyah Ramajayam Institute of
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THANJAVUR - 613 403, TAMILNADU.

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Science and Technology (PRIST)
Deemed to be University
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CO5: Explain the types and operating principles of sensors and transducers

TEXT BOOKS:

1. D P Kothari and I.J Nagarath, "Basic Electrical and Electronics Engineering", McGraw Hill Education (India) Private Limited, Second Edition, 2020
2. A.K. Sawhney, Puneet Sawhney 'A Course in Electrical & Electronic Measurements & Instrumentation', Dhanpat Rai and Co, 2015.
3. S.K. Bhattacharya, Basic Electrical Engineering, Pearson Education, 2019
4. James A Svoboda, Richard C. Dorf, Dorf's Introduction to Electric Circuits, Wiley,2018

REFERENCES:

1. John Bird, "Electrical Circuit theory and technology", Routledge; 2017.

2. Thomas L. Floyd, 'Electronic Devices', 10th Edition, Pearson Education, 2018.

3. Albert Malvino, David Bates, '**Electronic Principles**, McGraw Hill Education; 7th edition, 2017
4. Muhammad H.Rashid, "Spice for Circuits and electronics", 4th Edition., Cengage India,2019.
5. H.S. Kalsi, 'Electronic Instrumentation', Tata McGraw-Hill, New Delhi, 2010

CO's, PO's & PSO's MAPPING

CO's	PO's												PSO's		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	2	1	1					1					-	-	-
2	2	1	1					1					-	-	-
3	2	1	1					1					-	-	-
4	2	1	1					1					-	-	-
5	2	1	1					1					-	-	-
Avg.	2	1	1					1					-	-	-

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Department of Civil Engineering
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21153L22D

BASIC ELECTRICAL, ELECTRONICS AND INSTRUMENTATION ENGINEERING LABORATORY

L T P C
0 0 4 2

COURSE OBJECTIVES:

- To train the students in conducting load tests electrical machines
- To gain practical experience in experimentally obtaining the characteristics of electronic devices and rectifiers
- To train the students to measure three phase power and displacement

List of Experiments

1. Verification of ohms and Kirchhoff's Laws.
2. Three Phase Power Measurement
3. Load test on DC Shunt Motor.
4. Load test on Self Excited DC Generator
5. Load test on Single phase Transformer
6. Load Test on Induction Motor
7. Characteristics of PN and Zener Diodes
8. Characteristics of BJT, SCR and MOSFET
9. Design and analysis of Half wave and Full Wave rectifiers
10. Measurement of displacement of LVDT

TOTAL: 60 PERIODS

COURSE OUTCOMES:

After completing this course, the students will be able to

CO1: Use experimental methods to verify the Ohm's law and Kirchhoff's Law and to measure three phase power

CO2: Analyze experimentally the load characteristics of electrical machines

CO3: Analyze the characteristics of basic electronic devices

CO4: Use LVDT to measure displacement

CO's, PO's & PSO's MAPPING

CO's	PO's												PSO's		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	2	3	1	2				1.5	2				-	-	-
2	2	3	1	2				1.5	2				-	-	-
3	2	3	1	2				1.5	2				-	-	-
4	2	3	1	2				1.5	2				-	-	-
Avg.	1.6	1.4	0.8	1.6				1.2	1.6						

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Department of Civil Engineering
Ponnaiyah Ramajayam Institute of
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21155C34 CONSTRUCTION MATERIALS AND TECHNOLOGY L T P C
3 0 0 3

COURSE OBJECTIVES:

- To introduce students to various construction materials and the techniques that are commonly used in civil engineering construction.

UNIT I STONES - BRICKS - CONCRETE BLOCKS - LIME 9

Stone as building material – Criteria for selection – Tests on stones – Bricks – Classification – Manufacturing of clay bricks – Tests on bricks – Compressive strength – Water Absorption – Efflorescence – Lime – Preparation of lime mortar – Concrete hollow blocks – Lightweight concrete blocks.

UNIT II OTHER MATERIALS 9

Timber – Market forms – Plywood – Veneer – False ceiling materials – Steel – Mechanical treatment – Aluminum – Uses – Market forms – Glass – Ceramics – Refractories – Composite Materials – Types and applications – FRP – Fibre textiles – Geomembranes and Geotextiles for earth reinforcement.

UNIT III CONSTRUCTION PRACTICES & SERVICE REQUIREMENTS 9

Types of Foundations – Shallow and Deep Foundations – Stone Masonry – Brick Masonry – Plastering and Pointing – Cavity Walls – Diaphragm Walls – Formwork – Centering and Shuttering – Shoring – Scaffolding – Underpinning – Roofing – Flooring – Joints in concrete – Contraction/Construction/Expansion joints – Fire Protection – Thermal Insulation – Ventilation and Air conditioning – Acoustics and Sound Insulation – Damp Proofing.

UNIT IV CONSTRUCTION EQUIPMENTS 9

Selection of equipment for earthwork excavation, concreting, material handling and erection of structures – Dewatering and pumping equipment.

UNIT V CONSTRUCTION PLANNING 9

Introduction to construction planning – Scheduling for activities – Critical path method (CPM) and PERT network modelling and time analysis – Case illustrations.

TOTAL: 45 PERIODS

COURSE OUTCOMES

Students will be able to

CO1 Identify the good quality brick, stone and blocks for construction.

CO2 Recognize the market forms of timber, steel, aluminum and applications of various composite materials.

CO3 Identify the best construction and service practices such as thermal insulations and air conditioning of the building

CO4 Select various equipments for construction works conditioning of building

CO5 Understand the construction planning and scheduling techniques

TEXTBOOKS

1. Varghese.P.C, Building Materials, Second Edition PHI Learning Ltd., 2015.
2. Arora S.P and Bindra S.P Building construction, Dhanpat Rai and sons, 2013.

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1. Varghese.P.C, Building Construction, Second Edition PHI Learning ltd., 2016.
2. Punmia ,B.C Building construction , Laxmi publication (p)ltd..,2008.
3. Peurifoy R.L., Schexnayder,C.J., Shapira A., Schmitt.R., Construction Planning Equipment and Methods, Tata McGraw-hill, 2011.
4. Srinath L.S.,PERT and CPM -Principles and applications, Affliated East West Press 2001

Head of the Department
Department of Civil Engineering
Ponnaiyah Ramajayam Institute of
Science & Technology (Prist)
(institution Deemed to be University
U/s 3 of the UGC Act 1956)
THANJAVUR - 613 403, TAMILNADU.

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

COs- PO's & PSO's MAPPING

PO/PSO		Course Outcome					Overall Correlation of CO s to POs
		CO1	CO2	CO3	CO4	CO5	
PROGRAM OUTCOMES(PO)							
PO1	Knowledge of Engineering Sciences	2	3	3	2	2	2
PO2	Problem analysis	2				3	2
PO3	Design / development of solutions					2	1
PO4	Investigation	3	2	2		3	2
PO5	Modern Tool Usage					2	1
PO6	Engineer and Society	2		2			1
PO7	Environment and Sustainability	2	2	3			2
PO8	Ethics						
PO9	Individual and Team work					2	1
PO10	Communication						
PO11	Project Management and Finance			2	2	3	2
PO12	Life Long Learning	2	2			2	2
PROGRAM SPECIFIC OUTCOMES(PSO)							
PSO1	Knowledge of Civil Engineering discipline	3	3	3	3	3	3
PSO2	Critical analysis of Civil Engineering problems and innovation				3	3	2
PSO3	Conceptualization and evaluation of engineering solutions to Civil Engineering Issues		2		2	3	2

R. Dey

Head of the Department
Department of Civil Engineering
Ponnaiyah Ramajayam Institute of
Science & Technology (Prist)
(Institution Deemed to be University
U/s 3 of the UGC Act 1956)
THANJAVUR - 613 403, TAMILNADU.

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

21155C35 WATER SUPPLY AND WASTEWATER ENGINEERING L T P C
4 0 0 4

COURSE OBJECTIVES:

- To introduce students to various components and design of water supply scheme, water treatment methods, water storage distribution system, sewage treatment and disposal and deign of intake structures and sewerage system.

UNIT I WATER SUPPLY 12

Estimation of surface and subsurface water resources - Predicting demand for water- Impurities of water and their significance - Physical, chemical and bacteriological analysis - Waterborne diseases - Standards for potable water. Intake of water: Pumping and gravity schemes.

UNIT II WATER TREATMENT 12

Objectives - Unit operations and processes - Principles, functions, and design of water treatment plant units, aerators of flash mixers, Coagulation and flocculation – Clarifloccuator - Plate and tube settlers - Pulsator clarifier - sand filters - Disinfection - softening, removal of iron and manganese - Defluoridation - Softening - Desalination process - Residue Management - Construction, Operation and Maintenance aspects

UNIT III WATER STORAGE AND DISTRIBUTION 12

Storage and balancing reservoirs - types, location and capacity. Distribution system: layout, hydraulics of pipe lines, pipe fittings, valves including check and pressure reducing valves, meters, analysis of distribution systems, leak detection, maintenance of distribution systems, pumping stations and their operations - House service connections.

UNIT IV PLANNING AND DESIGN OF SEWERAGE SYSTEM 12

Characteristics and composition of sewage - Population equivalent - Sanitary sewage flow estimation - Sewer materials - Hydraulics of flow in sanitary sewers - Sewer design - Storm drainage-Storm runoff estimation - Sewer appurtenances - Corrosion in sewers - Prevention and control – Sewage pumping-drainage in buildings - Plumbing systems for drainage

UNIT V SEWAGE TREATMENT AND DISPOSAL 12

Objectives - Selection of Treatment Methods - Principles, Functions, - Activated Sludge Process and Extended aeration systems - Trickling filters - Sequencing Batch Reactor(SBR) - UASB - Waste Stabilization Ponds - Other treatment methods - Reclamation and Reuse of sewage - Recent Advances in Sewage Treatment - Construction, Operation and Maintenance aspects. - Discharge standards-sludge treatment -Disposal of sludge

TOTAL: 60 PERIODS

COURSE OUTCOMES:

On completion of the course, the student is expected to

CO1 Understand the various components of water supply scheme and design of intake structure and conveyance system for water transmission

CO2 Understand on the characteristics and composition of sewage, ability to estimate sewage generation and design sewer system including sewage pumping stations

CO3 Understand the process of conventional treatment and design of water and wastewater treatment system and gain knowledge of selection of treatment process and biological treatment process

CO4 Ability to design and evaluate water distribution system and water supply in buildings and understand the self-purification of streams and sludge and septage disposal methods.

CO5 Able to understand and design the various advanced treatment system and knowledge about the recent advances in water and wastewater treatment process and reuse of sewage

R. Devi
Head of the Department
Department of Civil Engineering
Ponnaiyah Ramajayam Institute of
Science & Technology (Prist)
(Institution Deemed to be University
U/s 3 of the UGC Act 1956)
THANJAVUR - 613 403, TAMIL NADU

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

TEXTBOOKS:

1. Garg, S.K. Environmental Engineering, Vol.I Khanna Publishers, New Delhi, 2010.
2. Modi, P.N., Water Supply Engineering, Vol.I Standard Book House, New Delhi, 2016.
3. Garg, S.K., Environmental Engineering Vol.II, Khanna Publishers, New Delhi, 2015.
4. Duggal K.N., "Elements of Environmental Engineering" S. Chand and Co. Ltd., New Delhi, 2014.
5. Punmia, B.C., Jain, A.K., and Jain.A.K.., Environmental Engineering, Vol.II, Laxmi Publications, 2010.

REFERENCES:

1. Punmia B.C, Ashok Jain and Arun Jain, Water Supply Engineering, Laxmi Publications (P) Ltd., New Delhi 2010.
2. Manual on Water Supply and Treatment, CPHEEO, Ministry of Urban Development, Government of India, New Delhi, 1999.
3. Syed R. Qasimand Edward M. Motley Guang Zhu, Water Works Engineering Planning, Design and Operation, Prentice Hall of India Learning Private Limited, New Delhi, 2009.
4. Of Urban Development, Government of India, New Delhi, 2013.
5. Metcalf and Eddy – Waste water Engineering – Treatment and Reuse, Tata Mc. Graw – Hill Company, New Delhi, 2010.
6. Syed R.Qasim "Waste water Treatment Plants", CRCPress,WashingtonD.C.,2010
7. Gray N.F, "Water Technology", Elsevier India Pvt.Ltd. New Delhi, 2006.

COs- PO's & PSO's MAPPING

PO/PSO		Course Outcome					Overall Correlation of CO s to POs
		CO1	CO2	CO3	CO4	CO5	
PROGRAM OUTCOMES(PO)							
PO1	Knowledge of Engineering Sciences	2	2	3	3	3	3
PO2	Problem analysis	3	3	3	3	3	3
PO3	Design / development of solutions			3	3	3	3
PO4	Investigation	2	2			2	2
PO5	Modern Tool Usage				2	2	2
PO6	Engineer and Society			3	3	3	3
PO7	Environment and Sustainability			2	3	3	3
PO8	Ethics	1	1	2	2	2	2
PO9	Individual and Team work	1	1	2	3	3	2
PO10	Communication					2	2
PO11	Project Management and Finance			2	2	2	2
PO12	Life Long Learning					3	3
PROGRAM SPECIFIC OUTCOMES(PSO)							
PSO1	Knowledge of Civil Engineering discipline	3	3	3	3	3	3
PSO2	Critical analysis of Civil Engineering problems and innovation			2	2	2	2
PSO3	Conceptualization and evaluation of engineering solutions to Civil Engineering Issues			2	2	3	2

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Department of Civil Engineering
Ponnaiyah Ramajayam Institute of
Science & Technology (Prist)
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THANJAVUR - 613 403, TAMILNADU.

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

21155C36 SURVEYING AND LEVELLING L T P C
3 0 0 3

COURSE OBJECTIVES:

- To introduce the rudiments of plane surveying and geodetic principles to Civil Engineers and to learn the various methods of plane and geodetic surveying to solve the real world problems. To introduce the concepts of Control Surveying. To introduce the basics of Astronomical Surveying

UNIT I FUNDAMENTALS OF CONVENTIONAL SURVEYING 9

Definition – Classifications – Basic principles – Equipment and accessories for ranging and chaining – Methods of ranging – Well conditioned triangles – Chain traversing – Compass – Basic principles – Types – Bearing – System and conversions – Sources of errors and Local attraction – Magnetic declination – Dip – compass traversing – Plane table and its accessories – Merits and demerits – Radiation – Intersection – Resection – Plane table traversing.

UNIT II LEVELLING 9

Level line – Horizontal line – Datum – Benchmarks – Levels and staves – Temporary and permanent adjustments – Methods of leveling – Fly leveling – Check leveling – Procedure in leveling – Booking – Reduction – Curvature and refraction – Reciprocal leveling – Precise leveling - Contouring.

UNIT III THEODOLITE SURVEYING 9

Horizontal and vertical angle measurements – Temporary and permanent adjustments – Heights and distances – Tacheometric surveying – Stadia Tacheometry – Tangential Tacheometry – Trigonometric leveling – Single Plane method – Double Plane method.

UNIT IV CONTROL SURVEYING AND ADJUSTMENT 9

Horizontal and vertical control – Methods – Triangulation – Traversing – Gale's table – Trilateration – Concepts of measurements and errors – Error propagation and Linearization – Adjustment methods - Least square methods – Angles, lengths and levelling network.

UNIT V MODERN SURVEYING 9

Total Station: Digital Theodolite, EDM, Electronic field book – Advantages – Parts and accessories – Working principle – Observables – Errors - COGO functions – Field procedure and applications. GPS: Advantages – System components – Signal structure – Selective availability and antispoofing receiver components and antenna – Planning and data acquisition – Data processing – Errors in GPS – Field procedure and applications.

TOTAL 45 PERIODS

COURSE OUTCOMES:

On completion of the course, the student is expected to

CO1 Introduce the rudiments of various surveying and its principles.
CO2 Imparts knowledge in computation of levels of terrain and ground features
CO3 Imparts concepts of Theodolite Surveying for complex surveying operations
CO4 Understand the procedure for establishing horizontal and vertical control
CO5 Imparts the knowledge on modern surveying instruments

TEXTBOOKS:

1. Dr. B. C. Punmia, Ashok K. Jain and Arun K Jain, Surveying Vol. 1 & II, Lakshmi Publications Pvt Ltd, New Delhi, Sixteenth Edition, 2016.
2. T. P. Kanetkarand S. V. Kulkarni, Surveying and Levelling, Parts 1 & 2, Pune Vidyarthi Griha Prakashan, Pune, 2008.

Head of the Department
Department of Civil Engineering
Ponnaiyah Ramajayam Institute of
Science & Technology (Prist)
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THANJAVUR - 613 403, TAMILNADU.

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

REFERENCES:

1. R. Subramanian, Surveying and Levelling, Oxford University Press, Second Edition, 2012.
2. James M. Anderson and Edward M. Mikhail, Surveying, Theory and Practice, Seventh Edition, Mc Graw Hill 2001.
3. Bannister and S. Raymond, Surveying, Seventh Edition, Longman 2004.
4. S. K. Roy, Fundamentals of Surveying, Second Edition, Prentice Hall of India2010.
5. K. R. Arora, Surveying Vol I & II, Standard Book house, Twelfth Edition 2013.
6. C. Venkatramaiah, Textbook of Surveying, Universities Press, Second Edition, 2011.

COs- PO's & PSO's MAPPING

PO/PSO		Course Outcome					Overall Correlation of CO s to POs
		CO1	CO2	CO3	CO4	CO5	
PROGRAM OUTCOMES(PO)							
PO1	Knowledge of Engineering Sciences	2	3	3	3	3	3
PO2	Problem analysis	3	3	3	3	3	3
PO3	Design / development of solutions	3	2	3	3	3	3
PO4	Investigation	2	2	2	3	3	2
PO5	Modern Tool Usage	2	2	3	3	3	3
PO6	Engineer and Society	3	3	3	3	3	3
PO7	Environment and Sustainability				2	2	2
PO8	Ethics	2	2	2	2	3	2
PO9	Individual and Team work	2	2	2	3	2	2
PO10	Communication						
PO11	Project Management and Finance	2	2	2	2	2	2
PO12	Life Long Learning				2	2	2
PROGRAM SPECIFIC OUTCOMES(PSO)							
PSO1	Knowledge of Civil Engineering discipline	3	3	3	3	3	3
PSO2	Critical analysis of Civil Engineering problems and innovation	3	3	3	3	3	3
PSO3	Conceptualization and evaluation of engineering solutions to Civil Engineering Issues	3	3	3	3	3	3

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Department of Civil Engineering
Ponnaiyah Ramajayam Institute of
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21155L37 SURVEYING AND LEVELLING LABORATORY L T P C 0 0 3 1.5

COURSE OBJECTIVE:

- At the end of the course the student will possess knowledge about survey field techniques

LIST OF EXPERIMENTS:

Chain Survey

1. Study of chains and its accessories, Aligning, Ranging, Chaining and Marking Perpendicular offset
2. Setting out works – Foundation marking using tapes single Room and Double Room

Compass Survey

3. Compass Traversing – Measuring Bearings & arriving included angles

Levelling - Study of levels and levelling staff

4. Fly levelling using Dumpy level &Tilting level
5. Check levelling

Theodolite - Study of Theodolite

6. Measurements of horizontal angles by reiteration and repetition and vertical angles
7. Determination of elevation of an object using single plane method when base is Accessible/inaccessible.

Tacheometry – Tangential system – Stadia system

8. Determination of Tacheometric Constants
9. Heights and distances by stadia Tacheometry
10. Heights and distances by Tangential Tacheometry

Total Station - Study of Total Station, Measuring Horizontal and vertical angles

11. Traverse using Total station and Area of Traverse
12. Determination of distance and difference in elevation between two inaccessible points using Total station

TOTAL: 45 PERIODS

COURSE OUTCOMES

On completion of the course, the student is expected to

CO1 Impart knowledge on the usage of basic surveying instruments like chain/tape, compass and levelling instruments

CO2 Able to use levelling instrument for surveying operations

CO3 Able to use theodolite for various surveying operations

CO4 Able to carry out necessary surveys for social infrastructures

CO5 Able to prepare planimetric maps

REFERENCES:

1. T. P. Kanetkarand S. V. Kulkarni, Surveying and Levelling, Parts 1 & 2, Pune Vidyarthi Griha Prakashan, Pune, 24th Reprint, 2015.
2. Dr. B. C. Punmia, Ashok K. Jainand Arun K Jain, Surveying Vol. I & II, Lakshmi Publications Pvt Ltd, New Delhi, 17th Edition, 2016.
3. James M. Anderson and Edward M. Mikhail, Surveying, Theory and Practice, Seventh Edition, McGraw Hill 2001
4. Bannisterand S. Raymond, Surveying, Seventh Edition. Longman 2004 a. David Clark, Plane and Geodetic Surveying for Engineers, Volume I, Constable and Company Ltd, London, CBS, 6th Edition, 2004.
5. David Clark and James Clendinning, Plane and Geodetic Surveying for Engineers, VolumeII, Constable and Company Ltd, London, CBS, 6th Edition, 2004.

Head of the Department
Department of Civil Engineering
Ponnaiyah Ramajayam Institute of
Science & Technology (Prist)
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DEAN
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Science and Technology (PRIST)
Deemed to be University
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6. S. K. Roy, Fundamentals of Surveying, Second Edition, Prentice 'Hall of India 2004
7. K. R. Arora, Surveying Vol. I & II, Standard Book house, Eleventh Edition, 2013.

COs- PO's & PSO's MAPPING

PO/PSO		Course Outcome					Overall Correlation of CO s to POs
		CO1	CO2	CO3	CO4	CO5	
PROGRAM OUTCOMES(PO)							
PO1	Knowledge of Engineering Sciences	3	3	3	3	3	3
PO2	Problem analysis	2	2	1	3	3	2
PO3	Design / development of solutions	3	3	2	2	3	3
PO4	Investigation	3			3	2	3
PO5	Modern Tool Usage	2	3	3	2	2	3
PO6	Engineer and Society	3	3	2	3	3	3
PO7	Environment and Sustainability	2	3		3	3	3
PO8	Ethics	3	3		2	2	3
PO9	Individual and Team work	3	3	3	3	3	3
PO10	Communication	3	3		3	3	3
PO11	Project Management and Finance	3	3		3	3	3
PO12	Life Long Learning	1	1	2	1	1	1
PROGRAM SPECIFIC OUTCOMES(PSO)							
PSO1	Knowledge of Civil Engineering discipline	3	3	3	3	3	3
PSO2	Critical analysis of Civil Engineering problems and innovation	3	3	3	3	3	3
PSO3	Conceptualization and evaluation of engineering solutions to Civil Engineering Issues	3	3	3	3	3	3

R. Devi.
Head of the Department
Department of Civil Engineering
Ponnaiyah Ramajayam Institute of
Science & Technology (Prist)
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Science and Technology (PRIST)
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21155L39 **PROFESSIONAL DEVELOPMENT** L T P C
0 0 2 1

COURSE OBJECTIVES:

- To be proficient in important Microsoft Office tools: MS WORD, EXCEL, POWERPOINT.
- To be proficient in using MS WORD to create quality technical documents, by using standard templates, widely acceptable styles and formats, variety of features to enhance the presentability and overall utility value of content.
- To be proficient in using MS EXCEL for all data manipulation tasks including the common statistical, logical, mathematical etc., operations, conversion, analytics, search and explore, visualize,interlink, and utilizing many more critical features offered
- To be able to create and share quality presentations by using the features of MS PowerPoint, including: organization of content, presentability, aesthetics, using media elements and enhance the overall quality of presentations.

MS WORD: 10 Hours

Create and format a document
Working with tables
Working with Bullets and Lists
Working with styles, shapes, smart art, charts
Inserting objects, charts and importing objects from other office tools
Creating and Using document templates
Inserting equations, symbols and special characters
Working with Table of contents and References, citations
Insert and review comments
Create bookmarks, hyperlinks, endnotes footnote
Viewing document in different modes
Working with document protection and security
Inspect document for accessibility

MS EXCEL: 10 Hours

Create worksheets, insert and format data
Work with different types of data: text, currency, date, numeric etc.
Split, validate, consolidate, Convert data
Sort and filter data
Perform calculations and use functions: (Statistical, Logical, Mathematical, date, Time etc.,)
Work with Lookup and reference formulae
Create and Work with different types of charts
Use pivot tables to summarize and analyse data
Perform data analysis using own formulae and functions
Combine data from multiple worksheets using own formulae and built-in functions to generate results
Export data and sheets to other file formats
Working with macros
Protecting data and Securing the workbook

MS POWERPOINT: 10 Hours

Select slide templates, layout and themes
Formatting slide content and using bullets and numbering

Head of the Department
Department of Civil Engineering
Ponnaiyah Ramajayam Institute of
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THANJAVUR - 613 403, TAMILNADU.

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

Insert and format images, smart art, tables, charts
Using Slide master, notes and handout master
Working with animation and transitions
Organize and Group slides
Import or create and use media objects: audio, video, animation
Perform slideshow recording and Record narration and create presentable videos

TOTAL: 30 PERIODS

COURSE OUTCOMES:

On successful completion the students will be able to

CO1 Use MS Word to create quality documents, by structuring and organizing content for their day to day technical and academic requirements

CO2 Use MS EXCEL to perform data operations and analytics, record, retrieve data as per requirements and visualize data for ease of understanding

CO3 Use MS PowerPoint to create high quality academic presentations by including common tables, charts, graphs, interlinking other elements, and using media objects.

Head of the Department
Department of Civil Engineering
Ponnaiyah Ramajayam Institute of
Science & Technology (Prist)
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Science and Technology (PRIST)
Deemed to be University
Vallam, Thanjavur - 613 403.

21155C45 HIGHWAY AND RAILWAY ENGINEERING L T P C
3 0 0 3

COURSE OBJECTIVE:

- To give an overview about the highway and railway engineering with respect to, planning, design, construction and maintenance as per IRC standards, specifications and methods.

UNIT I HIGHWAY ENGINEERING 9

Classification of highways – Institutions for Highway planning, design and construction at different levels – factors influencing highway alignment –Typical cross sections of Urban and Rural roads – Engineering surveys for alignment- Conventional and Modern method

UNITII DESIGN OF HIGHWAY ELEMENTS 9

Cross sectional elements – Horizontal curves, super elevation, transition curves, widening of curves – Sight distances – Vertical curves, gradients– pavement components and their role - Design practice for flexible and rigid pavements (IRC methods only).

UNIT III HIGHWAY CONSTRUCTION AND MAINTENANCE 9

Highway construction materials, properties, testing methods – Construction practice of flexible and concrete pavement- Highway drainage – Evaluation and Maintenance of pavements.

UNIT IV RAILWAY PLANNING AND CONSTRUCTION 9

Elements of permanent way – Rails, Sleepers, Ballast, rail fixtures and fastenings, Selection of gauges - Track Stress, coning of wheels, creep in rails, defects in rails – Route alignment surveys, conventional and modern methods-Geometric design of railway, gradient, super elevation, widening of gauge on curves (Problems)-Railway drainage- Level Crossings-Signalling.

UNIT V RAILWAY TRACK CONSTRUCTION MAINTENANCE AND OPERATION 9

Points and Crossings - Design of Turnouts, Working Principle-Track Circuiting - Construction & Maintenance – Conventional, Modern methods and Materials, Lay outs of Railway Stations and Yards, Rolling Stock, Tractive Power, Track Resistance - Role of Indian Railways in National Development – Railways for Urban Transportation – LRT & MRTS Feasibility study, Planning and construction.

TOTAL: 45 PERIODS

COURSE OUTCOMES

On completion of the course, the student is expected to

CO1 Plan a highway according to the principles and standards adopted in various institutions in India.

CO2 Design the geometric features of road network and components of pavement.

CO3 Test the highway materials and construction practice methods and know its properties and able to perform pavement evaluation and management.

CO4 Understand the methods of route alignment and design elements in railway planning and constructions.

CO5 Understand the construction techniques and maintenance of track laying and railway stations

TEXTBOOKS:

1. Khanna.S. K., Justo.C.E.G and Veeraragavan A. "Highway Engineering", Nemchand Publishers, 2014.

2. Subramanian K.P., "Highways, Railways, Airport and Harbour Engineering", Scitech Publications (India), Chennai,2010

3. Kadiyali.L.R. "Principles and Practice of Highway Engineering", Khanna Technical Publications, 6th edition Delhi, 2015.

Head of the Department
Department of Civil Engineering
Ponnaiyah Ramajayam Institute of
Science & Technology (Prist)
(Institution Deemed to be University
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Science and Technology (PRIST)
Deemed to be University
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4. C. Venkatramaiah., Transportation Engineering-Vol.2 Railways, Airports, Docks and Harbours, Bridges and Tunnels., Universities Press (India) Private Limited, Hyderabad, 2015.

REFERENCES:

1. Indian Road Congress (IRC). Guidelines for the Design of Flexible Pavements, (Third Revision). IRC:37-2012
2. Indian Road Congress (IRC), Guidelines for the Design of Plain Jointed Rigid Pavements for Highways, (Third Revision), IRC:58-2012
3. Yang H. Huang, "Pavement Analysis and Design", Pearson Education Inc, Nineth Impression, South Asia,2012
4. Ian D. Walsh, "ICE manual of highway design and management", ICE Publishers, Ist Edition, USA,2011
5. Fred L. Mannering, Scott S. Washburn and Walter P.Kilareski, "Principles of Highway Engineering and Traffic Analysis", Wiley India Pvt. Ltd., New Delhi, 2011
6. Garber and Hoel, "Principles of Traffic and Highway Engineering", CENGAGE Learning, New Delhi,2010
7. O'Flaherty.C.A "Highways, Butterworth – Heinemann, Oxford,2006
8. IRC-37--2012,The Indian roads Congress, Guidelines for the Design of Flexible Pavements, NewDelhi

COs- PO's & PSO's MAPPING

PO/PSO		Course Outcome					Overall Correlation of CO s to POs
		CO1	CO2	CO3	CO4	CO5	
PROGRAM OUTCOMES(PO)							
PO1	Knowledge of Engineering Sciences	3	2	2	3		2
PO2	Problem analysis		3	3			3
PO3	Design / development of solutions		3	2		3	3
PO4	Investigation	2	2	2			2
PO5	Modern Tool Usage		2	2		2	2
PO6	Engineer and Society	3		3	3		3
PO7	Environment and Sustainability	1	2	3			2
PO8	Ethics	3	3	3	3		3
PO9	Individual and Team work		2			2	2
PO10	Communication				1		1
PO11	Project Management and Finance		2	3			3
PO12	Life Long Learning		3	3		2	3
PROGRAM SPECIFIC OUTCOMES(PSO)							
PSO1	Knowledge of Civil Engineering discipline	3	3	3	3	3	3
PSO2	Critical analysis of Civil Engineering problems and innovation	2	3	3	2	3	3
PSO3	Conceptualization and evaluation of engineering solutions to Civil Engineering Issues				2	3	2

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21155L48 MATERIALS TESTING LABORATORY L T P C
0 0 4 2

COURSE OBJECTIVES:

- To develop skills to test various construction materials.

I. TESTS ON METALS

a. Tension test on steel rod
b. Torsion test on mild steel rod
c. Deflection test on metal beam
d. Double shear test on metal
e. Impact test on metal specimen (Izod and Charpy)
f. Hardness test on metals (Rockwell and Brinell Hardness Tests)
g. Compression test on helical spring
h. Deflection test on carriage spring

II. TESTS ON CEMENT

a. Determination of fineness of cement
b. Determination of consistency of cement
c. Determination of specific gravity of cement
d. Determination of initial and final setting time of cement

III. TESTS ON FINE AGGREGATE

a. Determination of specific gravity and water absorption of fine aggregate
b. Determination of grading of fine aggregate
c. Determination of water absorption for fine aggregate

IV. TESTS ON COARSE AGGREGATE

a. Determination of compacted and loose bulk density of coarse aggregate
b. Determination of impact value of coarse aggregate
c. Determination of elongation index of coarse aggregate
d. Determination of flakiness index of coarse aggregate
e. Determination of aggregate crushing value of coarse aggregate
f. Determination of specific gravity and water absorption of coarse aggregate

V. TESTS ON BRICKS

a. Determination of compressive strength of bricks
b. Determination of water absorption of bricks
c. Determination of efflorescence of bricks

VI. TESTS ON CONCRETE

a. Determination of slump of concrete
b. Determination of compressive strength of concrete
c. Determination of flowability of self-compacting concrete (Demo only)

VII. TEST ON WOOD

a. Determination of Compression test on wood

TOTAL: 60 PERIODS

COURSE OUTCOMES:

On completion of the course, the student is expected to

CO1 Determine the mechanical properties of steel.
CO2 Determine the physical properties of cement
CO3 Determine the physical properties of fine and coarse aggregate.

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CO4 Determine the workability and compressive strength of concrete.
CO5 Determine the strength of brick and wood.

COs- PO's & PSO's MAPPING

PO/PSO		Course Outcome					Overall Correlation of COs to POs
		CO1	CO2	CO3	CO4	CO5	
PO1	Knowledge of Engineering Sciences	2	3	3	3	3	3
PO2	Problem analysis	2	2	3	3	3	3
PO3	Design / development of solutions	1	1	2	2	2	2
PO4	Investigation	3	3	3	3	3	3
PO5	Modern Tool Usage	1	1	1	1	2	1
PO6	Engineer and Society	2	2	2	2	2	2
PO7	Environment and Sustainability	2	2	2	2	2	2
PO8	Ethics	1	1	1	1	1	1
PO9	Individual and Team work	3	3	3	3	3	3
PO10	Communication	1	1	1	1	1	1
PO11	Project Management and Finance	1	1	1	1	1	1
PO12	Life Long Learning	2	2	2	2	2	2
PROGRAM SPECIFIC OUTCOMES(PSO)							
PSO1	Knowledge of Civil Engineering discipline	2	3	3	3	3	3
PSO2	Critical analysis of Civil Engineering problems and innovation	2	2	2	2	2	2
PSO3	Conceptualization and evaluation of engineering solutions to Civil Engineering Issues	2	2	2	2	2	2

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21155C64 HYDROLOGY AND WATER RESOURCE ENGINEERING L T P C
3 0 0 3

OBJECTIVE:

To introduce the student to the concept of hydrological aspects of water availability and requirements and should be able to quantify, control and regulate the water resources.

UNIT I PRECIPITATION AND ABSTRACTIONS 10

Hydrological cycle- Meteorological measurements – Requirements, types and forms of precipitation - Rain gauges-Spatial analysis of rainfall data using Thiessen and Isohyetal methods-Interception - Evaporation. Horton"s equation. pan evaporation measurements and evaporation suppression - Infiltration-Horton"s equation - double ring infiltrometer, infiltration indices.

UNIT II RUNOFF 8

Watershed, catchment and basin - Catchment characteristics - factors affecting runoff - Run off estimation using empirical - Strange"s table and SCS methods – Stage discharge relationshipsflow measurements- Hydrograph – Unit Hydrograph – IUH

UNIT III FLOOD AND DROUGHT 9

Natural Disasters-Flood Estimation- Frequency analysis- Flood control- Definitions of droughts-Meteorological, hydrological and agricultural droughts- IMD method-NDVI analysisDrought Prone Area Programme (DPAP)

UNIT IV RESERVOIRS 8

Classification of reservoirs, General principles of design, site selection, spillways, elevation – area - capacity - storage estimation, sedimentation - life of reservoirs – rule curve

UNIT V GROUNDWATER AND MANAGEMENT 10

Origin- Classification and types - properties of aquifers- governing equations – steady and unsteady flow - artificial recharge - RWH in rural and urban areas

TOTAL : 45 PERIODS

OUTCOMES:

The students completing the course will have an understanding of the key drivers on water resources. hydrological processes and their integrated behaviour in catchments, ability to construct and apply a range of hydrological models to surface water and groundwater problems including Hydrograph, Flood/Drought management, artificial rechargeability to conduct Spatial analysis of rainfall data and design water storage reservoirs Understand the concept and methods of ground water management.

TEXTBOOKS:

1. Subramanya .K. "Engineering Hydrology"- Tata McGraw Hill, 2010 2. Jayarami Reddy .P. "Hydrology", Tata McGraw Hill, 2008. Linsley, R.K. and Franzini, J.B. "Water Resources Engineering", McGraw Hill International Book Company, 1995. REFERENCES: 1. David Keith Todd. "Groundwater Hydrology", John Wiley & Sons, Inc. 2007 Ven Te Chow, Maidment, D.R. and Mays, L.W. "Applied Hydrology", McGraw Hill International Book Company, 1998. Raghunath .H.M., "Hydrology", Wiley Eastern Ltd., 1998

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21155L69 **BUILDING DRAWING AND DETAILING LABORATORY** L T P C
0 0 4 2

COURSE OBJECTIVE:

- To impart knowledge and skill relevant to Building drawing and Detailing lab using computer software

LIST OF EXPERIMENTS

1. Principles of planning and orientation
2. Buildings with load bearing walls and RCC roof (Plan , section , elevation)
3. Buildings with sloping roof
4. Buildings with Framed structures.
5. Building information modeling.
6. Reinforcement details of RCC structural elements (slab, beam and column)
7. Reinforcement details of footings (Isolated, stepped, combined footing)
8. Steel structures (Steel Connections detailing, beam to column connection, beam to beam connection – bolt & Weld, Roof truss & purlin)

TOTAL : 60 PERIODS

REFERENCES:

1. V.B.Sikka, "A course in Civil Engineering Drawing" S.K.Kataria & Sons Publishers, Seventh Edition, 2015.
2. D.N.Ghose, "Civil Engineering Drawing and Design" CBS Publishers & Distributors Pvt.Ltd., 2nd Edition, 2010.
3. National Building Code of India 2016 (NBC 2016)
4. Unnikrishna Pillai and Devdas Menon, Reinforced Concrete Design (Third Edition), Tata Mc Graw Hill Publishing Company Ltd., New Delhi, 3rd Edition, 2017.
5. Subramanian N, Design of Steel Structures, Oxford University Press, New Delhi, 2016

COURSE OUTCOME

- On completion of the course, the student is expected to be able to

CO1 Draft the plan, elevation and sectional view of the load bearing and framed buildings
CO2 Draw the structural detailing of RCC elements
CO3 Draw the structural detailing of RCC water tanks, footings and retaining walls
CO4 Draw the structural detailing of steel structures
CO5 Draft the structural detailing of Industrial structures

COs- PO's & PSO's MAPPING

PO/PSO		Course Outcome					Overall Correlation of CO s to POs
		CO1	CO2	CO3	CO4	CO5	
PROGRAM OUTCOMES(PO)							
PO1	Knowledge of Engineering Sciences	3	3	3	3	3	3
PO2	Problem analysis	-	2	2	2	2	2
PO3	Design / development of solutions	-	-	-	-	-	-
PO4	Investigation	-	-		2	2	2
PO5	Modern Tool Usage	2	2	2	2	2	2
PO6	Engineer and Society	-	3	3	3	3	3
PO7	Environment and Sustainability	-	-	-	-	-	-

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PO8	Ethics	1	2	2	1	2	2
PO9	Individual and Team work	-	3	3	3	3	3
PO10	Communication	-	2	2	2	2	2
PO11	Project Management and Finance	-	-	-	-	-	-
PO12	Life Long Learning	1	2	2	2	2	2
PROGRAM SPECIFIC OUTCOMES(PSO)							
PSO1	Knowledge of Civil Engineering discipline	3	3	3	3	3	3
PSO2	Critical analysis of Civil Engineering problems and innovation	2	2	2	2	2	2
PSO3	Conceptualization and evaluation of engineering solutions to Civil Engineering Issues	-	2	2	2	2	2

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21147S71 HUMAN VALUES AND ETHICS

UNIT I HUMAN VALUES 8

Morals- Values and Ethics – Integrity – Work Ethic – Service Learning – Civic Virtue – Respect for Others – Living Peacefully – caring – Sharing – Honesty – Courage – Valuing Time – Co-operation – Commitment – Empathy – Self-Confidence – Character – Spirituality

UNIT II ENGINEERING ETHICS 9

Senses of 'Engineering Ethics' - variety of moral issued - types of inquiry - moral dilemmas - moral autonomy - Kohlberg's theory - Gilligan's theory - consensus and controversy – Models of Professional Roles - theories about right action - Self-interest - customs and religion - uses of ethical theories

UNIT III ENGINEERING AS SOCIAL EXPERIMENTATION 9

Engineering as experimentation - engineers as responsible experimenters - codes of ethics –industrial standards- a balanced outlook on law - the challenger case study

UNIT IV SAFETY- RESPONSIBILITIES AND RIGHTS 10

Safety and risk - assessment of safety and risk - risk benefit analysis and reducing risk - the three mile island and chernobyl case studies- Collegiality and loyalty - respect for authority - collective bargaining - confidentiality - conflicts of interest - occupational crime - professional rights - employee rights - Intellectual Property Rights (IPR) - discrimination

UNIT V GLOBAL ISSUES 9

Multinational corporations - Environmental ethics - computer ethics - weapons development - engineers as managers-consulting engineers-engineers as expert witnesses and advisors -moral leadership-sample code of Ethics like ASME- ASCE- I-EE-E- Institution of Engineers (IEI) India- Institution of Electronics and Telecommunication engineers(IETE) India- etc

TUTORIAL : 15

TOTAL: 60 PERIODS

REFERENCES :

1. Mike Martin and Roland Schinzinger- "Ethics in Engineering"- Tata McGraw-Hill- - 1996-3 e.
2. Govindarajan M- Natarajan S- Senthil Kumar V- S- "Engineering Ethics"- Prentice Hall of India- New Delhi- 2004.
3. R-S Nagarazan -"A textbook on Professional Ethics and Human Values" New Age International Publishers- New Delhi 2006.
4. Charles D- Fleddermann- "Engineering Ethics"- Pearson Education / Prentice Hall- New Jersey- 2004 (Indian Reprint).
5. Charles E Harris- Michael S- Protchard and Michael J Rabins- "Engineering Ethics – Concepts and Cases"- Wadsworth Thompson Learning- United States- 2000 (Indian Reprint now available).
6. John R Boatright- "Ethics and the Conduct of Business"- Pearson Education- New Delhi- 2003.

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21160S77 **TOTAL QUALITY MANAGEMENT** L T P C
3 0 0 3

COURSE OBJECTIVES:

- Teach the need for quality, its evolution, basic concepts, contribution of quality gurus, TQM framework, Barriers and Benefits of TQM.
- Explain the TQM Principles for application.
- Define the basics of Six Sigma and apply Traditional tools, New tools, Benchmarking and FMEA.
- Describe Taguchi's Quality Loss Function, Performance Measures and apply Techniques like QFD, TPM, COQ and BPR.
- Illustrate and apply QMS and EMS in any organization.

UNIT I INTRODUCTION 9

Introduction - Need for quality - Evolution of quality - Definition of quality - Dimensions of product and service quality –Definition of TQM-- Basic concepts of TQM - Gurus of TQM (Brief introduction) -- TQM Framework- Barriers to TQM –Benefits of TQM.

UNIT II TQM PRINCIPLES 9

Leadership - Deming Philosophy, Quality Council, Quality statements and Strategic planning- Customer Satisfaction –Customer Perception of Quality, Feedback, Customer complaints, Service Quality, Kano Model and Customer retention – Employee involvement – Motivation, Empowerment, Team and Teamwork, Recognition & Reward and Performance Appraisal-- Continuous process improvement –Juran Trilogy, PDSA cycle, 5S and Kaizen - Supplier partnership – Partnering, Supplier selection, Supplier Rating and Relationship development.

UNIT III TQM TOOLS & TECHNIQUES I 9

The seven traditional tools of quality - New management tools - Six-sigma Process Capability- Bench marking - Reasons to benchmark, Benchmarking process, What to Bench Mark, Understanding Current Performance, Planning, Studying Others, Learning from the data, Using the findings, Pitfalls and Criticisms of Benchmarking - FMEA - Intent , Documentation, Stages: Design FMEA and Process FMEA.

UNIT IV TQM TOOLS & TECHNIQUES II 9

Quality circles – Quality Function Deployment (QFD) - Taguchi quality loss function – TPM – Concepts, improvement needs – Performance measures- Cost of Quality - BPR.

UNIT V QUALITY MANAGEMENT SYSTEM 9

Introduction-Benefits of ISO Registration-ISO 9000 Series of Standards-Sector-Specific Standards - AS 9100, TS16949 and TL 9000-- ISO 9001 Requirements-Implementation-Documentation-Internal Audits-Registration-ENVIRONMENTAL MANAGEMENT SYSTEM: Introduction—ISO 14000 Series Standards—Concepts of ISO 14001—Requirements of ISO 14001-Benefits of EMS.

TOTAL: 45 PERIODS

COURSE OUTCOMES:

CO1: Ability to apply TQM concepts in a selected enterprise.
CO2: Ability to apply TQM principles in a selected enterprise.
CO3: Ability to understand Six Sigma and apply Traditional tools, New tools, Benchmarking and FMEA.
CO4: Ability to understand Taguchi's Quality Loss Function, Performance Measures and apply QFD, TPM, COQ and BPR.
CO5: Ability to apply QMS and EMS in any organization.

TEXT BOOK:

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1. Dale H.Besterfiled, Carol B.Michna,Glen H. Besterfield,Mary B.Sacre,Hemant Urdhwareshe and RashmiUrdhwareshe, "Total Quality Management", Pearson Education Asia, Revised Third Edition, Indian Reprint, Sixth Impression,2013.

REFERENCES:

1. Joel.E. Ross, "Total Quality Management – Text and Cases", Routledge.,2017.
2. Kiran.D.R, "Total Quality Management: Key concepts and case studies, Butterworth – Heinemann Ltd, 2016.
3. Oakland, J.S. "TQM – Text with Cases", Butterworth – Heinemann Ltd., Oxford, Third Edition, 2003.
4. Suganthi,L and Anand Samuel, "Total Quality Management", Prentice Hall (India) Pvt. Ltd., 2006

CO's- PO's & PSO's MAPPING

CO	PO												PSO		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1		3										3	2		3
2						3						3		2	
3					3				3					2	3
4		2			3	2	3	2				3	3	2	
5			3			3	3	2							
AVg.		2.5	3		3	2.6	3	2	3			3	2.5	2	3

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ANNEXURE II
VALUE ADDED COURSES

NAVISWORKS

S.No	Topics	Minimum
1.	Introduction to Navis Works.	5hrs
2.	Model Import and Integration. Files and File Types.	5hrs
3.	Moving Around the Model.	5hrs
4.	Model Review and Visualisation. Climbing the selection tree.	5hrs
5.	Clash Detection and Resolution.	5hrs
6.	Quantification and Takeoff.	5hrs
7.	Time Liner and 4D Simulation.	5hrs
8.	Model Snapshots.	5hrs
9.	Viewpoints, Animations, and Sections.	5hrs

Duration of the Course: 45 hours.

Learning outcomes:

1. Integrating multiple design models ensures all systems work seamlessly.
2. Identifying and resolving conflicts between different systems early in the design process to avoid costly rework.
3. This software allows linking 3D models with time-related data, improving project planning and management.

PRIMAVERA

S.No	Topics	Minimum
1.	Introduction to PRIMAVERA.	5hrs
2.	Opening a Project.	5hrs
3.	Introduction to Calendar.	5hrs
4.	Work Breakdown Structure.	5hrs
5.	Creating Activities.	5hrs
6.	Task Relationships.	5hrs
7.	Scheduling.	5hrs
8.	Constraints.	5hrs
9.	Resources.	5hrs

Duration of the Course: 45 hours.

Learning outcomes:

1. Apply advanced resource management techniques to optimize resource allocation and utilization.
2. They are related to, but different from, teaching aims, which instead describe broadly what the session or course is about and its overall purpose.
3. Understanding of how to plan and schedule. Learn To: Create and schedule a project. Assign resources.

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4. Implement effective risk management strategies, identifying and mitigating potential project risks proactively.

BIM

S.No	Topics	Minimum
1	Revit Interface	5hrs
2	Walls, Curtain Walls, Windows and Doors	5hrs
3	Floors, Roofs and Ceilings	5hrs
4	Stairs, Railings and Ramps	5hrs
5	Adding - Modifying Families	5hrs
6	Massing - Conceptual Mass	5hrs
7	Model In-Place	5hrs
8	Schematic Design and Room & Color Fill Plans	5hrs
9	Materials, Visualization and Rendering	5hrs
10	Details and Annotations	5hrs
11	Schedules and Project Phasing	5hrs
12	Drawing Sets and Construction Documents	5hrs

Duration of the Course: 60 hours

Learning outcomes:

1. Understand the role and potential of BIM for the industry
2. Use of BIM in Building projects and provide the right level of detail.
3. Capable of advanced object use in BIM context through interactive editors and object libraries
4. Identify, describe and apply adequate modelling practices in view of intended uses for the models.
5. Capability of in-depth application of BIM in specific contexts of building rehabilitation and sustainabili analysis/assessment.

3Ds Max

S.NO	TOPICS	MINIMUM
1	Introduction to 3DS Max	2 HRS
2	Modeling in 3DS Max	5 HRS
3	Introduction to Animation	3 HRS
4	Animation Principles	5 HRS
5	Introduction to the Materials, Interiors and Furniture	5 HRS
6	Textures and UV Workflows	5 HRS
7	Introduction to Lighting: Interior Lighting	5 HRS
8	3DS Max Rendering	5 HRS
9	Mental Ray	5 HRS

Duration of the Course: 40 hours
Learning outcomes:

1. Model objects using a variety of techniques.

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2. Design and apply materials.
3. Build and animate simple, effective environments.
4. To enhance the computing skills of the students.

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