

REGULATION

2019



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

INDEX

REGULATION - 2019

S.NO.	DEPARTMENT	PAGE NO.
1.	Education	2
2.	ECE	29
3.	Mechanical	151
4.	CSE	260
5.	Biotechnology	379
6.	EEE	444
7.	Commerce	522
8.	Management	633

1.1.1 Curricula developed and implemented have relevance to the local, national, regional and global development needs which is reflected in programme outcomes (POs) and course outcomes (Cos) of the programme by the university 19UGEDUGE and 19PGEDUGE

SCHOOL OF EDUCATION

DEPARTMENT OF EDUCATION

2019 REGULATION

Local need	Yellow
Regional need	Red
National need	Green
Global need	Blue



SCHOOL OF EDUCATION
2019 REGULATION B.Ed.,
1.1.1 CO-PO-PSO Mapping of Curriculum

Sem	Course code	Course title	CO's	PO's						
				PO1	PO2	PO3	PO4	PO5	PO6	PO7
I	19130 PE11	Psychology of Learners and Learning – I	Acquire knowledge about the approaches to educational psychology		*			*		*
			Comprehend the concepts growth and development and various theories of growth and development.	*			*			
			Know about learning and memory.	*	*				*	
			Describe the concept of philosophy and education and understand the knowledge of Eastern and Western schools of philosophy.	*	*				*	
I	19130 PE12	Education in Contemporary – I	Describe the concept of philosophy and education and understand the knowledge of Eastern and Western schools of philosophy.		*		*			*
			Explore the educational thoughts of great thinkers and understand the issues and challenges in Indian Society and educational solutions.	*	*			*		
			Understand the constitutional provisions for education and identify the ways and means for including values.	*			*			*

19130 PE13	Education and socialization-I	Comprehend the interface between society and school.	*	*			*		
		Familiar with the emergence of 'person' and Identity.		*		*		*	
		Experience empirically with various determinants of Identification		*		*		*	
		Learn the process of socialization	*		*			*	*
19130 CP14 A	Pedagogy Of Tamil: Part – I	Realize the value of Tamil.	*		*		*	*	
		Understand the quality of Tamil	*		*		*		*
		Understand the micro teaching skills and to practice in their carrier.	*			*		*	
19130 CP14 B	Pedagogy Of English: Part – I	Realize the value of English	*		*		*		*
		Understand the quality of English.		*		*		*	*
		Understand the micro teaching skills and to practice in their carrier.	*		*		*		
		Understand the evaluation techniques		*		*		*	
19130 CP14 C	Pedagogy Of Mathematics: Part - I	Understand the school content and nature and scope of Mathematics	*		*		*		*
		Comprehend the aims and objectives of teaching Mathematics.		*		*		*	
		Explore in teaching and learning Mathematics.	*		*		*		
		Develop ability to construct school Mathematics.		*			*		*

19130 CP14 D	Pedagogy of Physical Science: Part - I	Acquire the knowledge about the objectives in teaching physical science	*	*				*	*
		Understand the core of science	*	*		*		*	
		Relate physical science to everyday life	*		*		*		*
		Understanding the objective of teaching physical science at various levels.	*		*		*		*
19130 CP14 E	Pedagogy of Biological Science: Part - I	Become self made professional teachers.	*			*		*	
		Understand psychological foundations of education and learning theories		*		*		*	
		Keep themselves abreast of latest trends and issues in secondary education	*		*			*	*
		Reduce the gap between theory and practice ie., Teacher-education curriculum and school realities.		*		*		*	
19130 CP14 F	Pedagogy of Social Science: Part - I	Understand the nature and importance of Social science.	*		*		*		*
		Acquire knowledge in lesson plan, Unit plan and resource plan.	*		*		*		*
		Comprehend the aims and objectives of teaching social science.		*		*		*	
19130 CP14 G	Pedagogy of Commerce and Accountancy : Part - I	Review Commerce and Accountancy syllabus.	*		*			*	
		Learn the significance of professional development of a commerce teacher.	*		*		*		*

			Create proper learning atmosphere in the classroom.		*			*			
19130 CP14 H	Pedagogy of Computer Science: Part - I	Acquire knowledge about methods of teaching computer science		*		*		*			*
		Understand the various skills in Microteaching		*		*		*			*
		Gain knowledge about planning for teaching – learning of computer science.		*		*		*			*
19130 CP14I	Pedagogy of Economics: Part - I	Understand the meaning and nature of Economics.		*	*		*		*		
		Develop knowledge on various strategies in teaching and learning Economics.		*	*		*		*		*
		To acquire knowledge on various concepts of Economics		*	*		*		*		
		Develop interest on the aim and objectives of teaching and learning Economics.			*	*			*		*
19130 CP14J	Pedagogy of History: Part - I	Acquire knowledge about the school history text books from VI to XII;		*		*		*			*
		Understand the aims and objectives of teaching History		*		*		*	*		
		Develop effective teaching skills		*		*		*			*
		Adopt the different teaching-learning strategies		*	*		*		*		
		Understand the steps involved in lesson planning		*		*		*	*		

19130 CP14 K	Pedagogy of Geography: Part - I	Get sensitized to the school content in Geography	*	*		*			*
		Comprehend the aims and objectives of teaching Geography	*	*		*		*	
		Acquire various teaching skills	*	*		*		*	
		Develop competence in structuring lesson plans	*		*		*		*
		Explore the methods and techniques of teaching Geography	*	*				*	
19130 AL15	Assessment of Learning	Understand the basic concepts of Test, Assessment and Evaluation	*			*		*	
		Acquire the knowledge of commonly used Tests in schools	*		*	*		*	
		Understand the purpose of Diagnostic Test	*		*			*	
		Develop Teaching Competency Assessment Scale			*	*		*	
19130 EP16 A	Yoga, Health and Physical Education	Define the concept of Yoga	*			*			*
		Classify the saunas and Pranayama	*		*		*		*
		Comprehend the aims and objectives of Health Education	*			*		*	
		Appreciate the important of food and nutrition.	*		*			*	
		Understand the meaning and significance of Pranayama, mural, kraits and meditation	*			*		*	*

19130 EP16 B	Guidance and Counseling	Describe the different services in the school guidance programme	*		*		*		*
		Understand the various therapies in counseling	*		*		*		*
		Acquire the skills necessary to administer and interpret standardized tools	*	*			*		*
19130 PE21	Psychology of Learners and Learning – II	Learn the concepts and theories of personality.	*		*		*		*
		Understand in –depth the concepts of intelligence and creativity		*		*		*	
		Identify the various adjustment mechanisms	*		*			*	
		Understand the types of guidance and counseling programme	*		*			*	
19130 PE22	Education in Contemporary – II	Describe the concept of philosophy and education and understand the knowledge of Eastern and Western schools of philosophy	*			*			
		Explore the educational thoughts of great thinkers and understand the issues and challenges in Indian Society and educational solutions.	*		*		*	*	

II	19130 PE23	Education and socialization – II	Accommodate with Identity formation	*	*		*		*	
			Cope-up with competition and conflicts	*	*			*	*	
			Understand the role of education as a critical pedagogy	*	*					
			Evaluate Identity as a teacher	*	*			*	*	
19130 CP24 B	Pedagogy of English: Part - II	Realize the aims and objectives of teaching English						*		
		Learn to cope up with ICT.	*		*		*			
		Get familiarized with the various strategies of teaching English.		*		*		*		
		Learn the art of class room management	*		*		*	*		
19130 CP24 C	Pedagogy of Mathematics: Part - II	Preparing power point presentation	*		*			*		
		Preparation of Lesson plan, unit plan and Year plan.			*			*		
		Preparing digital lesson plan.		*		*		*		
		Practice of skills in Micro teaching.	*		*			*		

19130 CP24 D	Pedagogy of Physical Science: Part - II	Identify the role of physical science teacher	*		*			*	
		Select various books the science library.	*		*		*	*	
		design physical science laboratory	*				*	*	
19130 CP24 E	Pedagogy of Biological Science: Part - II	Reduce the gap between theory and practice	*		*		*		*
		Become self made humane teachers						*	
		Develop knowledge in the emerging teaching and learning technology of Biological science	*	*		*		*	
		Rationalize curricular areas of teacher education to develop ICT knowledge-base	*		*			*	
19130 CP24 F	Pedagogy of Social Science: Part - II	Organize curricular and co-curricular activities in social science.	*		*		*	*	
		Understand the principles of curriculum construction	*		*		*	*	
		Equip themselves with the current technological teaching aids and support	*		*		*	*	
		Acquire knowledge on professional development of teacher	*			*	*	*	
19130 CP24 G	Pedagogy of Commerce and Accountancy : Part – II	Learn Problems and Issues in Teaching Commerce.	*				*	*	*
		Know the Recent developments in Global Level.	*		*		*		*
		Realize the need for life- long education.		*		*		*	

			Know the Mandatory Role of various Educational organizations		*			*	*	*
	19130 CP24 H	Pedagogy of Computer Science: Part - II	Acquire the knowledge about curriculum in Computer Science	*		*		*		*
			Understands the laboratory and Co-Curricular Activities.		*		*		*	
			Gain knowledge about Instructional Resources in Computer Science.	*		*		*		*
	19130 CP24I	Pedagogy of Economics: Part - II	Apply skills effectively on the resources available to teach economics		*			*		*
			Create positive attitude on the curriculum of economics.			*		*		*
			Acquire knowledge on professional development of teacher		*		*			*
	19130 CP24J	Pedagogy of History: Part - II	Know the principles underlying history curriculum	*	*			*		*
			Plan the classroom management			*				*
			Realize the implications of teaching learning materials	*	*		*	*	*	
II	19130 CP24 K	Pedagogy of Geography: Part - II	Integrate and organize Geography curriculum	*	*	*	*		*	
			Identify the various learning resources	*	*			*		
			Understand the diversified needs of the students	*	*	*			*	
	19130 CP25	Essentials of Teaching and	Acquire the knowledge the concept, terms and procedures in teaching and learning.	*	*					

	Learning	Understand the principles and maxims of teaching	*	*		*		*	
		Understand the tasks of teaching		*	*		*	*	
19130 EP26 A	Elective - Environmental Education	Understand the objectives, scope and nature of environment education		*				*	*
		Develop an understanding of natural resources		*		*	*		*
		Understand the causes and remedies for environmental hazards and pollution		*		*		*	*
19130 EP26 B	Exploring library and other learning resources	Enumerate the functions and objectives of library	*		*		*		*
		Explain information sources and services	*		*		*		*
19130 PE31	Knowledge and curriculum	The Epistemological and social bases of Education are highly valued	*						
		The concepts of Nationalism, Universalism and Secularism well appreciated		*		*		*	*

		The concepts of Democracy and Democratic Education are comprehended	*		*		*		*
		The need and value of Education are understood properly		*		*		*	
19130 CP32 A	Pedagogy of Tamil: part – III	Acquire knowledge about different aspects of language	*	*		*	*		
		Master content, pedagogical and technical knowledge	*			*		*	
		Enable them to professionalize teaching of language based on constructive approach		*			*		*
		Use language for effective communication. Familiarize with nature and structure of English language	*	*		*	*		
19130 CP32 B	Pedagogy of English: part – III	Acquire knowledge about different aspects of language	*		*		*		*
		Master content, pedagogical and technical knowledge		*			*		*
		Enable them to professionalize teaching of language based on constructive approach			*		*		*
		Use language for effective communication. Familiarize with nature and structure of English language	*		*				*

	19130 CP32 C	Pedagogy of mathematics part - III	To identify concepts to be transected at various level with special emphasis on mathematics content.	*	*		*			*
			To Explain the planning for theory of set and function	*		*			*	
			To Develop sequences and series of real numbers		*		*		*	
			To Organize the concept for teaching – learning of algebra		*			*		*
	19130 CP32 D	Pedagogy of physical science: part - III	Application of any evaluation technique	*		*			*	
			Preparation of short and objective type test			*				*
			Visit any one science centre and prepare the report	*	*	*	*	*	*	*
III	19130 CP32 E	Pedagogy of biological science - part – III	Become self made professional teachers.	*	*		*			*
			Keep themselves abreast of latest trends and issues in secondary education.		*		*			*
			Understand psychological foundations of education and learning theories	*	*			*		
	19130 CP32	Pedagogy of commerce and	Ancient Trade and Commerce are effectively analyzed.	*			*		*	*

G	accountancy- part – III	Essential Need for Warehouses and the importance of Transport are highly appreciated.	*			*		*	
		Recent development in Global Banking is thoroughly comprehended	*		*		*		
19130 CP32 H	Pedagogy of computer science: PART - III	Know about various polices	*	*		*		*	
		Understand integrating ICT in teaching	*			*			*
		Apply the knowledge in actual classroom in teaching computer science	*			*		*	
19130 CP32I	Pedagogy of economics: PART – III	Create positive attitude on the curriculum of Economics.	*	*			*		
		Applies skill on the problems of teaching Economics.			*		*		
		Develops skill in lifelong learning		*			*		
19130 CP32J	Pedagogy of history- PART – III	Understand the dimensions and classifications of History	*		*	*	*		*
		Develop effective teaching skills.			*	*			*
		Acquire knowledge of the nature, scope, structure and concept of History	*		*		*		*
19130 EP33 A	Drama and art in education	To enable learners to perceptive the social and environmental issues through drama and art	*	*		*		*	

		To develop understanding of the local culture through drama and art.	*	*			*		*
		To widen the understanding of learners by integrating global culture		*		*		*	*
19130 EP33 B	Peace education	Understand the concept of peace and value education.	*	*			*	*	
		Understand the dynamics of transformation of violence into peace.	*	*			*	*	
19130 PE41	Creating an inclusive school	To develop an understanding of the concept of learning disabilities.	*			*		*	
		Critically evaluate the models of disability	*			*		*	
		Discuss the contributions of national and international agencies to inclusive education		*		*		*	
		To develop an understanding of the concept of disability.		*		*		*	
19130 PE42	Gender, school and society	A great amount of knowledge on developed school curriculum for equality and gender just society is gained	*		*		*		*
		The importance of safety of girls and women against sexual abuse and violence of school home and work place is realized greatly.		*		*	*		*

			Gender roles in mass media related to identity and equality are strongly understood	*		*	*		*	
IV	19130 PE43	Language across the curriculum	Does the language clearly convey the meaning of the topic being discussed?	*	*		*		*	
			Is the language learner –friendly?	*		*	*		*	*
			Is the language too technical?	*			*		*	*
	19130 CP44 A	Pedagogy of Tamil: PART – IV	Behest Teaching Of Tamil	*	*		*			*
			To identify learning resources in Tamil	*	*		*	*	*	
	19130 CP44 B	Pedagogy of English: PART – IV	Behest Teaching Of English	*	*		*		*	*
KL Kohl Teaching of English			*	*			*	*		
Shania Bose: Teaching Of English			*	*		*			*	
19130 CP44 C	Pedagogy of mathematics PART - IV	To organist the concept for teaching – learning of complex numbers.	*		*		*		*	
		To identify learning resources in mathematics	*		*		*		*	

			To use of teaching aids and models in school.		*		*		*	
19130 CP44 D	Pedagogy of physical science: PART - IV	Formulate meaningful enquiry episodes	*			*		*		
		Facilitate development of scientific attitude in learners	*		*		*	*		
		Examine different pedagogical issues in learning physical science	*		*		*	*		
19130 CP44 E	Pedagogy of biological science - PART – IV	Become self made professional teachers		*		*		*		
		Understand psychological foundations of education and learning theories	*		*		*	*		
		Keep themselves abreast of latest trends and issues in secondary education.	*		*		*	*		
19130 CP44 G	Pedagogy of commerce and accountancy- PART – IV	Explore the individual differences existing among the learners for effective teaching of commerce and accountancy by the student teachers.	*		*		*	*		
		Explore the individual differences existing among the learners for effective teaching of commerce and accountancy by the student teachers.	*	*		*	*			
		Enable the student teachers for using different strategies and approaches in teaching of Commerce & Accountancy		*		*		*		

			Help the student teachers to understand the instructional materials employed in teaching of Commerce & Accountancy		*		*		*	
	19130 CP44 H	Pedagogy of computer science: PART - IV	Acquire knowledge of the approaches to computer science in level II	*		*	*	*	*	*
			Develop assessment framework in computer science	*		*				
			Organize the concepts for teaching-learning of computer science	*		*		*	*	
	19130 CP44I	Pedagogy of economics: PART – IV	Apply the educational innovation in teaching learning process	*		*		*		
			Develop positive attitude on the text book of Economics.	*		*			*	
			Apply skills effectively on the resources available to teach Economics.	*	*		*		*	
	19130 CP44J	Pedagogy of history- PART – IV	Apply the educational innovation in teaching and learning process	*	*		*		*	
			Acquire adequate knowledge of contents in History.	*	*	*	*			
			Know the importance of co-curricular activities in History.				*		*	
VI	19130 EP45 A	Critical understanding of ICT	Use ICT in educational institutions		*	*		*	*	
			Analyze the role of ICT in Evaluation	*		*		*		*
			Organize and learn through ICT		*			*	*	

VI	19130 EP45 B	Understanding the self	The capacities for Empathic listening and communications skills are developed.		*		*		*	
			Peace, Progress and harmony are established.		*	*	*	*	*	*
			The aims of becoming a self reflective practitioner is achieve		*	*	*	*	*	*



SCHOOL OF EDUCATION
2019 - REGULATION M.Ed.,

Sem	Course code	Course title	CO's	PO's						
				PO1	PO2	PO3	PO4	PO5	PO6	PO7
I	19230PC11	History and political economy of education	A Knowledge of History of Education acquired.	*				*	*	*
			Critical invalidation of Educational Politics Practiced			*	*	*		*
			Political perspectives of education is learnt properly	*	*	*			*	
			Proper understanding of political economy of education achieved	*	*		*		*	
	19230PC12	Advanced educational psychology -I	They understood the various schools of psychology.		*		*		*	
			Adolescent's growth, development and their problems have been realized.	*	*		*		*	
			Various theories of motivation have been understood		*		*		*	
	19230PC13	Curriculum design and development	The contribution of psychologists to the field of curriculum achieved.	*		*		*		*

		Made acquaintance to the students for the need and urgency to change the curriculum.	*		*		*		*
		Implementation and evaluation of curriculum achieved.		*	*			*	*
19230TC14	Basics in educational research-I	Familiarized with various types of research.	*		*			*	*
		Awareness developed in the research process.	*		*		*		*
		Acquired skills to construct suitable tests and tools.	*			*		*	*
19230TE15	Teacher education in indiaelementar ylevel	The context of elementary education knowledge acquired.		*		*		*	
		The objectives, rationale, challenges and extent of success of Universal Elementary Education (UEE) realized.		*		*		*	*
		Knowledge acquired about elementary education in India since independence	*		*		*		*
		Strategies and programmes of UEE adopted.		*		*		*	
19230SC16 A	Structure, status, issues in secondary education	Accomplished Knowledge the context of secondary Education	*		*		*		*
		Achieved the concept, objectives, rationale and context of secondary education		*		*		*	
		Learnt the challenges and extent of success of Universal Elementary	*		*		*		*

19230PC21	History And Political	Acquired knowledge about education under British rule.	*	*			*	*	
		Proper understanding of the preamble of Indian constitution achieved.	*	*		*		*	
		Positive attitude towards nationalism inculcated.	*	*		*	*		*
		Concepts of peace living and global education were established	*	*		*		*	
19230PC22	Advanced Educational Psychology-II	They acquired knowledge about creativity	*		*			*	
		Various theories of personality have been understood		*		*		*	
		They could identify the different types of adjustment mechanism.	*	*			*	*	
		They could classify learning disabilities		*		*		*	
19230PC23	Curriculum Design And Development	Concept and principles of curriculum development and design experienced.	*		*		*		*
		Gained insight in to the development of new curriculum	*		*		*		*
		The continuous Curriculum reconstruction appreciated		*	*		*		*
		Teaching-learning process of curriculum learnt.		*		*		*	
19230TC24	Basics In Educational Research-II	Acquired knowledge of research in the field of education.	*		*			*	*

			Familiarized with various types of research.							
			Developed the skill of selecting a research problem in education and formulate hypotheses.	*	*		*	*		
			Developed an awareness of the steps involved in the research process.		*		*		*	
19230TE25	Teacher Education In Indiaelementary Level-II		Sensitize the student teachers with the need and relevance of Elementary Education as a basic foundation stage	*		*		*		*
			Reflect on the various concerns of Elementary Education including Access, Enrolment, Retention & Achievement	*		*		*		*
			Gain insight into factors promoting the Universalisation of Elementary Education	*		*		*		*
19230SC26 A	Advanced Educational Technology		Understand the meaning of Educational Technology	*	*		*		*	
			Understand the fundamentals of computer		*		*		*	
			Attain knowledge about behavioral technology		*		*		*	
			Understand the meaning and nature of instructional technology		*		*		*	
19230PC31	Planning, administration and management of secondary and higher secondary		Comprehend the development of secondary education in India	*		*		*		*
			Compare the Indian secondary education system with other countries	*		*		*	*	

	education-III	Understand the role and functions of governing agencies of secondary education in India	*	*		*	*		
		Critically evaluate the planning of secondary education in India		*		*		*	
19230PC33	Curriculum, Pedagogy And Assessment At Secondary Level-III	Differentiate the curriculum and syllabus	*		*		*		*
		Understand the theoretical perspectives of curriculum		*	*		*	*	
		Understand the models of curriculum theory	*	*		*		*	
		Understand the models of curriculum design		*		*	*	*	
19230PC34	Advanced educational research and statistics-III	Acquire knowledge about the action research	*		*	*		*	
		Know the process of collecting ,analyzing, interpreting quantitative data	*		*		*	*	
		Understand the models of curriculum design	*		*	*		*	
19230TE35	Teacher education in India-secondary and higher secondary level- III	Analyses the functioning of various agencies of secondary teacher education	*		*		*		*
		Understand the major issues in secondary teacher education	*		*	*		*	
		Analyses the secondary teacher education curriculum and its transaction mode	*		*			*	*

	19230SC36 A	Advanced techniques of education	Understand mobile learning	*	*			*		*
			Use whiteboard for teaching	*		*		*	*	
			Design instructional games	*		*	*		*	
	19230PC41	Philosophical and sociological perspectives in education-IV	Explain the relationship between social system and education	*		*		*		*
			Analyses the role of education in cultural change		*		*		*	
			Explain various agencies of education	*		*	*		*	
IV	19230PC42	Planning, administration and management of secondary and higher secondary education-IV	Critically evaluate the planning of secondary education in India	*	*		*		*	*
			Suggest the areas for research in secondary education	*	*			*	*	
			Discuss the implications of five year plans on secondary education	*	*		*		*	
			Analyze the need for technology integration in planning and administration of secondary education	*	*			*	*	
	19230PC43	Curriculum, pedagogy and assessment at	Understand the influence of views of educational pioneers on today's school		*		*		*	

	secondary level	Analyze the various pedagogical approaches	*		*		*		*
		Understand the different types of assessment techniques		*		*		*	
		Recognize the different methods of curriculum evaluation	*		*			*	*
19230TC44	Advanced educational research and statistics	Acquire knowledge about the action research	*		*			*	
		Know the process of collecting ,analyzing, interpreting quantitative data			*			*	
		Know the process of collecting ,analyzing, interpreting qualitative data	*		*		*		*
		Recognize the different types of parametric tests	*		*			*	
19230TE45	Teacher education in India- secondary level-IV	Analyze the functioning of various agencies of secondary teacher education	*		*		*		*
		Understand the major issues in secondary teacher education	*		*		*	*	
		Understand the importance of preparing special education teachers	*	*			*		*
		Analyze the secondary teacher education curriculum and its transaction mode	*		*	*	*	*	
19230SC46 A	Guidance and counseling	Understand the meaning, need and types of guidance	*		*			*	
		Get acquainted with the tools and techniques of appraisal of an individual	*		*	*		*	

			Understand the meaning, characteristics and types of counseling	*		*		*		*
			Get acquainted with process and techniques of Counseling	*	*		*		*	



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

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

**1.1.1. Relevance of Curriculum to Local, National, Regional, Global,
Development Needs**

COURSE OBJECTIVE R-(2019)

LOCAL NEEDS	
REGIONAL NEEDS	
NATIONAL NEEDS	
GLOBAL NEEDS	

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

COURSE OBJECTIVE

B.TECH (PT) R-(2019)

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.

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

PROGRAMME OUTCOMES:

Engineering Graduates will be able to:

- 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 responsibilities relevant 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.

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

COURSE OBJECTIVE B.TECH (PT) R-(2019)

Coursecode	Course name	Course outcomes
19148S11P	TRANSFORMS AND PARTIAL DIFFERENTIAL EQUATIONS	<ul style="list-style-type: none"> • Be capable of mathematically formulating certain practical problems in terms of partial differential equations, solve them and physically interpret the results. • Have gained a well founded knowledge of Fourier series, their different possible forms and the frequently needed practical harmonic analysis that an engineer may have to make from discrete data. • Have obtained capacity to formulate and identify certain boundary value problems encountered in engineering practices, decide on applicability of the Fourier series method of solution, solve them and interpret the results. • Have grasped the concept of expression of a function, under certain conditions, as a double integral leading to identification of transform pair, and specialization on Fourier transform pair, their properties, the possible special cases with attention to their applications.
19152C12P	ELECTROMAGNETIC THEORY	<ul style="list-style-type: none"> • Display an understanding of fundamental electromagnetic laws and concepts • Write Maxwell's equations in integral, differential and phasor forms and explain their physical meaning • Explain electromagnetic wave propagation in lossy and in lossless media • Solve simple problems requiring estimation of electric and magnetic field quantities based on these concepts and law
19152C13P	DIGITAL ELECTRONICS	<ul style="list-style-type: none"> • Use digital electronics in the present contemporary world • Design various combinational digital circuits using logic gates • Do the analysis and design procedures for synchronous and asynchronous sequential circuits • Use the semiconductor memories and related technology • Use electronic circuits involved in the design of logic gates
19152C14P	ELECTRONIC CIRCUITS –I	<ul style="list-style-type: none"> • The methods of biasing transistors • Design of simple amplifier circuits • Mid – band analysis of amplifier circuits using small - signal equivalent circuits to determine gain input impedance and output impedance • Method of calculating cutoff frequencies and to determine bandwidth • Design of power amplifiers and heat sinks
19152C15P	SIGNALS AND SYSTEMS	<ul style="list-style-type: none"> • To be able to determine if a given system is linear/causal/stable • Capable of determining the frequency components present in a deterministic signal • Capable of characterizing LTI systems in the time domain and frequency domain • To be able to compute the output of an LTI system in the time and frequency domains
19148S21P	NUMERICAL METHODS	<p>The roots of nonlinear (algebraic or transcendental) equations, solutions of large systems of linear equations and eigen value problems of a matrix can be obtained numerically where analytical methods fail to give a solution.</p>

		<ul style="list-style-type: none"> • When huge amounts of experimental data are involved, the methods discussed on interpolation will be useful in constructing an approximate polynomial to represent the data and to find the intermediate values. • The numerical differentiation and integration find application when the function in the analytical form is too complicated or the huge amounts of data are given such as series of measurements, observations or someother empirical information. • Since many physical laws are couched in terms of rate of change of one/two or more independent variables, most of the engineering problems are characterized in the form of either nonlinear ordinary differential equations or partial differential equations. The methods introduced in the solution of ordinary differential equations and partial differential equations will be useful in attempting any engineering problem.
19152C22P	ELECTRICAL ENGINEERING AND CONTROL SYSTEMS	<ul style="list-style-type: none"> • To understand the operation of Electrical machines and transformers • To understand the open loop and closed loop (feedback)systems • To understand time domain and frequency domain analysis of control systems required for stability analysis. • To understand the compensation technique that can be used to stabilize control system
19152C23P	LINEAR INTEGRATED CIRCUITS	<ul style="list-style-type: none"> • To introduce the basic building blocks of linearintegrated circuits. • To teach the linear and non-linear applications of operational amplifiers. • To introduce the theory and applications of analog multipliers and PLL. • To teach the theory of ADC and DAC • To introduce a few special function integrated circuits.
19152C24P	ELECTRONIC CIRCUITS-II	<ul style="list-style-type: none"> • The advantages and method of analysis of feed backamplifiers • Analysis and design of RC and LC oscillators, tuned amplifiers, wave shaping circuits, multivibrators, blocking oscillators and time based generators.
19152C25P	TRANSMISSION LINES AND WAVEGUIDES	<ul style="list-style-type: none"> • To become familiar with propagation of signals throughlines • Understand signal propagation at Radio frequencies • Understand radio propagation in guided systems • To become familiar with resonators
19148S31BP	PROBABILITY AND RANDOM PROCESSES	<ul style="list-style-type: none"> • Have a fundamental knowledge of the basic probabilityconcepts. • Have a well – founded knowledge of standard distributions which can describe real life phenomena. • Acquire skills in handling situations involving more than one random variable and functions of random variables. • Understand and characterize phenomena which evolve with respect to time in probabilistic manner. • Be able to analyze the response of random inputs to linear time invariant systems.
19152C32P	MICROPROCESSOR, INTERFACING AND APPLICATIONS	<ul style="list-style-type: none"> • To introduce the architecture and programming of 8085 microprocessors. • To introduce the interfacing of peripheral devices with 8085 microprocessors. • To introduce the architecture and programming of an 8086 microprocessor. • To introduce the applications, programming with an 8085 microprocessor.

19152C33P	DIGITAL SIGNAL PROCESSING	<ul style="list-style-type: none"> To study DFT and its computation To study the design techniques for digital filters To study the finite word length effects in signal processing To study the non-parametric methods of power spectrum estimations To study the fundamentals of digital signal processors.
19152C34P	COMMUNICATION THEORY	<ul style="list-style-type: none"> To provide various Amplitude modulation and demodulation systems. To provide various Angle modulation and demodulationsystems. To provide some depth analysis in noise performance of various receivers. To study some basic information theory with some channel coding theorems
19152L35P	DIGITAL SIGNAL PROCESSING AND MICROPROCESSOR LAB	<ul style="list-style-type: none"> Carryout basic signal processing operations Design and Implement the FIR and IIR Filters in DSP Processor for performing filtering operation over real-time signals Interface different I/Os with processor Generate waveforms using Microprocessors Execute Programs in 8085
119152C41P	DIGITAL COMMUNICATION	<ul style="list-style-type: none"> To study pulse modulation and discuss the process of sampling, quantization and coding that are fundamental to the digital transmission of analog signals. To learn baseband pulse transmission, which deals with the transmission of pulse-amplitude, modulated signals in their baseband form.
19152C42P	ANTENNA AND WAVE PROPAGATION	<ul style="list-style-type: none"> To study radiation from a current element. To study antenna arrays To study aperture antennas To learn special antennas such as frequency independent and broadband antennas.
19152C43P	COMPUTER NETWORKS	<ul style="list-style-type: none"> To introduce the students the functions of different layers. To introduce IEEE standards employed in computer networking.
19152L45P	NETWORKS AND COMMUNICATION LAB	<ul style="list-style-type: none"> Communicate between two desktop computers Implement the different protocols Implement and compare the various routing algorithms Use the simulation tool. Simulate & validate the various functional modules of a communication system Apply various channel coding schemes & demonstrate their capabilities towards the improvement of the noise performance of communication system
19152C51P	OPTICAL COMMUNICATION AND NETWORKS	<ul style="list-style-type: none"> To learn the basic elements of optical fiber transmission link, fiber modes configurations and structures. To understand the different kinds of losses, signal distortion in optical waveguides and other signal degradation factors. Design optimization of SM fibers, RI profile and cut-off wavelength. To learn the various optical source materials, LED structures, quantum efficiency, Laser diodes and different fiber amplifiers. To learn the fiber optical receivers such as PIN APD diodes, noise performance in photo detector, receiver operation and configuration.

19152C52P	MICROWAVE ENGINEERING	<ul style="list-style-type: none"> To study passive microwave components and their S-Parameters. To study Microwave semiconductor devices & applications. To study Microwave sources and amplifiers.
19152C53P	VLSI DESIGN	<ul style="list-style-type: none"> To learn the basic CMOS circuits. To learn the CMOS process technology. To learn techniques of chip design using programmable devices. To learn the concepts of designing VLSI subsystems.
19152L55P	OPTICAL COMMUNICATION AND MICROWAVE LAB	<ul style="list-style-type: none"> Analyze the performance of a simple optical link. Test microwave and optical components. Analyse the mode characteristics of fiber Analyse the radiation pattern of the antenna.
19152C61P	MOBILE AND WIRELESS COMMUNICATION	<ul style="list-style-type: none"> It deals with the fundamental cellular radio concepts such as frequency reuse and handoff. This also demonstrates the principle of trunking efficiency and how trunking and interference issues between mobile and base stations combine to affect the overall capacity of cellular systems. It presents different ways to radio propagation models and predict the large – scale effects of radio propagation in many operating environments. This also covers small propagation effects such as fading, time delay spread and Doppler spread and describes how to measure and model the impact that signal bandwidth and motion have on the instantaneous received signal through the multipath channel. It provides ideas about analog and digital modulation techniques used in wireless communication. It also deals with the different types of equalization techniques and diversity concepts.
19152C62P	MEDICAL ELECTRONICS	<ul style="list-style-type: none"> To study the methods of recording various biopotentials To study how to measure biochemical and various physiological information To understand the working of units which will help to restore normal functioning To understand the use of radiation for diagnostic and therapy To understand the need and technique of electrical safety in Hospitals
19152C63P	MICROCONTROLLER AND EMBEDDED SYSTEMS	<ul style="list-style-type: none"> To study 8051 architecture To write assembly language programming To study the embedded architecture and real time applications
19152L65P	VLSI AND EMBEDDED SYSTEMS LAB	<ul style="list-style-type: none"> Write HDL code for basic as well as advanced digital integrated circuit Import the logic modules into FPGA Boards Synthesize Place and Route the digital IPs Write programs in ARM for a specific Application Interface memory, A/D and D/A converters with ARM system Analyze the performance of interrupt Write a program for interfacing keyboard, display, motor and sensor.
19160S71P	TOTAL QUALITY MANAGEMENT	<ul style="list-style-type: none"> The student would be able to apply the tools and techniques of quality management to manufacturing and services processes.
19152C72P	WIRELESS NETWORKS	<ul style="list-style-type: none"> To understand physical as wireless MAC layer alternatives techniques. To learn planning and operation of wireless networks. To study various wireless LAN and WAN concepts. To understand WPAN and geo-location systems.

19152C73P	TELECOMMUNICATION SWITCHING AND NETWORKS	<ul style="list-style-type: none"> • To introduce the concepts of Frequency and Time division multiplexing. • To introduce digital multiplexing and digital hierarchy namely SONET / SDH • To introduce the concepts of space switching, time switching and combination switching, example of a switch namely No.4 ESS Toll switch. • To introduce the need for network synchronization and study synchronization issues. To outline network control and management issues. • To study the enhanced local loop systems in a digital environment. To introduce ISDN, DSL / ADSL, and fiber optic systems in the subscriber loop.
19152E44AP	HIGH SPEED NETWORKS	<ul style="list-style-type: none"> • Students will get an introduction about ATM and Framereelay. • Students will be provided with an up-to-date survey of developments in High Speed Networks. • Enable the students to know techniques involved to support real-time traffic and congestion control. • Students will be provided with different levels of quality of service (Q.S) to different applications.
19152E44BP	ADVANCED DIGITAL SIGNAL PROCESSING	<ul style="list-style-type: none"> • To study the parametric methods for power spectrum estimation. • To study adaptive filtering techniques using LMS algorithms and to study the applications of adaptive filtering. • To study multirate signal processing fundamentals. • To study the analysis of speech signals. • To introduce the student to wavelet transforms.
19152E44CP	SPEECH PROCESSING	<ul style="list-style-type: none"> • To introduce the models for speech production • To develop time and frequency domain techniques for estimating speech parameters • To introduce a predictive technique for speech compression • To understand speech recognition, synthesis and speaker identification.
19152E44DP	FUZZY LOGIC AND NEURAL NETWORKS	<ul style="list-style-type: none"> • To introduce the ideas of fuzzy sets, fuzzy logic and use of heuristics based on human experience • To become familiar with neural networks that can learn from available examples and generalize to form appropriate rules for inferencing systems • To provide the mathematical background for carrying out the optimization associated with neural network learning • To familiarize with genetic algorithms and other random search procedures useful while seeking global optimum in self-learning situations • To introduce case studies utilizing the above and illustrate the intelligent behavior of programs based on soft computing
19152E44EP	ADVANCED ELECTRONIC SYSTEM DESIGN	<ul style="list-style-type: none"> • To study RF components such as resonator, filter, transmission lines, etc... • To learn design of RF amplifiers using transistors. • To study modern Power Supplies using SCR and SMPS technology • To learn about signal shielding & grounding techniques and study of A/D and D/A Converters. • To learn knowledge about fabrication of PCBs using CAD.

19158E54AP	ENVIRONMENTAL SCIENCE AND ENGINEERING	<ul style="list-style-type: none"> • Environmental Pollution or problems cannot be solved by mere laws. Public participation is an important aspect which serves the environmental Protection. One will obtain knowledge on the following after completing the course. • Public awareness of the environment is at an infant stage. • Ignorance and incomplete knowledge has lead to misconceptions • Development and improvement in standard of living has lead to serious environmental disasters
19152E54BP	OPTO ELECTRONIC DEVICES	<ul style="list-style-type: none"> • To know the basics of solid state physics and understand the nature and characteristics of light. • To understand different methods of luminescence, display devices and laser types and their applications. • To learn the principle of optical detection mechanism in different detection devices. • To understand different light modulation techniques and the concepts and applications of optical switching. • To study the integration process and application of opto electronic integrated circuits in transmitters and receivers.
19152E54CP	RADAR AND NAVIGATIONAL AIDS	<ul style="list-style-type: none"> • To derive and discuss the Range equation and the nature of detection. • To apply doppler principle to radars and hence detect moving targets, cluster, also to understand tracking radars • To refresh principles of antennas and propagation as related to radars, also study of transmitters and receivers. • To understand principles of navigation, in addition to approach and landing aids as related to navigation • To understand navigation of ships from shore to shore.
19152E54DP	DIGITAL IMAGE PROCESSING	<ul style="list-style-type: none"> • To study the image fundamentals and mathematical transforms necessary for image processing. • To study the image enhancement techniques • To study image restoration procedures. • To study the image compression procedures. • To study the image segmentation and representation techniques.
19152E54EP	ENGINEERING ACOUSTICS	<ul style="list-style-type: none"> • To provide mathematical basis for acoustics waves • To introduce the concept of radiation reception absorption and attenuation of acoustic waves. • To present the characteristic behaviour of sound in pipes, resonators and filters. • To introduce the properties of hearing and speech • To describe the architecture and environment inclusive of reverberation and noise
19160E64AP	PRINCIPLES OF MANAGEMENT	<ul style="list-style-type: none"> • Upon completion of the course, students will be able to have clear understanding • Managerial functions like planning, organizing, staffing, leading & controlling and have same basic knowledge on international aspect of management • leading & controlling and have same basic knowledge on international aspect of management

LOCAL NEEDS

REGIONAL NEEDS

NATIONAL NEEDS

GLOBAL NEEDS

19152E64BP	SATELLITE COMMUNICATION	<ul style="list-style-type: none"> Overview of satellite systems in relation to other terrestrial systems. Study of satellite orbits and launching. Study of earth segment and space segment components Study of satellite access by various users. Study of DTH and compression standards.
19152E64CP	ROBOTICS	<ul style="list-style-type: none"> The course has been so designed to give the students an overall view of the mechanical components and mathematics associated with the same. Actuators and sensors necessary for the functioning of the robot.
19152E64DP	REMOTE SENSING	<ul style="list-style-type: none"> Principles of Remote Sensing and GIS Analysis of RS and GIS data and interpreting the data for modeling application
19150E64EP	NETWORK SECURITY	<ul style="list-style-type: none"> To know the methods of conventional encryption. To understand the concepts of public key encryption and number theory To understand authentication and Hash functions To know the network security tools and applications. To understand the system level security used
19152E74AP	POWER ELECTRONICS	<ul style="list-style-type: none"> To study about power electronic circuits for voltage and current control and protection. To learn the switching characteristics of transistors and SCRs. Series and parallel functions of SCRs, Programmable triggering methods of SCR. To learn controlled rectification AC supplies. To study converters and inverters. To learn about motor control, charges, SMPS and UPS.
19152E74BP	ADVANCED MICROPROCESSORS	<ul style="list-style-type: none"> To introduce the concepts in the internal programming model of Intel family of microprocessors. To introduce the programming techniques using MASM.
19152E74CP	ELECTROMAGNETIC INTERFERENCE AND COMPATIBILITY	<ul style="list-style-type: none"> To understand EMI Sources, EMI problems and their solution methods in PCB level / Subsystem and system level design. To measure the emission. immunity level from different systems to couple with the prescribed EMC standards
19152E74DP	SOLID STATE ELECTRONIC DRIVES	<ul style="list-style-type: none"> To learn crystal structures of elements used for fabrication of semiconductor devices. To study energy band structure of semiconductor devices. To understand fermi levels, movement of charge carriers, Diffusion current and Drift current.
19152E74EP	COMPUTER HARDWARE AND INTERFACING	<ul style="list-style-type: none"> To introduce issues related to CPU and memory. To understand the components on the motherboard To understand different storage media To introduce the features of different I/O peripheral devices and their interfaces

19248S11BP	Applied Mathematics for Electronics Engineering	<ul style="list-style-type: none"> • The primary aim of this course is to demonstrate various analytical skills in applied mathematics • extensive experience with the tactics of problem solving and logical thinking applicable in communication engineering
19271C12P	Statistical Signal Processing	<ul style="list-style-type: none"> • The student is conversant with important theorems and algorithms. • The student learns relevant figures of merit such as power, energy, bias and consistency. • The student is familiar with estimation, prediction and filtering concepts and techniques • Formulate time domain and frequency domain description of Wide Sense Stationary process in terms of matrix algebra and relate to linear algebra concepts. • State Parseval's theorem, W-K theorem, principle of orthogonality, spectral factorization theorem, Widrow-Hoff LMS algorithm and Shannon's sampling theorem, and define linear prediction, linear estimation, sample auto-correlation, periodogram, bias and consistency. • Explain various noise types, Yule-Walker algorithm, parametric and non-parametric methods, Wiener and Kalman filtering, LMS and RMS algorithms, Levinson Durbin algorithm, adaptive noise cancellation and adaptive echo cancellation, speed verses convergence issues, channel equalization, sampling rate change, subband coding and wavelet transform. • Calculate mean, variance, auto-correlation and PSD for WSS stochastic processes, and derive prediction error criterion, Wiener-Hoff equations, Parseval's theorem, W-K theorem and normal equations. <p>Design AR, MA, ARMA models, Weiner filter, anti aliasing and anti imaging filters, and develop FIR adaptive filter and polyphase filter structures.</p>

		<ul style="list-style-type: none"> • Simulate spectral estimation algorithms and basic models on computing platforms.
19271C13P	Modern Digital Communication Systems	<ul style="list-style-type: none"> • To understand the coherent and noncoherent receivers and its impact on different channel characteristics. • To understand the different Equalizers • To understand the different block coded and convolutional coded digital communication systems. • To understand the basics of Multicarrier and Multiuser Communications. • Develop the ability to understand the concepts of signal space analysis for coherent and non-coherent receivers. • Conceptually appreciate different Equalization techniques • Possess knowledge on different block codes and convolutional codes. • Comprehend the generation of OFDM signals and the techniques of multiuser detection.
19271L14P	Communication Systems Lab - I	<ul style="list-style-type: none"> • To acquire knowledge on Transmission line and S-parameter estimation of microwave devices. • To study & measure the performance of digital communication systems. • To provide a comprehensive knowledge of Wireless Communication. • To learn about the design of digital filters and its adaptive filtering algorithms. • Measure and analyze various transmission line parameters. • Implement the adaptive filtering algorithms • To generate and detect digital communication signals of various modulation techniques using MATLAB

19271C21P	Mobile Communication Networks	<ul style="list-style-type: none"> • To understand the basic cellular system concepts. • To have an insight into the various propagation models and the speech coders used in mobile communication. • To understand the multiple access techniques and interference education techniques in mobile communication • Discuss cellular radio concepts. • Identify various propagation effects. • To have knowledge of the mobile system specifications. • Classify multiple access techniques in mobile communication. • Outline cellular mobile communication standards. • Analyze various methodologies to improve the cellular capacity
19271C22P	Advanced Microwave Systems	<ul style="list-style-type: none"> • To understand the fundamentals of Microwave integrated circuits. • To understand the various components for Wireless Communications. • To know the basic techniques needed for analysis of Microwave systems. • Capability to design Microwave circuits. • To be able to analyze microwave integrated circuits.
19271L24P	Communication Systems Lab - II	<ul style="list-style-type: none"> • To enable the students to verify the basic principles and design aspects involved in high frequency communication systems components • To expose the student to different high frequency components and conduct the experiments to analyze and interpret data to produce meaningful conclusions and match with theoretical concepts. • To design and develop RF components using microstrip

LOCAL NEEDS

REGIONAL NEEDS

NATIONAL NEEDS

GLOBAL NEEDS

		<p>technology</p> <ul style="list-style-type: none"> Apply knowledge to identify a suitable architecture and systematically design an RF system. Comprehensively record and report the measured data, and would be capable of analyzing, interpreting the experimentally measured data and producing meaningful conclusions. Design and develop microstrip filters
19271C31P	Communication Protocol Engineering	<ul style="list-style-type: none"> To enable the student to understand the basics of switching technologies and their implementation LANs, ATM networks and IP networks. To enable the student to understand the different switching architectures and queuing strategies and their impact on the blocking performances
19271C32P	Advanced Radiation Systems	<ul style="list-style-type: none"> To understand antenna radiation and its parameters. To enhance the student's knowledge in the area of various antenna design. To design monopole, dipole and patch antenna and to impart the knowledge about modern antennas
19271C41P	Wireless Sensor Networks	<ul style="list-style-type: none"> Familiar with the latest 4G networks and LTE Understand about the wireless IP architecture and LTE network architecture. Familiar with the adaptive link layer and network layer graphs and protocol. Understand about the mobility management and cellular network. Understand about the wireless sensor network architecture and its concept. .
19271C42P	Fiber Optic Networking	<ul style="list-style-type: none"> Optical system components like optical amplifiers, wavelength converters. Up-to-date survey of development in Optical Network

LOCAL NEEDS

REGIONAL NEEDS

NATIONAL NEEDS

GLOBAL NEEDS

		<p>Architectures.</p> <ul style="list-style-type: none"> • Packet switching. • Network design perspectives. • Different Optical Network management techniques and functions
19271E23AP	High Speed Switching Architecture	<ul style="list-style-type: none"> • Apply knowledge to identify a suitable architecture and systematically design an RF system. • Comprehensively record and report the measured data, and would be capable of analyzing, interpreting the experimentally measured data and producing meaningful conclusions. • Design and develop microstrip filters
19271E23BP	DSP Processor Architecture and Programming	<ul style="list-style-type: none"> • State Parseval's theorem, W-K theorem, principle of orthogonality, spectral factorization theorem, Widrow-Hoff LMS algorithm and Shannon's sampling theorem, and define linear prediction, linear estimation, sample auto-correlation, periodogram, bias and consistency. • Explain various noise types, Yule-Walker algorithm, parametric and non-parametric methods, Wiener and Kalman filtering, LMS and RMS algorithms, Levinson Durbin algorithm, adaptive noise cancellation and adaptive echo cancellation, speed verses convergence issues, channel equalization, sampling rate change, subband coding and wavelet transform
19271E23CP	Digital Speech Processing	<ul style="list-style-type: none"> • To understand the basic principles of digital communication techniques. • To gain knowledge about receivers for AWGN channel and Fading channels. • To understand the concepts of synchronization and adaptive equalization techniques • Apply basic principles of digital communication techniques. • Discuss on receivers for AWGN & Fading channel • Describe various synchronization techniques.

		<ul style="list-style-type: none"> • Design adaptive equalization algorithms to satisfy the evolving demands in digital communication.
19271E33AP	Internetworking and Multimedia	<ul style="list-style-type: none"> • To provide adequate knowledge about the applications of Soft Computing • Knowledge on concepts of soft computational techniques. • Able to apply soft computational techniques to solve various problems. • Motivate to solve research oriented problems.
19271E33BP	Digital Image Processing	<ul style="list-style-type: none"> • To understand the concepts of synchronization and adaptive equalization techniques • Apply basic principles of digital communication techniques. • Discuss on receivers for AWGN & Fading channel • Describe various synchronization techniques. • Design adaptive equalization algorithms to satisfy the evolving demands in digital communication
19271E33CP	LASER Communication	<ul style="list-style-type: none"> • Up-to-date survey of development in Optical Network Architectures. • Packet switching. • Network design perspectives.
19271E43AP	Digital Communication Receivers	<ul style="list-style-type: none"> • Measure and analyze various transmission line parameters. • Implement the adaptive filtering algorithms • To generate and detect digital communication signals of various modulation techniques using MATLAB
19271E43BP	Soft Computing	<ul style="list-style-type: none"> • To provide adequate knowledge about feed forward /feedback neural networks • To apply the concept of fuzzy logic in various systems. • To have the idea about genetic algorithms. • To provide adequate knowledge about the applications of

LOCAL NEEDS

REGIONAL NEEDS

NATIONAL NEEDS

GLOBAL NEEDS

		<p>Soft Computing</p> <ul style="list-style-type: none"> • Knowledge on concepts of soft computational techniques. • Able to apply soft computational techniques to solve various problems. • Motivate to solve research oriented problems.
19271E43CP	Communication Network Security	<ul style="list-style-type: none"> • Understand the need and concept of security • Learn cryptosystems <ul style="list-style-type: none"> • Explain digital signature standards • Discuss authentication • Explain security at different layers
19271E51AP	Software Defined Radio	<ul style="list-style-type: none"> • Understand the concepts of software defined radio • Learn spectrum sensing and dynamic spectrum access • Compare MAC and network layer design for software defined radio • Discuss cognitive radio for Internet of Things and M2M technologies
19271E51BP	Satellite Communication	<ul style="list-style-type: none"> • Learn M2M developments and satellite applications • Understand Satellite Communication In Ipv6 Environment • Discuss satellite navigation and global positioning system • Outline deep space networks and inter planetary missions
19271E51CP	CDMA Systems	<ul style="list-style-type: none"> • understand cellular concept, widely popular 2G digital, TDMA based mobile system GSM and modern mobile wireless system CDMA.

LOCAL NEEDS

REGIONAL NEEDS

NATIONAL NEEDS

GLOBAL NEEDS

		<ul style="list-style-type: none"> Analyze MIMO system. Discuss millimeter wave communication. Demonstrate software defined radio and cognitive radio.
19271E52AP	Wavelets and Multi Resolution Processing	<ul style="list-style-type: none"> To study system design using Wavelets To learn the different wavelet families & their applications The students will be able to apprehend the detailed knowledge about the Wavelet transform & its applications.
19271E52BP	High Performance Communication Networks	<ul style="list-style-type: none"> To appreciate the need for interoperable network management as a typical distributed application To be aware of current trends in network technologies Diagnose problems and make minor repairs to computer networks using appropriate diagnostics software Demonstrate how to correctly maintain LAN computer systems Maintain the network by performing routine maintenance tasks Apply network management tools
19271E52CP	Advanced Microprocessors and Microcontrollers	<ul style="list-style-type: none"> To enable the students to understand various microcontroller architectures To expose the students to the fundamentals of microprocessor architecture The student will be able to work with a suitable microprocessor / microcontroller for a specific real world application.
19271E53AP	Simulation of Communication Networks	<ul style="list-style-type: none"> Learn modeling and simulation Understand Monte Carlo simulation Study channel modeling and mobility modeling Apply Monte Carlo simulation Discuss Lower Layer and Link Layer Wireless Modeling Compare channel modeling and mobility modeling

LOCAL NEEDS

REGIONAL NEEDS

NATIONAL NEEDS

GLOBAL NEEDS

19271E53BP	Medical Imaging	<ul style="list-style-type: none"> • To study the special imaging techniques used for visualizing the cross sections of the body. • To study the imaging of soft tissues using ultrasound technique • Explain computer aided tomography • Discuss ultrasonic systems • Outline magnetic resonance imaging
19271E53CP	Mobile ADHOC networks	<ul style="list-style-type: none"> • To learn various fundamental and emerging protocols of all layers. • To study about the issues pertaining to major obstacles in establishment and efficient management of Ad-hoc and sensor networks. • To understand the nature and applications of Ad-hoc and sensor networks. • To understand various security practices and protocols of Ad-hoc and Sensor Networks • Identify different issues in wireless ad hoc and sensor networks. • To analyze protocols developed for ad hoc and sensor networks. • To identify and address the security threats in ad hoc and sensor networks. • Establish a Sensor network environment for different types of applications.



School: ENGINEERING AND TECHNOLOGY

Dept: ECE- BTech (FT)

Mapping of COs and Pos

2019 regulation- UG (FT)

Sem	Course Code	Title of the Course	COs	POS											
				PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO12
I	19147S11	Communicative English	<ul style="list-style-type: none"> • Read articles of a general kind in magazines and newspapers. • Participate effectively in informal conversations; introduce themselves and their friends and express opinions in English. • Comprehend conversations and short talks delivered in English • Write short essays of a general kind and personal letters and emails in English. 	?	?	?	?	?	✓	✓	✓	✓	✓	✓	?



Mapping of COs and Pos

19148S12	Engineering Mathematics – I	<ul style="list-style-type: none"> • Use both the limit definition and rules of differentiation to differentiate functions. • Apply differentiation to solve maxima and minima problems. • Evaluate integrals both by using Riemann sums and by using the Fundamental Theorem of Calculus. • Apply integration to compute multiple integrals, area, volume, integrals in polar coordinates, in addition to change of order and change of variables. • Evaluate integrals using techniques of integration, such as substitution, partial fractions and integration by parts. 	✓	✓	✓	✓	?	?	?	?	?	?	?	✓	✓
----------	-----------------------------	--	---	---	---	---	---	---	---	---	---	---	---	---	---



Mapping of COs and Pos

		<ul style="list-style-type: none"> • Determine convergence/divergence of improper integrals and evaluate convergent improper integrals. • Apply various techniques in solving differential equations. 													
19149S13	Engineering Physics	<ul style="list-style-type: none"> • The students will gain knowledge on the basics of properties of matter and its applications, • The students will acquire knowledge on the concepts of waves and optical devices and their applications in fibre optics, • The students will have adequate knowledge on the concepts of thermal properties of materials and their applications in 	✓	✓	✓	✓	?	?	?	?	?	?	✓	✓	



Mapping of COs and Pos

		<p>expansion joints and heat exchangers,</p> <ul style="list-style-type: none"> • The students will get knowledge on advanced physics concepts of quantum theory and its applications in tunneling microscopes, and • The students will understand the basics of crystals, their structures and different crystal growth techniques. 													
19149S14	Engineering Chemistry	<ul style="list-style-type: none"> • The knowledge gained on engineering materials, fuels, energy sources and water treatment techniques will facilitate better understanding of engineering processes and applications for further learning. 	✓	✓	✓	✓	?	?	?	?	?	?	✓	✓	



Mapping of COs and Pos

19154S15	Engineering Graphics	<ul style="list-style-type: none"> Familiarize with the fundamentals and standards of Engineering graphics Perform freehand sketching of basic geometrical constructions and multiple views of objects. Project orthographic projections of lines and plane surfaces. Draw projections and solids and development of surfaces. Visualize and to project isometric and perspective sections of simple solids. 	✓	?	?	?	?	?	?	?	?	?	✓	✓	✓
19150S16	Problem Solving and Python	<ul style="list-style-type: none"> Develop algorithmic solutions to simple computational problems Read, write, execute 	✓	✓	✓	✓	✓	?	?	?	?	?	✓	✓	



Mapping of COs and Pos

	Programming	<p>by hand simple Python programs.</p> <ul style="list-style-type: none"> • Structure simple Python programs for solving problems. • Decompose a Python program into functions. • Represent compound data using Python lists, tuples, dictionaries. • Read and write data from/to files in Python Programs. 												
19150L17	Problem Solving and Python Programming Laboratory	<ul style="list-style-type: none"> • Write, test, and debug simple Python programs. • Implement Python programs with conditionals and loops. • Develop Python programs step-wise by defining functions and calling them. • Use Python lists, 	✓	✓	✓	✓	?	?	?	?	?	?	✓	✓



Mapping of COs and Pos

		<p>tuples, dictionaries for representing compound data.</p> <ul style="list-style-type: none"> • Read and write data from/to files in Python. 													
19149L18	Physics and Chemistry Laboratory	<p>Upon completion of the course, the students will be able to apply principles of elasticity, optics and thermal properties for engineering applications.</p> <ul style="list-style-type: none"> • To make the student to acquire practical skills in the determination of water quality parameters through volumetric and instrumental analysis. • To acquaint the students with the determination of molecular weight of a 	✓	✓	✓	✓	?	?	?	?	?	?	?	✓	✓



Mapping of COs and Pos

			polymer by viscometry.												
	191VEA19	Value Education	<ul style="list-style-type: none"> • To learn about philosophy of Life and Individual qualities • To learn and practice social values and responsibilities • To learn and practice mind culture, forces acting on the body • To learn more of Responsibilities and Rights as Professional and facing Global Challenges • Emerge as responsible citizen with clear conviction to be a role-model in the society. 	?	?	✓	?	✓	?	✓	✓	✓	✓	✓	?
II	19147S21	Technical English	<ul style="list-style-type: none"> • Read technical texts and write area- specific texts effortlessly. • Listen and 	?	?	?	?	✓	✓	✓	✓	✓	✓	✓	✓



Mapping of COs and Pos

		<p>comprehend lectures and talks in their area of specialisation successfully.</p> <ul style="list-style-type: none"> • Speak appropriately and effectively in varied formal and informal contexts. • Write reports and winning job applications. 												
19148S22	Engineering Mathematics – II	<ul style="list-style-type: none"> • Eigenvalues and eigenvectors, diagonalization of a matrix, Symmetric matrices, Positive definite matrices and similar matrices. • Gradient, divergence and curl of a vector point function and related identities. • Evaluation of line, surface and volume 	✓	✓	✓	✓	?	?	?	?	?	?	✓	✓



Mapping of COs and Pos

		<p>integrals using Gauss, Stokes and Green's theorems and their verification.</p> <ul style="list-style-type: none"> Analytic functions, conformal mapping and complex integration. Laplace transform and inverse transform of simple functions, properties, various related theorems and application to differential equations with constant coefficients. 													
19149S23B	Physics for Electronics Engineering	<ul style="list-style-type: none"> Gain knowledge on classical and quantum electron theories, and energy band structures, Acquire knowledge on basics of semiconductor physics and its applications in various 	✓	✓	✓	✓	?	?	?	?	?	?	✓	✓	



Mapping of COs and Pos

		devices, • Get knowledge on magnetic and dielectric properties of materials, • Have the necessary understanding on the functioning of optical materials for optoelectronics, • Understand the basics of quantum structures and their applications in spintronics and carbon electronics.													
19153S24B	Basic Electrical and Instrumentation Engineering	• Understand the concept of three phase power circuits and measurement. • Comprehend the concepts in electrical generators, motors and transformers • Choose appropriate measuring instruments	✓	✓	✓	✓	✓	✓	?	?	?	?	✓	✓	



Mapping of COs and Pos

		for given application												
19152S25B	Circuit Analysis	<ul style="list-style-type: none"> Develop the capacity to analyze electrical circuits, apply the circuit theorems in real time Design and understand and evaluate the AC and DC circuits. 	✓	✓	✓	✓	✓	✓	?	?	?	?	✓	✓
19152S26B	Electronic Devices	<ul style="list-style-type: none"> Explain the V-I characteristic of diode, UJT and SCR Describe the equivalence circuits of transistors Operate the basic electronic devices such as PN junction diode, Bipolar and Field effect Transistors, Power control devices, LED, LCD and other Opto-electronic devices 	✓	✓	✓	✓	✓	✓	?	?	?	?	✓	✓



School: ENGINEERING AND TECHNOLOGY

Dept: ECE- BTech (FT)

Mapping of COs and Pos

19154L27	Engineering Practices Laboratory	<ul style="list-style-type: none"> • Fabricate carpentry components and pipe connections including plumbing works. • Use welding equipments to join the structures. • Carry out the basic machining operations • Make the models using sheet metal works • Illustrate on centrifugal pump, Air conditioner, operations of smithy, foundary and fittings • Carry out basic home electrical works and appliances • Measure the electrical quantities • Elaborate on the components, gates, soldering practices. 	✓	✓	✓	✓	✓	?	?	?	?	?	✓	✓
----------	----------------------------------	---	---	---	---	---	---	---	---	---	---	---	---	---



School: ENGINEERING AND TECHNOLOGY

Dept: ECE- BTech (FT)

Mapping of COs and Pos

19152L28B	Circuits and Devices Laboratory	<ul style="list-style-type: none"> Analyze the characteristics of basic electronic devices Design RL and RC circuits Verify Thevinin & Norton theorem KVL & KCL, and Super Position Theorems 	✓	✓	✓	✓	✓	?	?	?	?	?	✓	✓
191ICA29	Fundamentals of Indian Constitution and Economy	<ul style="list-style-type: none"> Understand the emergence and evolution of Indian Constitution. Understand the structure and composition of Indian Constitution Understand and analyse federalism in the Indian context. Understand and analyse the three organs of the state in the contemporary scenario. 	?	?	✓	?	?	✓	✓	✓	✓	✓	?	?



Mapping of COs and Pos

			<ul style="list-style-type: none"> Understand and Evaluate the Indian Political scenario amidst the emerging challenges. 													
III	19148S31B	Linear Algebra and Partial Differential Equations	<ul style="list-style-type: none"> Explain the fundamental concepts of advanced algebra and their role in modern mathematics and applied contexts. Demonstrate accurate and efficient use of advanced algebraic techniques. Demonstrate their mastery by solving non-trivial problems related to the concepts and by proving simple theorems about the statements proven by the text. Able to solve various 	✓	✓	✓	✓	✓	?	?	?	?	?	✓	✓	



Mapping of COs and Pos

			types of partial differential equations. Able to solve engineering problems using Fourier series.												
19152C32	Control Systems Engineering	<ul style="list-style-type: none"> Identify the various control system components and their representations. Analyze the various time domain parameters. Analysis the various frequency response plots and its system. Apply the concepts of various system stability criterions. Design various transfer functions of digital control system using state variable models. 	✓	✓	✓	✓	✓	✓	?	?	?	?	✓	✓	



Mapping of COs and Pos

19152C33	Fundamentals of Data Structures In C	<ul style="list-style-type: none"> • Implement linear and non-linear data structure operations using C • Suggest appropriate linear / non-linear data structure for any given data set. • Apply hashing concepts for a given problem • Modify or suggest new data structure for an application • Appropriately choose the sorting algorithm for an application 	✓	✓	✓	✓	✓	✓	?	?	?	?	✓	✓
19152C34	Digital Electronics	<ul style="list-style-type: none"> • Use digital electronics in the present contemporary world • Design various combinational digital circuits using logic gates • Do the analysis and 	✓	✓	✓	✓	✓	✓	?	?	?	?	✓	✓



Mapping of COs and Pos

		<p>design procedures for synchronous and asynchronous sequential circuits</p> <ul style="list-style-type: none"> • Use the semiconductor memories and related technology • Use electronic circuits involved in the design of logic gates 													
19152C35	Signals and Systems	<ul style="list-style-type: none"> • To be able to determine if a given system is linear/causal/stable • Capable of determining the frequency components present in a deterministic signal • Capable of characterizing LTI systems in the time domain and frequency 	✓	✓	✓	✓	✓	✓	?	?	?	?	✓	✓	



Mapping of COs and Pos

		domain • To be able to compute the output of an LTI system in the time and frequency domains													
19152C36	Electronic Circuits- I	<ul style="list-style-type: none"> Acquire knowledge of <ul style="list-style-type: none"> Working principles, characteristics and applications of BJT and FET Frequency response characteristics of BJT and FET amplifiers Analyze the performance of small signal BJT and FET amplifiers - single stage and multi stage amplifiers Apply the knowledge gained in the design of Electronic circuits 	✓	✓	✓	✓	✓	✓	?	?	?	?	✓	✓	
19152L37	Fundamentals	• To understand and	✓	✓	✓	✓	✓	✓	?	?	?	?	✓	✓	



Mapping of COs and Pos

	of Data Structures In C Laboratory	<p>implement basic data structures using C</p> <ul style="list-style-type: none"> • To apply linear and non-linear data structures in problem solving. • To learn to implement functions and recursive functions by means of data structures • To implement searching and sorting algorithms 													
19152L38	Analog and Digital Circuits Laboratory	<ul style="list-style-type: none"> • Design and Test rectifiers, filters and regulated power supplies. • Design and Test BJT/JFET amplifiers. • Differentiate cascode and cascade amplifiers. • Analyze the limitation in bandwidth of single stage and multi stage 	✓	✓	✓	✓	✓	✓	?	?	?	?	✓	✓	



Mapping of COs and Pos

		<p>amplifier</p> <ul style="list-style-type: none"> • Measure CMRR in differential amplifier • Simulate and analyze amplifier circuits using PSpice. • Design and Test the digital logic circuits. 													
19152L39	Interpersonal Skills / Listening & Speaking	<ul style="list-style-type: none"> • Equip students with the English language skills required for the successful undertaking of academic studies with primary emphasis on academic speaking and listening skills. • Provide guidance and practice in basic general and classroom conversation and to engage in specific academic speaking activities. • improve general and 	?	?	?	?	?	?	?	?	?	?	?	?	?



Mapping of COs and Pos

		academic listening skills • Make effective presentations.													
IV	19148S41B	Probability and Random Processes • Understand the fundamental knowledge of the concepts of probability and have knowledge of standard distributions which can describe real life phenomenon. • Understand the basic concepts of one and two dimensional random variables and apply in engineering applications. • Apply the concept random processes in engineering disciplines. • Understand and apply the concept of correlation and spectral densities.	✓	✓	✓	✓	✓	?	?	?	?	?	✓	✓	



Mapping of COs and Pos

		<ul style="list-style-type: none"> The students will have an exposure of various distribution functions and help in acquiring skills in handling situations involving more than one variable. Able to analyze the response of random inputs to linear time invariant systems. 												
19152C42	Electronic Circuits II	<ul style="list-style-type: none"> Analyze different types of amplifier, oscillator and multivibrator circuits Design BJT amplifier and oscillator circuits Analyze transistorized amplifier and oscillator circuits Design and analyze feedback amplifiers Design LC and RC oscillators, tuned 	✓	✓	✓	✓	✓	✓	?	?	?	?	✓	✓



School: ENGINEERING AND TECHNOLOGY

Dept: ECE- BTech (FT)

Mapping of COs and Pos

		amplifiers, wave shaping circuits, multivibrators, power amplifier and DC convertors.													
19152C43	Communication Theory	<ul style="list-style-type: none"> • Design AM communication systems • Design Angle modulated communication systems • Apply the concepts of Random Process to the design of Communication systems • Analyze the noise performance of AM and FM systems • Gain knowledge in sampling and quantization 	✓	✓	✓	✓	✓	✓	?	?	?	?	✓	✓	
19152C44	Electromagnetic Fields	<ul style="list-style-type: none"> • Display an understanding of fundamental electromagnetic laws 	✓	✓	✓	✓	✓	✓	?	?	?	?	✓	✓	



Mapping of COs and Pos

		<p>and concepts</p> <ul style="list-style-type: none"> • Write Maxwell's equations in integral, differential and phasor forms and explain their physical meaning • Explain electromagnetic wave propagation in lossy and in lossless media • Solve simple problems requiring estimation of electric and magnetic field quantities based on these concepts and laws 												
19152C45	Linear Integrated Circuits	<ul style="list-style-type: none"> • Design linear and non linear applications of OP – AMPS • Design applications using analog multiplier and PLL • Design ADC and DAC using OP – AMPS • Generate waveforms 	✓	✓	✓	✓	✓	✓	?	?	?	?	✓	✓



Mapping of COs and Pos

		using OP – AMP Circuits • Analyze special function lcs												
19149S46	Environmental Science and Engineering	One will obtain knowledge on the following after completing the course. • Public awareness of environmental is at infant stage. • Ignorance and incomplete knowledge has lead to misconceptions • Development and improvement in standard of living has lead to serious environmental disasters	✓	✓	?	✓	?	✓	✓	✓	?	?	✓	✓
19152L47	Circuits Design and Simulation Laboratory	• Analyze various types of feedback amplifiers • Design oscillators, tuned amplifiers, wave-	✓	✓	✓	✓	✓	✓	?	?	?	?	✓	✓



Mapping of COs and Pos

		shaping circuits and multivibrators • Design and simulate feedback amplifiers, oscillators, tuned amplifiers, wave-shaping circuits and multivibrators using SPICE Tool.													
19152L48	Linear Integrated Circuits Laboratory	• Design amplifiers, oscillators, D-A converters using operational amplifiers. • Design filters using op-amp and performs an experiment on frequency response. • Analyze the working of PLL and describe its application as a frequency multiplier. • Design DC power supply using ICs. • Analyze the	✓	✓	✓	✓	✓	✓	?	?	?	?	✓	✓	



Mapping of COs and Pos

		performance of filters, multivibrators, A/D converter and analog multiplier using SPICE.													
	19152CRS	<ul style="list-style-type: none"> • Exposure to various research domains • Acquaintance with languages of research • Development for research aptitude 	✓	✓	✓	✓	✓	✓	?	?	?	?	?	?	?
V	19152C51	<ul style="list-style-type: none"> • Design PCM systems • Design and implement base band transmission schemes • Design and implement band pass signaling schemes • Analyze the spectral characteristics of band pass signaling schemes and their noise performance • Design error control 	✓	✓	✓	✓	✓	✓	?	?	?	?	✓	✓	✓



Mapping of COs and Pos

			coding schemes												
	19152C52	Discrete-Time Signal Processing	<ul style="list-style-type: none"> Apply DFT for the analysis of digital signals and systems Design IIR and FIR filters Characterize the effects of finite precision representation on digital filters Design multirate filters Apply adaptive filters appropriately in communication systems 	✓	✓	✓	✓	✓	✓	?	?	?	?	✓	✓
	19152C53	Computer Architecture and Organization	<ul style="list-style-type: none"> Describe data representation, instruction formats and the operation of a digital computer Illustrate the fixed point and floating-point arithmetic for ALU operation 	✓	✓	✓	✓	✓	✓	?	?	?	?	✓	✓



Mapping of COs and Pos

		<ul style="list-style-type: none"> • Discuss about implementation schemes of control unit and pipeline performance • Explain the concept of various memories, interfacing and organization of multiple processors • Discuss parallel processing technique and unconventional architectures 													
191__FE54 -	Free Elective - I														
19150FE54 A	Database Management Systems	<ul style="list-style-type: none"> • Understand relational data model, evolve conceptual model of a given problem, its mapping to relational model and Normalization 	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓



Mapping of COs and Pos

		<ul style="list-style-type: none"> • Query the relational database and write programs with database connectivity • Understand the concepts of database security and information retrieval systems 													
19150FE54 B	Cloud Computing	<ul style="list-style-type: none"> • Articulate the main concepts, key technologies, strengths and limitations of cloud computing. • Learn the key and enabling technologies that help in the development of cloud. • Develop the ability to understand and use the architecture of compute and storage cloud, service and delivery models. • Explain the core issues 	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓



Mapping of COs and Pos

		<p>of cloud computing such as resource management and security.</p> <ul style="list-style-type: none"> • Be able to install and use current cloud technologies. • Choose the appropriate technologies, algorithms and approaches for implementation and use of cloud. 												
19153FE54 A	Industrial Nano Technology	<ul style="list-style-type: none"> • To possess knowledge on nanotechnology based applications in each industry • To provide details of contemporary industrial applications of nanotechnology • To provide an overview of future technological 	✓	✓	✓	✓	✓	✓	✓	✓	?	✓	✓	✓



Mapping of COs and Pos

		advancements and increasing role of nanotechnology in each industry													
19153FE54 B	Energy Conservation and Management	<ul style="list-style-type: none"> • Can carry out energy accounting and balancing • Can suggest methodologies for energy savings 	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	?	✓
19154FE54 A	Renewable Energy Sources	<ul style="list-style-type: none"> • Understanding the physics of solar radiation. • Ability to classify the solar energy collectors and methodologies of storing solar energy. • Knowledge in applying solar energy in a useful way. • Knowledge in wind energy and biomass with its economic aspects. 	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	?	✓



Mapping of COs and Pos

		<ul style="list-style-type: none"> • Knowledge in capturing and applying other forms of energy sources like wind, biogas and geothermal energies. 												
19154FE54 B	Automotive Systems	<ul style="list-style-type: none"> • Identify the different components in automobile engineering. • Have clear understanding on different auxiliary and transmission systems usual. 	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	☐
19155FE54 A	Air Pollution and Control Engineering	<ul style="list-style-type: none"> • An understanding of the nature and characteristics of air pollutants, noise pollution and basic concepts of air quality management • Ability to identify, formulate and solve air 	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓



Mapping of COs and Pos

		<p>and noise pollution problems</p> <ul style="list-style-type: none"> • Ability to design stacks and particulate air pollution control devices to meet applicable standards. • Ability to select control equipments. • Ability to ensure quality, control and preventive measures. 												
19155FE54 B	Geographic Information System	<ul style="list-style-type: none"> • Have basic idea about the fundamentals of GIS. • Understand the types of data models. • Get knowledge about data input and topology. • Gain knowledge on data quality and standards. • Understand data management functions 	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	?	✓



Mapping of COs and Pos

		and data output													
19152C55	Communication Networks	<ul style="list-style-type: none"> Identify the components required to build different types of networks Choose the required functionality at each layer for given application Identify solution for each functionality at each layer Trace the flow of information from one node to another node in the network 	✓	✓	✓	✓	✓	✓	?	?	?	?	✓	✓	
19152E56_	Elective - I														
19152E56B	Medical Electronics	<ul style="list-style-type: none"> Know the human body electro- physiological parameters and recording of bio-potentials 	✓	✓	?	?	?	✓	?	?	?	?	✓	✓	



PRIST
DEEMED TO BE
UNIVERSITY
NAAC ACCREDITED
THANJAVUR – 613 403 - TAMILNADU

School: ENGINEERING AND TECHNOLOGY

Dept: ECE- BTech (FT)

Mapping of COs and Pos

	<ul style="list-style-type: none">• Comprehend the non-electrical physiological parameters and their measurement – body temperature, blood pressure, pulse, blood cell count, blood flow meter etc.• Interpret the various assist devices used in the hospitals viz. pacemakers, defibrillators, dialyzers and ventilators• Comprehend physical medicine methods eg. ultrasonic, shortwave, microwave surgical diathermies , and bio-telemetry principles and methods• Know about recent trends in medical instrumentation													
--	---	--	--	--	--	--	--	--	--	--	--	--	--	--



Mapping of COs and Pos

19152E56E	Nano Technology and Applications	<ul style="list-style-type: none"> Describe the basic science behind the properties of materials. Interpret the creation, characterization, and manipulation of nanoscale materials. Comprehend the exciting applications of nanotechnology at the leading edge of scientific research Apply their knowledge of nanotechnology to identify how they can be exploited for new applications. 	✓	✓	✓	✓	✓	✓	✓	✓	✓	?	✓	✓	✓
19152E56G	Total Quality Management	<ul style="list-style-type: none"> The student would be able to apply the tools and techniques of quality management to manufacturing and services processes. 	?	?	?	?	?	✓	✓	✓	?	?	?	?	✓



Mapping of COs and Pos

19152E56H	Digital Audio Engineering	<ul style="list-style-type: none"> Analyze the type of dither. Analyze the recording and transmission principles in digital audio. Analyze the various compression techniques. Design and analyze the digital audio editing. Analyze the various application of digital audio. 	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	?	✓
19152E56I	Logic and Distributed Control Systems	<ul style="list-style-type: none"> Ability to understand and analyze Instrumentation systems and their applications to various industries. Ability to understand and analyse, linear and digital electronic 	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	?	✓



Mapping of COs and Pos

		circuits.													
19152L57	Discrete Time Signal Processing Laboratory	<ul style="list-style-type: none"> • Carryout basic signal processing operations • Demonstrate their abilities towards MATLAB based implementation of various DSP systems • Analyze the architecture of a DSP Processor • Design and Implement the FIR and IIR Filters in DSP Processor for performing filtering operation over real-time signals • Design a DSP system for various applications of DSP 	✓	✓	✓	✓	✓	✓	?	?	?	?	✓	✓	
19152L58	Communication Systems Laboratory	<ul style="list-style-type: none"> • Simulate & validate the various functional modules of a 	✓	✓	✓	✓	✓	✓	?	?	?	?	✓	✓	



Mapping of COs and Pos

		<p>communication system</p> <ul style="list-style-type: none"> • Demonstrate their knowledge in base band signaling schemes through implementation of digital modulation schemes • Apply various channel coding schemes & demonstrate their capabilities towards the improvement of the noise performance of communication system • Simulate end-to-end communication Link 													
19152L59	Communication Networks Laboratory	<ul style="list-style-type: none"> • Communicate between two desktop computers • Implement the different protocols • Program using sockets. • Implement and 	✓	✓	✓	✓	✓	✓	?	?	?	?	✓	✓	



Mapping of COs and Pos

		compare the various routing algorithms • Use the simulation tool.													
	19152CRM	Research Methodology • Understand the approaches towards and constraints in good research. Use the statistical tools used in research methodology • Compose the manuscript for publication • Obtain computational and excel- skills for research in engineering	✓	✓	✓	✓	✓	✓	✓	✓	?	?	?	?	
VI	19152C61	Microprocessors and Microcontrollers • Understand and execute programs based on 8086 microprocessor. • Design Memory Interfacing circuits. • Design and interface	✓	✓	✓	✓	✓	✓	?	?	?	?	✓	✓	



Mapping of COs and Pos

		<p>I/O circuits.</p> <ul style="list-style-type: none"> • Design and implement 8051 microcontroller based systems. 													
19152C62	VLSI Design	<ul style="list-style-type: none"> • Realize the concepts of digital building blocks using MOS transistor. • Design combinational MOS circuits and power strategies. • Design and construct Sequential Circuits and Timing systems. • Design arithmetic building blocks and memory subsystems. • Apply and implement FPGA design flow and testing. 	✓	✓	✓	✓	✓	✓	?	?	?	?	✓	✓	
19152C63	Wireless Communication	<ul style="list-style-type: none"> • Characterize a wireless channel and evolve the system design specifications 	✓	✓	✓	✓	✓	✓	?	?	?	?	✓	✓	



Mapping of COs and Pos

		<ul style="list-style-type: none"> • Design a cellular system based on resource availability and traffic demands • Identify suitable signaling and multipath mitigation techniques for the wireless channel and system under consideration. 													
19152C64	Principles of Management	<ul style="list-style-type: none"> • Upon completion of the course, students will be able to have clear understanding • Managerial functions like planning, organizing, staffing, leading & controlling and have same basic knowledge on international aspect of management 	?	?	?	?	?	✓	✓	✓	?	✓	✓	✓	
19152C65	Transmission	<ul style="list-style-type: none"> • Explain the 	✓	✓	✓	✓	✓	✓	?	?	?	?	✓	✓	



Mapping of COs and Pos

	Lines and RF Systems	<p>characteristics of transmission lines and its losses</p> <ul style="list-style-type: none"> • Write about the standing wave ratio and input impedance in high frequency transmission lines • Analyze impedance matching by stubs using smith charts • Analyze the characteristics of TE and TM waves • Design a RF transceiver system for wireless communication 													
19152E66_	Elective - II														
19152E66A	Cryptography and Network Security	<ul style="list-style-type: none"> • Understand the fundamentals of networks security, security architecture, threats and 	✓	✓	✓	✓	✓	✓	?	✓	✓	✓	?	✓	



Mapping of COs and Pos

		vulnerabilities <ul style="list-style-type: none"> • Apply the different cryptographic operations of symmetric cryptographic algorithms • Apply the different cryptographic operations of public key cryptography • Apply the various Authentication schemes to simulate different applications. • Understand various Security practices and System security standards 													
19152E66B	Advanced Digital Signal Processing	<ul style="list-style-type: none"> • Articulate and apply the concepts of special random processes in practical applications • Choose appropriate spectrum estimation 	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓



Mapping of COs and Pos

		<p>techniques for a given random process</p> <ul style="list-style-type: none"> • Apply optimum filters appropriately for a given communication application • Apply appropriate adaptive algorithm for processing non-stationary signals • Apply and analyse wavelet transforms for signal and image processing based applications 												
19152E66F	Wireless Networks	<ul style="list-style-type: none"> • Conversant with the latest 3G/4G networks and its architecture • Design and implement wireless network environment for any application using latest wireless protocols and standards 	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓



Mapping of COs and Pos

		<ul style="list-style-type: none"> • Ability to select the suitable network depending on the availability and requirement • Implement different type of applications for smart phones and mobile devices with latest network strategies 												
19152E66H	SCADA System and Applications Management	This course gives knowledge about various system components and communication protocols of SCADA system and its applications.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
19152E66I	Software Engineering	<ul style="list-style-type: none"> • Identify the key activities in managing a software project. • Compare different 	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓



Mapping of COs and Pos

		<p>process models.</p> <ul style="list-style-type: none"> • Concepts of requirements engineering and Analysis Modeling. • Apply systematic procedure for software design and deployment. • Compare and contrast the various testing and maintenance. • Manage project schedule, estimate project cost and effort required. 												
19152L61	Microprocessors and Microcontrollers Laboratory	<ul style="list-style-type: none"> • Write ALP Programmes for fixed and Floating Point and Arithmetic operations • Interface different I/Os with processor • Generate waveforms using Microprocessors • Execute Programs in 	✓	✓	✓	✓	✓	✓	?	?	?	?	✓	✓



Mapping of COs and Pos

		8051 <ul style="list-style-type: none"> Explain the difference between simulator and Emulator 													
19152L62	VLSI Design Laboratory	<ul style="list-style-type: none"> Write HDL code for basic as well as advanced digital integrated circuit Import the logic modules into FPGA Boards Synthesize Place and Route the digital IPs Design, Simulate and Extract the layouts of Digital & Analog IC Blocks using EDA tools 	✓	✓	✓	✓	✓	✓	?	?	?	?	✓	✓	
19152L63	Professional Communication	<ul style="list-style-type: none"> Make effective presentations Participate confidently in Group Discussions. Attend job interviews and be successful in 	?	?	?	?	?	✓	?	?	?	✓	?	✓	



Mapping of COs and Pos

		<p>them.</p> <ul style="list-style-type: none"> • Develop adequate Soft Skills required for the workplace 													
19152L64	Technical Seminar	<ul style="list-style-type: none"> • To study research papers for understanding of a new field, in the absence of a textbook, to summarise and review them • To identify promising new directions of various cutting edge technologies • To impart skills in preparing detailed report describing the project and results • To effectively communicate by making an oral presentation before an evaluation committee 	?	✓	?	✓	✓	✓	?	✓	✓	✓	✓	✓	



Mapping of COs and Pos

	19152CBR	Participation in Bounded Research	<ul style="list-style-type: none"> • Hands on exposure to problem solving tools in contemporary research • Evolve research intuitiveness and orientation • Familiarize with cutting edge research trends 	✓	✓	✓	✓	✓	✓	✓	✓	?	?	?	?
VII	19152C71	Antennas and Microwave Engineering	<ul style="list-style-type: none"> • Apply the basic principles and evaluate antenna parameters and link power budgets • Design and assess the performance of various antennas • Design a microwave system given the application specifications 	✓	✓	✓	✓	✓	✓	?	?	?	?	✓	✓
	19152C72	Optical Communication	<ul style="list-style-type: none"> • Realize basic elements in optical fibers, different modes and 	✓	✓	✓	✓	✓	✓	?	?	?	?	✓	✓



Mapping of COs and Pos

		<p>configurations.</p> <ul style="list-style-type: none"> Analyze the transmission characteristics associated with dispersion and polarization techniques. Design optical sources and detectors with their use in optical communication system. Construct fiber optic receiver systems, measurements and coupling techniques. Design optical communication systems and its networks. 													
19152C73	Embedded and Real Time Systems	<ul style="list-style-type: none"> Describe the architecture and programming of ARM processor Outline the concepts of embedded systems 	✓	✓	✓	✓	✓	✓	?	?	?	?	✓	✓	



Mapping of COs and Pos

		<ul style="list-style-type: none"> • Explain the basic concepts of real time operating system design • Model real-time applications using embedded-system concepts 													
191__FE74 -	Free Elective - II														
19150FE74 A	Introduction to C Programming	<ul style="list-style-type: none"> • Develop simple applications using basic constructs • Develop applications using arrays and strings • Develop applications using functions and structures 	✓	?	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
19150FE74 B	Data Structures and Algorithms	<ul style="list-style-type: none"> • Implement linear data structures and solve problems using them. • Implement and apply trees and graphs to solve problems. 	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓



Mapping of COs and Pos

		<ul style="list-style-type: none"> Implement the various searching and sorting algorithms. 													
19153FE74 A	Basic Circuit Theory	<ul style="list-style-type: none"> introduce electric circuits and its analysis impart knowledge on solving circuit equations using network theorems introduce the phenomenon of resonance in coupled circuits. introduce Phasor diagrams and analysis of three phase circuits 	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	☐	✓	
19153FE74 B	Introduction to Renewable Energy Systems	<ul style="list-style-type: none"> understand and analyze power system operation, stability, control and protection. handle the engineering aspects of electrical energy generation and 	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	☐	✓	



Mapping of COs and Pos

		utilization. • understand the stand alone and grid connected renewable energy systems. • design of power converters for renewable energy applications. • acquire knowledge on wind electrical generators and solar energy systems. • design power converters used for hybrid renewable energy systems.													
19154FE74 A	Industrial Safety	• identify and prevent chemical, environmental mechanical, fire hazard through analysis and apply proper safety techniques on safety engineering and	✓	?	✓	✓	✓	✓	✓	✓	✓	✓	✓	?	✓



Mapping of COs and Pos

		management.													
19154FE74 B	Testing of Materials	<ul style="list-style-type: none"> Identify suitable testing technique to inspect industrial component Use the different technique and know its applications and limitations 	✓	?	✓	✓	✓	✓	✓	✓	✓	✓	✓	?	✓
19155FE74 A	Green Building Design	<ul style="list-style-type: none"> Identify existing energy codes, green building codes and green rating systems. Identify and compare cost and performance of building materials with recycled components, non-petroleum based materials, materials with low volatile organic compounds, materials with low embodied energy and salvaged 	✓	?	✓	✓	✓	✓	✓	✓	✓	✓	✓	?	✓



Mapping of COs and Pos

		<p>materials and incorporate them into design.</p> <ul style="list-style-type: none"> • Identify and use construction materials and methods that more easily allow for salvage and re-use of building materials. • Understand the techniques and benefits of building performance testing, monitoring and metering. • Identify and make use of techniques for weatherization and sustainable remodeling of existing structures 												
19155FE74 B	Waste Water Treatment	<ul style="list-style-type: none"> • Will have knowledge about adsorption and oxidation process. • Will gain idea about various methods 	✓	?	✓	✓	✓	✓	✓	✓	✓	✓	?	✓



Mapping of COs and Pos

		<p>available for water treatment.</p> <ul style="list-style-type: none"> • Will appreciate the necessity of water and acquire knowledge of preliminary treatment. 												
19152C75	Adhoc and Wireless Sensor Networks	<ul style="list-style-type: none"> • Know the basics of Ad hoc networks and Wireless Sensor Networks • Apply this knowledge to identify the suitable routing algorithm based on the network and user requirement • Apply the knowledge to identify appropriate physical and MAC layer protocols • Understand the transport layer and security issues possible in Ad hoc and sensor networks. 	✓	✓	✓	✓	✓	✓	?	?	?	?	✓	✓



Mapping of COs and Pos

		<ul style="list-style-type: none"> Be familiar with the OS used in Wireless Sensor Networks and build basic modules 													
19152E76_	Elective - III														
19152E76A	Advanced Wireless Communication	<ul style="list-style-type: none"> Comprehend and appreciate the significance and role of this course in the present contemporary world Apply the knowledge about the importance of MIMO in today's communication Appreciate the various methods for improving the data rate of wireless communication system 	✓	✓	✓	?	✓	✓	✓	✓	✓	✓	✓	?	✓
19152E76B	Cognitive Radio	<ul style="list-style-type: none"> Gain knowledge on the design principles on software defined 	✓	✓	✓	?	✓	✓	✓	✓	✓	✓	✓	?	✓



Mapping of COs and Pos

		radio and cognitive radio • Develop the ability to design and implement algorithms for cognitive radio spectrum sensing and dynamic spectrum access • Build experiments and projects with real time wireless applications • Apply the knowledge of advanced features of cognitive radio for real world applications													
19152E76F	Mixed Signal IC Design	• Apply the concepts for mixed signal MOS circuit. • Analyze the characteristics of IC based CMOS filters. • Design of various	✓	?	✓	?	✓	✓	✓	✓	✓	✓	✓	?	✓



Mapping of COs and Pos

		<p>data converter architecture circuits.</p> <ul style="list-style-type: none"> Analyze the signal to noise ratio and modeling of mixed signals. Design of oscillators and phase lock loop circuit. 												
19152E76H	Space Time Wireless Communication	<ul style="list-style-type: none"> Design and analyze the channel characterization. Analyze the capacity of random MIMO channel. Design and analyze the order diversity and channel variability. Analyze the multiple antenna coding and receivers. Analyze the MIMO multi user detection 	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	☐	✓



Mapping of COs and Pos

19152E76I	Telecommunication Network Management	<ul style="list-style-type: none"> • Design and analyze of fault management. • Analyze the common management information protocol specifications. • Design and analyze of management information model. • Design the simple network management protocol. • Design the various types of network management tools. 	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	?	✓
19152L77	Embedded Laboratory	<ul style="list-style-type: none"> • Write programs in ARM for a specific Application • Interface memory, A/D and D/A convertors with ARM system • Analyze the performance of 	✓	✓	✓	✓	✓	?	?	?	?	?	✓	✓		



Mapping of COs and Pos

		<p>interrupt</p> <ul style="list-style-type: none"> • Write program for interfacing keyboard, display, motor and sensor. • Formulate a mini project using embedded system 												
19152L78	Advanced Communication Laboratory	<ul style="list-style-type: none"> • Analyze the performance of simple optical link by measurement of losses and Analyzing the mode characteristics of fiber • Analyze the Eye Pattern, Pulse broadening of optical fiber and the impact on BER • Estimate the Wireless Channel Characteristics and Analyze the performance of 	✓	✓	✓	✓	✓	✓	?	?	?	?	✓	✓



Mapping of COs and Pos

		Wireless Communication System • Understand the intricacies in Microwave System design														
	19152CSR	Design/Socio Technical Project • Sensitive to social needs for innovation • Develop teams and work towards interdisciplinary synchronous research strategy • Develop critical thinking and synergistic research approach.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
VIII	19152E81_	Elective – IV														
	19152E81A	Electro Magnetic Interference and Compatibility • Identify the various types and mechanisms of Electromagnetic Interference • Propose a suitable EMI mitigation technique	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	☐	✓



Mapping of COs and Pos

		Describe the various EMC Standards and methods to measure them												
19152E81E	Digital Image Processing	<ul style="list-style-type: none"> • Know and understand the basics and fundamentals of digital image processing, such as digitization, sampling, quantization, and 2D-transforms. • Operate on images using the techniques of smoothing, sharpening and enhancement. • Understand the restoration concepts and filtering techniques. • Learn the basics of segmentation, features extraction, compression and 	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	☐	✓



Mapping of COs and Pos

		recognition methods for color models.												
19152E81F	Professional Ethics in Engineering	<ul style="list-style-type: none"> to apply ethics in society, discuss the ethical issues related to engineering and realize the responsibilities and rights in the society. 	?	?	?	?	✓	✓	✓	✓	✓	✓	?	✓
19152E81G	Telecommunication System Modeling and Simulation	<ul style="list-style-type: none"> Apply the constituents of a telecommunication systems. Analyze various modeling methodologies and simulation techniques. Estimate the performance measures of telecommunication systems. Apply system modeling in telecommunication. 	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	?	✓



Mapping of COs and Pos

		<ul style="list-style-type: none"> • Demonstrate light wave communication and satellite communication systems. 												
19152E81H	Transducer Engineering	<ul style="list-style-type: none"> • to model and analyze transducers. 	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	?	✓
19152E82_	Elective – V													
19152E82B	DSP Architecture and Programming	<ul style="list-style-type: none"> • Analyze the concepts of Digital Signal Processors • Demonstrate their ability to program the DSP processor for signal processing applications • Discuss, compare and select the suitable Advanced DSP Processors for real-time signal processing applications 	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	?	✓



Mapping of COs and Pos

19152E82C	Satellite Communication	<ul style="list-style-type: none"> Analyze the satellite orbits Analyze the earth segment and space segment Analyze the satellite Link design Design various satellite applications 	✓	✓	✓	✓	✓	✓	✓	✓	✓	?	✓
19152E82F	Fundamentals of Nano Science	<ul style="list-style-type: none"> Will familiarize about the science of nanomaterials Will demonstrate the preparation of nanomaterials Will develop knowledge in characteristic nanomaterial 	✓	✓	✓	✓	✓	✓	✓	✓	✓	?	✓
19152E82G	Environmental and Social Impact Assessment	<ul style="list-style-type: none"> carry out scoping and screening of developmental projects for 	✓	✓	✓	✓	✓	✓	✓	✓	✓	?	✓



Mapping of COs and Pos

		<p>environmental and social assessments</p> <ul style="list-style-type: none"> • explain different methodologies for environmental impact prediction and assessment • plan environmental impact assessments and environmental management plans • evaluate environmental impact assessment reports 											
19152E82H	Telehealth Technology	<ul style="list-style-type: none"> • Apply multimedia technologies in telemedicine. • Explain Protocols behind encryption techniques for secure transmission of data. • Apply telehealth in healthcare. 	✓	✓	✓	✓	✓	✓	✓	✓	✓	?	✓



Mapping of COs and Pos

	19152P83	Project Work	<ul style="list-style-type: none"> • apply fundamental and disciplinary concepts and methods in ways appropriate to their principal area of study. • demonstrate skill and knowledge of current information and technological tools and techniques specific to the professional field of study. • use effectively oral, written and visual communication. • identify, analyze, and solve problems creatively through sustained critical investigation. • integrate information from multiple sources. • demonstrate an awareness and 	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
--	----------	--------------	--	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---



Mapping of COs and Pos

		application of appropriate personal, societal, and professional ethical standards. • practice the skills, diligence, and commitment to excellence needed to engage in lifelong learning.												
19152PEE	Programme Exit Examination	• The students will be confident in discussing the fundamental aspects of any engineering problem/situation and give answers in dealing with them	✓	✓	✓	✓								✓

2019 regulation- UG (PT)

Sem	Course Code	Title of the Course	COs	POS
-----	-------------	---------------------	-----	-----



Mapping of COs and Pos

			PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
I	19148S11BP	Transforms and Partial Differential Equations	<ul style="list-style-type: none"> • Be capable of mathematically formulating certain practical problems in terms of partial differential equations, solve them and physically interpret the results. • Have gained a well founded knowledge of Fourier series, their different possible forms and 	✓	✓	✓	✓	✓					✓	✓
	19152H12P	Electromagnetic Theory	<ul style="list-style-type: none"> • analyze fields a potentials due to static changes • evaluate static magnetic fields • understand how materials affect electric and magnetic fields • understand the relation between 	✓	✓	✓	✓	✓	✓				✓	✓



School: ENGINEERING AND TECHNOLOGY

Dept: ECE- BTech (FT)

Mapping of COs and Pos

		the fields under time varying situations • understand principles of prop												
19152H13P	Digital Electronics	<ul style="list-style-type: none"> • introduce number systems and codes • introduce basic postulates of Boolean algebra and shows the correlation between Boolean expressions • introduce the methods for simplifying Boolean expressions • outline the formal procedures for the analysis and des 	✓	✓	✓	✓	✓	✓					✓	✓
19152H14P	Electronic Circuits - I	<ul style="list-style-type: none"> • The methods of biasing transistors • Design of simple amplifier circuits • Mid – band analysis of 	✓	✓	✓	✓	✓	✓					✓	✓



Mapping of COs and Pos

		<p>amplifier circuits using small - signal equivalent circuits to determine gain input impedance and output impedance</p> <ul style="list-style-type: none"> • Method of calculating cutoff fre 												
19152H15P	Signals and Systems	<ul style="list-style-type: none"> • To study the properties and representation of discrete and continuous signals. • To study the sampling process and analysis of discrete systems using z-transforms. • To study the analysis and synthesis of discrete time systems. • To study the properties 	✓	✓	✓	✓	✓	✓					✓	✓



Mapping of COs and Pos

II	19148S21P	Numerical Methods	<ul style="list-style-type: none"> • The roots of nonlinear (algebraic or transcendental) equations, solutions of large system of linear equations and eigenvalue problem of a matrix can be obtained numerically where analytical methods fail to give solution. • When huge amounts of experimen 	✓	✓	✓	✓	✓						✓	✓
	19152S22P	Electrical Engineering and Control Systems	<ul style="list-style-type: none"> • To understand the operation of Electrical machines and transformers • To understand the open loop and closed loop (feedback) systems • To understand 	✓	✓	✓	✓	✓	✓					✓	✓



School: ENGINEERING AND TECHNOLOGY

Dept: ECE- BTech (FT)

Mapping of COs and Pos

		time domain and frequency domain analysis of control systems required for stability analysis. • To unde													
19152H23P	Linear Integrated Circuits	<ul style="list-style-type: none"> • To introduce the basic building blocks of linear integrated circuits. • To teach the linear and non-linear applications of operational amplifiers. • To introduce the theory and applications of analog multipliers and PLL. • To teach the theory of ADC and 	✓	✓	✓	✓	✓	✓						✓	✓
19152H24P	Electronic Circuits - II	<ul style="list-style-type: none"> • The advantages and method of analysis of feed back amplifiers • Analysis and design of RC and 	✓	✓	✓	✓	✓	✓						✓	✓



Mapping of COs and Pos

		LC oscillators, tuned amplifiers, wave shaping circuits, multivibrators, blocking oscillators and time based generators. • The advantages and method of analysis												
19152H25P	Transmission Lines and Waveguides	• To become familiar with propagation of signals through lines • Understand signal propagation at Radio frequencies • Understand radio propagation in guided systems • To become familiar with resonators • To become familiar with propagation of sig	✓	✓	✓	✓	✓	✓					✓	✓



Mapping of COs and Pos

III	19148S31BP	Probability and Random Processes	<ul style="list-style-type: none"> • Have a fundamental knowledge of the basic probability concepts. • Have a well – founded knowledge of standard distributions which can describe real life phenomena. • Acquire skills in handling situations involving more than one random variable and funct 	✓	✓	✓	✓	✓						✓	✓
	19152H32P	Microprocessor Interfacing and Applications	<ul style="list-style-type: none"> • To introduce the architecture and programming of 8085 microprocessor. • To introduce the interfacing of peripheral devices with 8085 microprocessor. • To introduce the architecture and 	✓	✓	✓	✓	✓	✓					✓	✓



School: ENGINEERING AND TECHNOLOGY

Dept: ECE- BTech (FT)

Mapping of COs and Pos

		<p>programming of 8086 microprocessor.</p> <ul style="list-style-type: none"> • To introduce the applications, 													
19152H33P	Digital Signal Processing	<ul style="list-style-type: none"> • To study DFT and its computation • To study the design techniques for digital filters • To study the finite word length effects in signal processing • To study the non-parametric methods of power spectrum estimations • To study the fundamentals of digit 	✓	✓	✓	✓	✓	✓						✓	✓
19152H34P	Communication Theory	<ul style="list-style-type: none"> • To provide various Amplitude modulation and demodulation systems. • To provide various Angle 	✓	✓	✓	✓	✓	✓						✓	✓



Mapping of COs and Pos

		<p>modulation and demodulation systems.</p> <ul style="list-style-type: none"> • To provide some depth analysis in noise performance of various receiver. • To study some basic information theory with so 												
19152L35P	Digital Signal Processing and Microprocessor Lab	<ul style="list-style-type: none"> • Carryout basic signal processing operations • Design and Implement the FIR and IIR Filters in DSP Processor for performing filtering operation over real-time signals • Interface different I/Os with processor • Generate waveforms using Microprocessors • 	✓	✓	✓	✓	✓	✓					✓	✓



Mapping of COs and Pos

IV	19152H41P	Digital Communication	<ul style="list-style-type: none"> To study pulse modulation and discuss the process of sampling, quantization and coding that are fundamental to the digital transmission of analog signals. To learn baseband pulse transmission, which deals with the transmission of pulse-amplitude, modu 	✓	✓	✓	✓	✓	✓										✓	✓
	19152H42P	Antenna and Wave Propagation	<ul style="list-style-type: none"> To study radiation from a current element. To study antenna arrays To study aperture antennas To learn special antennas such as frequency independent and broad band antennas. 	✓	✓	✓	✓	✓	✓										✓	✓



School: ENGINEERING AND TECHNOLOGY

Dept: ECE- BTech (FT)

Mapping of COs and Pos

		<ul style="list-style-type: none"> • To study radio wave propagation. • To study radiation from a current e 													
19152H43P	Computer Networks	<ul style="list-style-type: none"> • To introduce the students the functions of different layers. • To introduce IEEE standard employed in computer networking. • To make students to get familiarized with different protocols and network components. • To introduce the students the functions o 	✓	✓	✓	✓	✓	✓						✓	✓
191_E44_P	Elective-I														
19152E44AP	High Speed Networks	<ul style="list-style-type: none"> • Students will get an introduction about ATM and Frame relay. 	✓	✓	✓	✓	✓	✓						✓	✓



Mapping of COs and Pos

		<ul style="list-style-type: none"> • Students will be provided with an up-to-date survey of developments in High Speed Networks. • Enable the students to know techniques involved to support real-time traffic and congestion cont 												
19152E44BP	Advanced Digital Signal Processing	<ul style="list-style-type: none"> • To study the parametric methods for power spectrum estimation. • To study adaptive filtering techniques using LMS algorithm and to study the applications of adaptive filtering. • To study multirate signal processing fundamentals. • To study the 	✓	✓	✓	✓	✓	✓					✓	✓



School: ENGINEERING AND TECHNOLOGY

Dept: ECE- BTech (FT)

Mapping of COs and Pos

		analysis												
19152E44CP	Speech Processing	<ul style="list-style-type: none"> To introduce the models for speech production To develop time and frequency domain techniques for estimating speech parameters To introduce a predictive technique for speech compression To understand speech recognition, synthesis and speaker ident 	✓	✓	✓	✓	✓	✓						✓
19152E44DP	Fuzzy Logic and Neural Networks	<ul style="list-style-type: none"> To introduce the ideas of fuzzy sets, fuzzy logic and use of heuristics based on human experience To become familiar with neural networks 	✓	✓	✓	✓	✓	✓						✓



School: ENGINEERING AND TECHNOLOGY

Dept: ECE- BTech (FT)

Mapping of COs and Pos

		that can learn from available examples and generalize to form appropriate rules for inferencing systems • To prov												
19152E44FP	Digital Audio Engineering	<ul style="list-style-type: none"> Analyze the type of dither. Analyze the recording and transmission principles in digital audio. Analyze the various compression techniques. Design and analyze the digital audio editing. Analyze the various application of digital audio. Analyze 	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
19152L45P	Networks and Communication Lab	<ul style="list-style-type: none"> Communicate between two desktop computers• 	✓	✓	✓	✓	✓	✓					✓	✓



Mapping of COs and Pos

			<p>Implement the different protocols• Implement and compare the various routing algorithms• Use the simulation tool• Simulate & validate the various functional modules of a communication system• Apply variou</p>											
V	19152H51P	Optical Communication and Networks	<ul style="list-style-type: none"> • To learn the basic elements of optical fiber transmission link, fiber modes configurations and structures. • To understand the different kind of losses, signal distortion in optical wave guides and other signal degradation factors. Design 	✓	✓	✓	✓	✓	✓				✓	✓



School: ENGINEERING AND TECHNOLOGY

Dept: ECE- BTech (FT)

Mapping of COs and Pos

		optimization o												
19152H52P	Microwave Engineering	<ul style="list-style-type: none"> • To study passive microwave components and their S-Parameters. • To study Microwave semiconductor devices & applications. • To study Microwave sources and amplifiers. • To study passive microwave components and their S-Parameters. • T 	✓	✓	✓	✓	✓	✓					✓	✓
19152H53P	VLSI Design	<ul style="list-style-type: none"> • To learn the basic CMOS circuits. • To learn the CMOS process technology. • To learn 	✓	✓	✓	✓	✓	✓					✓	✓



School: ENGINEERING AND TECHNOLOGY

Dept: ECE- BTech (FT)

Mapping of COs and Pos

		<p>techniques of chip design using programmable devices.</p> <ul style="list-style-type: none"> • To learn the concepts of designing VLSI subsystems. • To learn the concepts of modeling a digital system using H 												
191__E54_P	Elective II													
19149E54AP	Environmental Science and Engineering	<ul style="list-style-type: none"> • Public awareness of environmental is at infant stage. • Ignorance and incomplete knowledge has lead to misconceptions • Development and improvement in standard of living has lead to serious environmental disasters • Public 	✓	✓		✓		✓	✓	✓			✓	✓



School: ENGINEERING AND TECHNOLOGY

Dept: ECE- BTech (FT)

Mapping of COs and Pos

		awareness of environmental is a													
19152E54BP	Optoelectronic Devices	<ul style="list-style-type: none"> To know the basics of solid state physics and understand the nature and characteristics of light. To understand different methods of luminescence, display devices and laser types and their applications. To learn the principle of optical detection me 	✓	✓	✓	✓	✓	✓					✓	✓	
19152E54DP	Digital Image Processing	<ul style="list-style-type: none"> To study the image fundamentals and mathematical transforms necessary for image processing. To study the image enhancement techniques 	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	



School: ENGINEERING AND TECHNOLOGY

Dept: ECE- BTech (FT)

Mapping of COs and Pos

		<ul style="list-style-type: none"> • To study image restoration procedures. • To study the image compression procedures. • To study the image segmentati 													
19152E54EP	Engineering Acoustics	<ul style="list-style-type: none"> • To provide mathematical basis for acoustics waves • To introduce the concept of radiation reception absorption and attenuation of acoustic waves. • To present the characteristic behaviour of sound in pipes, resonators and filters. • To introduce the pro 	✓	✓	✓	✓	✓	✓						✓	✓
19152E54FP	Software Engineering	<ul style="list-style-type: none"> • Identify the key activities in managing a 	✓	✓	✓	✓	✓	✓	✓	✓				✓	✓



Mapping of COs and Pos

		<p>software project.</p> <ul style="list-style-type: none"> • Compare different process models. • Concepts of requirements engineering and Analysis Modeling. • Apply systematic procedure for software design and deployment. • Compare and contrast the 												
19152L55P	Optical Communication and Microwave Lab	<ul style="list-style-type: none"> • Analyze the performance of simple optical link. • Test microwave and optical components. • Analyse the mode characteristics of fiber • Analyse the radiation of pattern of antenna. • Analyze 	✓	✓	✓	✓	✓	✓					✓	✓



Mapping of COs and Pos

			the performance of simple optical link. • Test microwave and op															
VI	19152H61P	Mobile and Wireless Communication	• It deals with the fundamental cellular radio concepts such as frequency reuse and handoff. This also demonstrates the principle of trunking efficiency and how trunking and interference issues between mobile and base stations combine to affect the overall	✓	✓	✓	✓	✓	✓								✓	✓
	19152H62P	Medical Electronics	• To study the methods of recording various biopotentials • To study how to measure biochemical and various physiological information	✓	✓	✓	✓	✓									✓	✓



School: ENGINEERING AND TECHNOLOGY

Dept: ECE- BTech (FT)

Mapping of COs and Pos

		<ul style="list-style-type: none"> • To understand the working of units which will help to restore normal functioning • To understand the use of radiation f 													
19152H63P	Micro Controller and Embedded systems	<ul style="list-style-type: none"> • To study 8051 architecture • To write assembly language programming • To study the embedded architecture and real time applications. • To study 8051 architecture • To write assembly language programming • To study the embedded architecture and real time 	✓	✓	✓	✓	✓	✓						✓	✓



Mapping of COs and Pos

191_E64_P		Elective III													
19160E64AP	Principles Of Management	<ul style="list-style-type: none"> • Upon completion of the course, students will be able to have clear understanding • Managerial functions like planning, organizing, staffing, leading & controlling and have same basic knowledge on international aspect of management • Upon completion of t 							✓	✓	✓		✓	✓	✓
19152E64BP	Satellite Communication	<ul style="list-style-type: none"> • Overview of satellite systems in relation to other terrestrial systems. • Study of satellite orbits and launching. • Study of earth segment and space 	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓



School: ENGINEERING AND TECHNOLOGY

Dept: ECE- BTech (FT)

Mapping of COs and Pos

		segment components <ul style="list-style-type: none"> • Study of satellite access by various users. • Study of DTH and compression standar 												
19152E64CP	Robotics	<ul style="list-style-type: none"> • The course has been so designed to give the students an overall view of the mechanical components and mathematics associated with the same. • Actuators and sensors necessary for the functioning of the robot. • The course has been so designed to give the 	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓
19152E64DP	Remote sensing	<ul style="list-style-type: none"> • Principles of Remote Sensing and GIS • Analysis of RS and GIS data and 	✓	✓	✓	✓	✓	✓					✓	✓



Mapping of COs and Pos

		<p>interpreting the data for modeling applications</p> <ul style="list-style-type: none"> • Principles of Remote Sensing and GIS • Analysis of RS and GIS data and interpreting the data for modeling applications 													
19150E64FP	Transducer Engineering	<ul style="list-style-type: none"> • to model and analyze transducers 	✓	✓	✓	✓	✓	✓						✓	✓
19152L65P	VLSI and Embedded systems Lab	<ul style="list-style-type: none"> • Write HDL code for basic as well as advanced digital integrated circuit • Import the logic modules into FPGA Boards • Synthesize Place and Route the digital IPs • Write programs in ARM for a specific Application • Interface memory, A/D and 	✓	✓	✓	✓	✓	✓						✓	✓



School: ENGINEERING AND TECHNOLOGY

Dept: ECE- BTech (FT)

Mapping of COs and Pos

			D/A convertor													
VII	19160S71P	Total Quality Management	<ul style="list-style-type: none"> The student would be able to apply the tools and techniques of quality management to manufacturing and services processes. 							✓	✓	✓		✓	✓	✓
	19152H72P	Wireless Networks	<ul style="list-style-type: none"> To understand physical as wireless MAC layer alternatives techniques. To learn planning and operation of wireless networks. To study various wireless LAN and WAN concepts. To understand WPAN and geo-location systems. 	✓	✓	✓	✓	✓							✓	✓
	19152H73P	Telecommunication Switching and Networks	<ul style="list-style-type: none"> To introduce the concepts of Frequency and Time division 	✓	✓	✓	✓	✓							✓	✓



Mapping of COs and Pos

		<p>multiplexing.</p> <ul style="list-style-type: none"> • To introduce digital multiplexing and digital hierarchy namely SONET / SDH • To introduce the concepts of space switching, time switching and combination switching, example of a sw 													
191__E74_P	Elective IV														
19152E74AP	Power Electronics	<ul style="list-style-type: none"> • To study about power electronic circuits for voltage and current control and protection. • To learn the switching characteristics of transistors and SCRs. Series and parallel functions of SCRs, Programmable 	✓	✓	✓	✓	✓	✓						✓	✓



Mapping of COs and Pos

		<ul style="list-style-type: none"> triggering methods of SCR. • To learn controll 													
19152E74BP	Advanced Microprocessors	<ul style="list-style-type: none"> • To introduce the concepts in internal programming model of Intel family of microprocessors. • To introduce the programming techniques using MASM, DOS and BIOS function calls. • To introduce the basic architecture of Pentium family of processors. • To in 	✓	✓	✓	✓	✓	✓						✓	✓
19152E74CP	Electromagnetic Interference and Compatibility	<ul style="list-style-type: none"> • To understand EMI Sources, EMI problems and their solution methods in PCB level / Subsystem and system level design. • To measure the 	✓	✓	✓	✓	✓	✓						✓	✓



Mapping of COs and Pos

		emission. immunity level from different systems to couple with the prescribed EMC standards													
19152E74DP	Solid State Electronic Drives	<ul style="list-style-type: none"> • To learn crystal structures of elements used for fabrication of semiconductor devices. • To study energy band structure of semiconductor devices. • To understand fermi levels, movement of charge carriers, Diffusion current and Drift current. • To study 	✓	✓	✓	✓	✓	✓						✓	✓
19152E74FP	Space Time Wireless Communication	<ul style="list-style-type: none"> • Design and analyze the channel characterization. • Analyze the capacity of 	✓	✓	✓	✓	✓	✓						✓	✓



Mapping of COs and Pos

		<p>random MIMO channel.</p> <ul style="list-style-type: none"> • Design and analyze the order diversity and channel variability. • Analyze the multiple antenna coding and receivers. • Analyze the MIMO multi user detectio 												
19152P75P	Project Work & Viva Voce	<ul style="list-style-type: none"> • apply fundamental and disciplinary concepts and methods in ways appropriate to their principal area of study. • demonstrate skill and knowledge of current information and technological tools and 	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓



PRIST
 DEEMED TO BE
UNIVERSITY
 NAAC ACCREDITED
 THANJAVUR – 613 403 - TAMILNADU

School: ENGINEERING AND TECHNOLOGY

Dept: ECE- BTech (FT)

Mapping of COs and Pos

		techniques specific to the professional field of study. •																	
--	--	---	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

DEPARTMENT OF MECHANICAL ENGINEERING

COURSE OBJECTIVE B.TECH(F.T) (R-2019)

Course Code	Course Name	Course Outcomes
19147S11	Communicative English	<ul style="list-style-type: none">• Read articles of a general kind in magazines and newspapers.• Participate effectively in informal conversations; introduce themselves.• Their friends and express opinions in English.• Comprehend conversations and short talks delivered in English• Write short essays of a general kind and personal letters and emails in English.
19148S12	Engineering Mathematics - I	<ul style="list-style-type: none">• Use both the limit definition and rules of differentiation to differentiate functions.• Apply differentiation to solve maxima and minima problems.• Evaluate integrals both by using Riemann sums and by using the Fundamental Theorem of Calculus.• Apply integration to compute multiple integrals, area, volume, integrals in polar coordinates, in addition to change of order and change of variables.• Evaluate integrals using techniques of integration, such as substitution, partial fractions and integration by parts.
19149S13	Engineering Physics	<ul style="list-style-type: none">• The students will gain knowledge on the basics of properties of matter and its applications,• The students will acquire knowledge on the concepts of waves and optical devices and their applications in fibre optics,• The students will have adequate knowledge on the concepts of thermal properties of materials and their applications in expansion joints and heat exchangers,• The students will get knowledge on advanced physics concepts of quantum theory and its applications in tunneling microscopes, and• The students will understand the basics of crystals, their structures and different crystal growth techniques.
19149S14	Engineering Chemistry	<ul style="list-style-type: none">• The knowledge gained on engineering materials, fuels, energy sources and water treatment• Techniques will facilitate better understanding of engineering processes and applications for further learning

LOCAL NEEDS

REGIONAL NEEDS

NATIONAL NEEDS

GLOBAL NEEDS

		<ul style="list-style-type: none"> the students will acquire knowledge on Fe-Fe₃C phase diagram, various microstructures and alloys the students will get knowledge on mechanical properties of materials and their measurement the students will gain knowledge on magnetic, dielectric and superconducting properties of materials.
19150S16	Problem Solving And Python Programming	<ul style="list-style-type: none"> Develop algorithmic solutions to simple computational problems Read, write, execute by hand simple Python programs. Structure simple Python programs for solving problems. Decompose a Python program into functions. Represent compound data using Python lists, tuples, dictionaries..
19154S15	Engineering Graphics	<ul style="list-style-type: none"> Familiarize with the fundamentals and standards of Engineering graphics Perform freehand sketching of basic geometrical constructions and multiple views of objects. Project orthographic projections of lines and plane surfaces. Draw projections and solids and development of surfaces. Visualize and to project isometric and perspective sections of simple solids.
19150L17	Problem Solving Andpython Programming Lab	<ul style="list-style-type: none"> Write, test, and debug simple Python programs. Implement Python programs with conditionals and loops. Develop Python programs step-wise by defining functions and calling them. Use Python lists, tuples, dictionaries for representing compound data. Read and write data from/to files in Python.
19149L18	Physics And Chemistry Lab	<ul style="list-style-type: none"> Upon completion of the course, the students will be able to apply principles of elasticity, optics and thermal properties for engineering applications The students will be outfitted with hands-on knowledge in the quantitative chemical analysis of water quality related parameters.

LOCAL NEEDS

REGIONAL NEEDS

NATIONAL NEEDS

GLOBAL NEEDS

191VEA19	Value Education	<ul style="list-style-type: none"> • To learn about philosophy of Life and individual qualities • To learn and practice social values and responsibilities • To learn and practice mind culture, forces acting on the body • To learn more of Responsibilities and Rights as Professional and facing Global Challenges • Emerge as responsible citizen with clear conviction to be a role-model in the society.
19147S21	Technical English	<ul style="list-style-type: none"> • Read technical texts and write area- specific texts effortlessly. • Listen and comprehend lectures and talks in their area of specialisation successfully. • Speak appropriately and effectively in varied formal and informal contexts. • Write reports and winning job applications. • the students will understand the basics of ceramics, composites and nanomaterials
19148S22A	Engineering Mathematics– Ii	<ul style="list-style-type: none"> • Eigenvalues and eigenvectors, diagonalization of a matrix, Symmetric matrices, Positive definite matrices and similar matrices. • Gradient, divergence and curl of a vector point function and related identities. • Evaluation of line, surface and volume integrals using Gauss, Stokes and Green's theorems and their verification. • Analytic functions, conformal mapping and complex integration. • Laplace transform and inverse transform of simple functions, properties, various related theorems and application to differential equations with constant coefficients.
19149S23C	Materials Science	<ul style="list-style-type: none"> • the students will have knowledge on the various phase diagrams and their applications • the students will acquire knowledge on Fe-Fe₃C phase diagram, various microstructures and alloys • the students will get knowledge on mechanical properties of materials and their measurement • the students will gain knowledge on magnetic, dielectric and superconducting properties of materials • the students will understand the basics of ceramics, composites and nanomaterials.
19149S24A	Environmental Science And Engineering	<ul style="list-style-type: none"> ○ Environmental Pollution or problems cannot be solved by mere laws. Public participation is an important aspect which serves the

LOCAL NEEDS

REGIONAL NEEDS

NATIONAL NEEDS

GLOBAL NEEDS

		<p>environmental Protection.</p> <ul style="list-style-type: none"> ○ One will obtain knowledge on the following after completing the course. ○ Public awareness of environmental is at infant stage. ○ Ignorance and incomplete knowledge has lead to misconceptions ○ Development and improvement in std. of living has lead to serious environmental disasters
19153S25D	Basic Electrical, Electronics And Instrumentation	<ul style="list-style-type: none"> ▪ Understand electric circuits and working principles of electrical machines ▪ Understand the concepts of various electronic devices ▪ Choose appropriate instruments for electrical measurement for a specific application ▪ calculate dynamic forces exerted in rigid body ▪ determine the friction and the effects by the laws of friction
19154S26D	Engineering Mechanics	<ul style="list-style-type: none"> ▪ illustrate the vectorial and scalar representation of forces and moments ▪ analyse the rigid body in equilibrium ▪ evaluate the properties of surfaces and solids ▪ calculate dynamic forces exerted in rigid body ▪ determine the friction and the effects by the laws of friction
19154L27	Engineering Practices Lab	<ul style="list-style-type: none"> • Fabricate carpentry components and pipe connections including plumbing works. • Use welding equipments to join the structures. • Carry out the basic machining operations • Make the models using sheet metal works • Illustrate on centrifugal pump, Air conditioner, operations of smithy, foundary and fittings
19153L28D	Basic Electrical, Electronics And Instrumentation Engineering Laboratory	<ul style="list-style-type: none"> • Ability to determine the speed characteristic of different electrical machines • Ability to design simple circuits involving diodes and transistors • Ability to use operational amplifiers • Measure the electrical quantities • Elaborate on the components, gates, soldering practices.
191ICA29	Fundamentals Of Indian Constitution And Economy	<ul style="list-style-type: none"> • Understand the emergence and evolution of Indian Constitution. • Understand the structure and composition of Indian Constitution • Understand and analyse federalism in the Indian context. • Understand and analyse the three organs of the state in the contemporary scenario. • Understand and Evaluate the Indian Political scenario amidst the emerging challenges.

LOCAL NEEDS

REGIONAL NEEDS

NATIONAL NEEDS

GLOBAL NEEDS

19148S31C	Transforms And Partial Differential Equations	<ul style="list-style-type: none"> ○ Understand how to solve the given standard partial differential equations. ○ Solve differential equations using Fourier series analysis which plays a vital role in engineering applications. ○ Appreciate the physical significance of Fourier series techniques in solving one and two dimensional heat flow problems and one dimensional wave equations. ○ Understand the mathematical principles on transforms and partial differential equations would provide them the ability to formulate and solve some of the physical problems of engineering. ○ Use the effective mathematical tools for the solutions of partial differential equations by using Z transform techniques for discrete time systems.
19154C32	Engineering Thermodynamics	<ul style="list-style-type: none"> ▪ Apply the first law of thermodynamics for simple open and closed systems under steady and unsteady conditions. ▪ Apply second law of thermodynamics to open and closed systems and calculate entropy and availability. ▪ Apply Rankine cycle to steam power plant and compare few cycle improvement methods ○ Use sheet metal fabrication tools and make simple tray and funnel ▪ Use different moulding tools, patterns and prepare sand moulds.
19152C33	Fluid Mechanics And Machinery	<ul style="list-style-type: none"> ○ Apply mathematical knowledge to predict the properties and characteristics of a fluid. ○ Can analyse and calculate major and minor losses associated with pipe flow in piping networks. ○ Can mathematically predict the nature of physical quantities ○ Can critically analyse the performance of pumps ○ Can critically analyse the performance of turbines.
19152C34	Production Technology – I	<ul style="list-style-type: none"> ○ Explain different metal casting processes, associated defects, merits and demerits ○ Compare different metal joining processes. ○ Summarize various hot working and cold working methods of metals. ○ Distinguish various methods of manufacturing plastic components • manufacturing processes.
19152C35	Electrical Drives And Controls	<ul style="list-style-type: none"> ○ Upon Completion of this subject, the students can able to explain different types of electrical

LOCAL NEEDS

REGIONAL NEEDS

NATIONAL NEEDS

GLOBAL NEEDS

		<ul style="list-style-type: none"> machines and their performance • sawing and broaching machines. • Explain the types of grinding and other super finishing processes apart from gear • Electrical machining processes. ○ Summarize numerical control of machine tools and write a part program.
19154L36	Production Technology Laboratory – I	<ul style="list-style-type: none"> ○ Demonstrate the safety precautions exercised in the mechanical workshop. ○ Make the workpiece as per given shape and size using Lathe. ○ Use sheet metal fabrication tools and make simple tray and funnel ○ Use different moulding tools, patterns and prepare sand moulds.
19154L37	Computer Aided Machine Drawing	<ul style="list-style-type: none"> • Ability to perform speed characteristic of different machine drawing ○ Understand the concepts of stress and strain in simple and compound bars, the importance of principal stresses and principal planes. ○ Understand the load transferring mechanism in beams and stress distribution due to shear.
19154L38	Electrical Engineering Laboratory	<ul style="list-style-type: none"> • Ability to perform speed characteristic of different electrical machine • sawing and broaching machines. • Explain the types of grinding and other super finishing processes apart from gear • Electrical machining processes.
19152L39	Interpersonal Skills / Listening & Speaking	<ul style="list-style-type: none"> ○ Equip students with the English language skills required for the successful undertaking of academic studies with primary emphasis on academic speaking and listening skills • Make effective presentations.
19148C41D	Statistics And Numerical Methods	<ul style="list-style-type: none"> ○ Apply the concept of testing of hypothesis for small and large samples in real life problems. ○ Apply the basic concepts of classifications of design of experiments in the field of agriculture. ○ Appreciate the numerical techniques of interpolation in various intervals and apply the numerical techniques of differentiation and integration for engineering problems. ○ Understand the knowledge of various techniques and methods for solving first and second order ordinary differential equations.
19152C42	Theory Of Machines-I	<ul style="list-style-type: none"> ○ Discuss the basics of mechanism ○ Calculate velocity and acceleration in simple mechanisms ○ Develop CAM profiles

LOCAL NEEDS

REGIONAL NEEDS

NATIONAL NEEDS

GLOBAL NEEDS

		<ul style="list-style-type: none"> ○ Examine friction in machine elements ○ Analyze and design thin and thick shells for the applied internal and external pressures.
19154C43	Production Technology – ii	<ul style="list-style-type: none"> ● Explain the mechanism of material removal processes. ● Describe the constructional and operational features of centre lathe and other special purpose lathes. ● Describe the constructional and operational features of shaper, planner, milling, drilling, sawing and broaching machines. ● Explain the types of grinding and other super finishing processes apart from gear ● Summarize numerical control of machine tools and write a part program.
19152C44	Engineering Metallurgy	<ul style="list-style-type: none"> ○ Explain alloys and phase diagram, Iron-Iron carbon diagram and steel classification ○ Explain isothermal transformation, continuous cooling diagrams and different heat treatment processes. ○ Clarify the effect of alloying elements on ferrous and non-ferrous metals ○ Summarize the properties and applications of non metallic materials. ○ Explain the testing of mechanical properties.
19152C45	Strength Of Materials For Mechanical Engineers	<ul style="list-style-type: none"> ○ Understand the concepts of stress and strain in simple and compound bars, the importance of principal stresses and principal planes. ○ Understand the load transferring mechanism in beams and stress distribution due to shearing force and bending moment. ○ Apply basic equation of simple torsion in designing of shafts and helical spring ○ Calculate the slope and deflection in beams using different methods. ○ Analyze and design thin and thick shells for the applied internal and external pressures.
19149S46	Thermal Engineering - I	<ul style="list-style-type: none"> ○ Apply thermodynamic concepts to different air standard cycles and solve problems. ○ Solve problems in single stage and multistage air compressors ○ Explain the functioning and features of IC engines, components and auxiliaries. ○ Explain the flow in Gas turbines and solve problems ○ Analyze and design thin and thick shells for the applied internal and external pressures.
19152L47	Production Technology Laboratory	<ul style="list-style-type: none"> ○ use different machine tools to manufacturing gears ○ Ability to use different machine tools to

LOCAL NEEDS

REGIONAL NEEDS

NATIONAL NEEDS

GLOBAL NEEDS

	- II	<ul style="list-style-type: none"> ○ manufacturing gears ○ Ability to use different machine tools for finishing operations ○ Ability to manufacture tools using cutter grinder ○ Develop CNC part programming
19152L48	Strength Of Materials And Fluid Mechanics And Machinery Laboratory	<ul style="list-style-type: none"> ○ Ability to perform Tension, Torsion, Hardness, Compression, and Deformation test on Solid materials. Perform Tension, Torsion, Hardness, Compression, and Deformation test on Solid materials. ○ Use the measurement equipments for flow measurement. ● Perform test on different fluid machinery
19154L 49	Advanced Reading And Writing	<ul style="list-style-type: none"> ● Write winning job applications. ● Read and evaluate texts critically. ● Display critical thinking in various professional contexts
19152C51	Thermal Engineering – II	<ul style="list-style-type: none"> ○ Solve problems in Steam Nozzle ● Explain the functioning and features of different types of Boilers and auxiliaries and ○ calculate performance parameters. ● Explain the flow in steam turbines, draw velocity diagrams for steam turbines and solve problems ● Summarize the concept of Cogeneration, Working features of Heat pumps and HeatExchangers
19152C52	Design Of Machine Elements	<ul style="list-style-type: none"> ● Explain the influence of steady and variable stresses in machine component design. ● Apply the concepts of design to temporary and permanent joints. ● Apply the concepts of design to energy absorbing members, connecting rod and crank shaft. ● apply the concepts of design to worm and bevel gears. ● apply the concepts of design to cams, brakes and clutches
19152C53	Metrology And Measurements	<ul style="list-style-type: none"> ○ Describe the concepts of measurements to apply in various metrological instruments ○ Analyze and design thin and thick shells for the applied internal and external pressures. ○ Outline the principles of linear and angular measurement tools used for industrial Applications ○ Explain the procedure for conducting computer aided inspection ○ Discuss various measuring techniques of mechanical properties in industrial applications
19154C54	Theory Of Machines-II	<ul style="list-style-type: none"> ○ Calculate static and dynamic forces of mechanisms ○ Analyze and design thin and thick shells for the applied internal and external pressures. ○ Calculate the balancing masses and their locations of reciprocating and rotating masses. ○ Compute the frequency of forced vibration and

LOCAL NEEDS

REGIONAL NEEDS

NATIONAL NEEDS

GLOBAL NEEDS

		<ul style="list-style-type: none"> ○ damping coefficient. ○ Calculate the speed and lift of the governor and estimate the gyroscopic effect on automobiles, ships and airplanes
19154L56	Theory Of Machines Laboratory	<ul style="list-style-type: none"> ● Explain gear parameters, kinematics of mechanisms, gyroscopic effect and working of lab equipments. ● Determine mass moment of inertia of mechanical element, governor effort and range sensitivity, natural frequency and damping coefficient, torsional frequency, critical speeds ● shafts, balancing mass of rotating and reciprocating masses, and transmissibility ratio. ● conduct tests to evaluate the performance of parallel/counter flow heat exchanger ● apparatus and reciprocating air compressor.
19152L57	Thermal Engineering Laboratory	<ul style="list-style-type: none"> ● conduct tests on heat conduction apparatus and evaluate thermal conductivity of materials. ● conduct tests on natural and forced convective heat transfer apparatus and evaluate heat transfer coefficient. ● conduct tests to evaluate the performance of parallel/counter flow heat exchanger ● apparatus and reciprocating air compressor. ● conduct tests to evaluate the performance of refrigeration and airconditioning test rigs
19152L58	Metrology And Measurements Laboratory	<ul style="list-style-type: none"> ● Measure the gear tooth dimensions, angle using sine bar, straightness and flatness, thread parameters, temperature using thermocouple, force, displacement, torque and vibration. ● Calibrate the vernier, micrometer and slip gauges and setting up the comparator for the inspection. ●
19152CRM	Research Methodology	<ul style="list-style-type: none"> ● Understand the approaches towards and constraints in good research. Use the statistical tools used in research methodology ● Compose the manuscript for publication ● Obtain computational and excel- skills for research in engineering
19152C61	Design Of Transmission Systems	<ul style="list-style-type: none"> ○ apply the concepts of design to belts, chains and rope drives. ○ apply the concepts of design to spur, helical gears. ○ apply the concepts of design to worm and bevel gears. ○ apply the concepts of design to cams, brakes and clutches ● Apply the concepts of design to temporary and permanent joints.
19152C62	Computer Aided Design And Manufacturing	<ul style="list-style-type: none"> ○ Explain the 2D and 3D transformations, clipping algorithm, Manufacturing models and Metrics ○ Explain the fundamentals of parametric curves, surfaces and Solids ○ Apply NC & CNC programming concepts to

LOCAL NEEDS

REGIONAL NEEDS

NATIONAL NEEDS

GLOBAL NEEDS

		<ul style="list-style-type: none"> ○ develop part programme for Lathe & Milling Machines ○ Summarize the different types of techniques used in Cellular Manufacturing and FMS ○ Demonstrate manual part programming with G and M codes using CAM
19152C63	Heat And Mass Transfer	<ul style="list-style-type: none"> ● Apply heat conduction equations to different surface configurations under steady state and transient conditions and solve problems ● Explain the phenomena of boiling and condensation, apply LMTD and NTU methods of thermal analysis to different types of heat exchanger configurations and solve problems ● Apply diffusive and convective mass transfer equations and correlations to solve problems for different applications ● Explain the flow in steam turbines, draw velocity diagrams for steam turbines and solve problems ● Summarize the concept of Cogeneration, Working features of Heat pumps and HeatExchangers
19152S64	Finite Element Analysis	<ul style="list-style-type: none"> ○ Summarize the basics of finite element formulation. ○ Apply finite element formulations to solve one dimensional Problems. ○ Apply finite element formulations to solve two dimensional scalar Problems. ○ Apply finite element method to solve two dimensional Vector problems. ○ Apply finite element method to solve problems on iso parametric element and dynamic Problems.
19152C65	Hydraulics And Pneumatics	<ul style="list-style-type: none"> ○ Explain the Fluid power and operation of different types of pumps. ○ Summarize the features and functions of Hydraulic motors, actuators and Flow control Valves ○ Explain the different types of Hydraulic circuits and systems ○ Explain the working of different pneumatic circuits and systems ○ Summarize the various trouble shooting methods and applications of hydraulic and pneumatic systems.
19152L67	Cad / Cam Laboratory	<ul style="list-style-type: none"> ○ Draw 3D and Assembly drawing using CAD software ○ Demonstrate manual part programming with G and M codes using CAM
19154L68	Design And Fabrication Project	<ul style="list-style-type: none"> ○ design and Fabricate the machine element or the mechanical product. ○ demonstrate the working model of the machine element or the mechanical product.
19154L69	Professional Communication	<ul style="list-style-type: none"> ● Make effective presentations ● Participate confidently in Group Discussions.

LOCAL NEEDS

REGIONAL NEEDS

NATIONAL NEEDS

GLOBAL NEEDS

		<ul style="list-style-type: none"> Attend job interviews and be successful in them. Develop adequate Soft Skills required for the workplace
19152CBR	Participation In Bounded Research	<ul style="list-style-type: none"> Hands on exposure to problem solving tools in contemporary research Evolve research intuitiveness and orientation Familiarize with cutting edge research trends
19152C71	Power Plant Engineering	<ul style="list-style-type: none"> Explain the layout, construction and working of the components inside a thermal power plant. Explain the layout, construction and working of the components inside a Diesel, Gas and Combined cycle power plants. Explain the layout, construction and working of the components inside nuclear power plants. Explain the layout, construction and working of the components inside Renewable energy power plants. Explain the applications of power plants while extend their knowledge to power plant economics and environmental hazards and estimate the costs of electrical energy production.
19152C72	Process Planning And Cost Estimation	<ul style="list-style-type: none"> select the process, equipment and tools for various industrial products. prepare process planning activity chart. explain the concept of cost estimation. compute the job order cost for different type of shop floor. calculate the machining time for various machining operations.
19152C73	Mechatronics	<ul style="list-style-type: none"> Discuss the interdisciplinary applications of Electronics, Electrical, Mechanical and Computer Systems for the Control of Mechanical, Electronic Systems and sensor technology. Discuss the architecture of Microprocessor and Microcontroller, Pin Diagram, Addressing Modes of Microprocessor and Microcontroller. Discuss Programmable Peripheral Interface, Architecture of 8255 PPI, and various device Interfacing
19154L77	Simulation And Analysis Laboratory	<ul style="list-style-type: none"> simulate the working principle of air conditioning system, hydraulic and pneumatic cylinder and cam follower mechanisms using MATLAB. analyze the stresses and strains induced in plates, brackets and beams and heat transfer problems. calculate the natural frequency and mode shape analysis of 2D components and beams. Explain the architecture, programming and application of programmable logic controllers
19152L78	Mechatronics Laboratory	<ul style="list-style-type: none"> Demonstrate the functioning of mechatronics system with various pneumatic, hydraulic

LOCAL NEEDS

REGIONAL NEEDS

NATIONAL NEEDS

GLOBAL NEEDS

		<ul style="list-style-type: none"> ○ and electrical systems. ○ Demonstrate the functioning of control systems with the help of PLC and microcontrollers. ○ to problems and challenges in the areas of Mechatronic engineering. ○ Discuss various Actuators and Mechatronics system using the knowledge and skills
19152CSR	Design/Socio Technical Project	<ul style="list-style-type: none"> ● Sensitive to social needs for innovation ● Develop teams and work towards interdisciplinary synchronous research strategy ● Develop critical thinking and synergistic research approach.
19152P83	Project Work	<ul style="list-style-type: none"> ● apply fundamental and disciplinary concepts and methods in ways appropriate to their principal area of study. ● demonstrate skill and knowledge of current information and technological tools and techniques specific to the professional field of study.
19152COMS	Comps	<ul style="list-style-type: none"> ● The students will be confident in discussing the fundamental aspects of any engineering problem/situation and give answers in dealing with them
19152E56A	Automobile Engineering	<ul style="list-style-type: none"> ○ recognize the various parts of the automobile and their functions and materials. ○ discuss the engine auxiliary systems and engine emission control. ○ distinguish the working of different types of transmission systems. ○ explain the Steering, Brakes and Suspension Systems. ○ predict possible alternate sources of energy for IC Engines.
19154E66B	Welding Technology	<ul style="list-style-type: none"> ○ Understand the construction and working principles of gas and arc welding process. ○ Understand the construction and working principles of resistance welding process. ○ Understand the construction and working principles of various solid state welding process. ○ Understand the construction and working principles of various special welding processes. ○ Understand the concepts on weld joint design, weldability and testing of weldments.
19154E66C	Gas Dynamics And Jet Propulsion	<ul style="list-style-type: none"> ○ Apply the concept of compressible flows in constant area ducts. ○ examine the effect of compression and expansion waves in compressible flow. ○ use the concept of gas dynamics in Jet Propulsion. ○ apply the concept of gas dynamics in Space Propulsion.

LOCAL NEEDS

REGIONAL NEEDS

NATIONAL NEEDS

GLOBAL NEEDS

		<ul style="list-style-type: none"> ○ acquired through the course and also from the given case studies
19154E66D	Intellectual Property Rights	<ul style="list-style-type: none"> ○ Ability to manage Intellectual Property portfolio to enhance the value of the firm ○ Summarize the concept of Quality and Process control for variables ○ Apply the process control for attributes ○ Explain the concept of sampling and to solve problems ○ Explain the concept of Life testing
19154E66E	Fundamentals Of Nanoscience	<ul style="list-style-type: none"> ● Will familiarize about the science of nanomaterials ● Will demonstrate the preparation of nanomaterials ● Will develop knowledge in characteristic nanomaterial ○ Understand the construction and working principles of various special welding processes. ● Understand the concepts on weld joint design, weldability and testing of weldments.
19154E74A	Refrigeration And Air Conditioning	<ul style="list-style-type: none"> ○ Explain the basic concepts of Refrigeration ○ Explain the Vapor compression Refrigeration systems and to solve problems ○ Discuss the various types of Refrigeration systems ○ Calculate the Psychrometric properties and its use in psychrometric processes ○ Explain the concepts of Air conditioning and to solve problems
19154E74B	Renewable Sources Of Energy	<ul style="list-style-type: none"> ○ Discuss the importance and Economics of renewable Energy ○ Discuss the method of power generation from Solar Energy ○ Discuss the method of power generation from Wind Energy ○ Explain the method of power generation from Bio Energy ○ Explain the Tidal energy, Wave Energy, OTEC, Hydro energy, Geothermal Energy, Fuel Cells and Hybrid Systems.
19154E74C	Quality Control And Reliability Engineering	<ul style="list-style-type: none"> ○ Summarize the concept of Quality and Process control for variables ○ Apply the process control for attributes ○ Explain the concept of sampling and to solve problems ○ Explain the concept of Life testing ○ Explain the concept Reliability and techniques involved
19154E74D	Unconventional Machining Processes	<ul style="list-style-type: none"> ○ Explain the need for unconventional machining processes and its classification ○ Compare various thermal energy and electrical energy based unconventional

LOCAL NEEDS

REGIONAL NEEDS

NATIONAL NEEDS

GLOBAL NEEDS

		<ul style="list-style-type: none"> machining processes. ○ Summarize various chemical and electro-chemical energy based unconventional machining processes. ○ Explain various nano abrasives based unconventional machining processes. ○ Distinguish various recent trends based unconventional machining processes.
19154E74E	Operations Research	<ul style="list-style-type: none"> ○ Upon completion of this course, the students can able to use the optimization techniques for use engineering and Business problems
19154E74F	Additive Manufacturing	<ul style="list-style-type: none"> ○ On completion of this course, students will learn about a working principle ○ construction of Additive Manufacturing technologies, their potential to support design and manufacturing. ○ modern development in additive manufacturing process and case studies relevant to mass customized manufacturing ○ Examine the implementation of robots in various industrial sectors and interpolate the economic analysis of robots. ○ Analyze Flow field problems
19154E74G	Total Quality Management	<ul style="list-style-type: none"> ○ The student would be able to apply the tools and techniques of quality management to manufacturing and services processes ○ Apply the process control for attributes ○ Explain the concept of sampling and to solve problems ○ Explain the concept of Life testing ○ Explain the concept Reliability and techniques involved
19154E76A	Robotics	<ul style="list-style-type: none"> ○ Explain the concepts of industrial robots, classification, specifications and coordinate systems. Also summarize the need and application of robots in different sectors. ○ Illustrate the different types of robot drive systems as well as robot end effectors. ○ Apply the different sensors and image processing techniques in robotics to improve the ability of robots. ○ Develop robotic programs for different tasks and familiarize with the kinematics motions of robot.
19154E76B	Design Of Jigs, Fixtures And Press Tools	<ul style="list-style-type: none"> ○ Summarize the different methods of Locating Jigs and Fixtures and Clamping principles ○ Design and develop jigs and fixtures for given component ○ Discuss the press working terminologies and elements of cutting dies ○ Distinguish between Bending and Drawing dies. ○ Discuss the different types of forming techniques

LOCAL NEEDS

REGIONAL NEEDS

NATIONAL NEEDS

GLOBAL NEEDS

19154E76C	Computational Fluid Dynamics	<ul style="list-style-type: none"> ○ Derive the governing equations and boundary conditions for Fluid dynamics ○ Analyze Finite difference and Finite volume methods for Diffusion ○ Analyze Finite volume method for Convective diffusion ○ Analyze Flow field problems ○ Explain and solve the Turbulence models and Mesh generation techniques
19154E76D	Non Destructive Testing And Evaluation	<ul style="list-style-type: none"> ○ Explain the fundamental concepts of NDT ○ Discuss the different methods of NDE ○ Explain the concept of Thermography and Eddy current testing ○ Explain the concept of Ultrasonic Testing and Acoustic Emission ○ Explain the concept of Radiography
19154E76E	Composite Materials And Mechanics	<ul style="list-style-type: none"> ○ Summarize the various types of Fibers, Equations and manufacturing methods for Composite materials ○ Derive Flat plate Laminate equations ○ Analyze Lamina strength ○ Analyze the thermal behavior of Composite laminates ○ Analyze Laminate flat plates
19154E76F	Human Rights	<ul style="list-style-type: none"> ● Engineering students will acquire the basic knowledge of human rights ○ Explain the concept of sampling and to solve problems ○ Explain the concept of Life testing ● Explain the concept Reliability and techniques involved ○ Discuss the press working terminologies and elements of cutting dies
19154E76G	Disaster Management	<ul style="list-style-type: none"> ● 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. ● Draw the hazard and vulnerability profile of India, Scenarios in the Indian context, Disaster damage assessment and management.
19154E82A	Production Planning And Control	<ul style="list-style-type: none"> ▪ Upon completion of this course, the students can able to prepare production planning and control activities ▪ work study, product planning, production scheduling, Inventory Control. ▪ They can plan manufacturing requirements manufacturing requirement Planning (MRP II) and Enterprise Resource Planning (ERP). ○ Compare various thermal energy and electrical energy based unconventional

LOCAL NEEDS

REGIONAL NEEDS

NATIONAL NEEDS

GLOBAL NEEDS

		<ul style="list-style-type: none"> ▪ machining processes. ▪ Summarize various chemical and electro-chemical energy based unconventional machining processes
19154E82B	Entrepreneurship Development	<ul style="list-style-type: none"> • 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. • Draw the hazard and vulnerability profile of India, Scenarios in the Indian context • Disaster damage assessment and management. ○ Classification of robots used in industrial applications
19154E82C	Computer Integrated Manufacturing Systems	<ul style="list-style-type: none"> ○ Explain the basic concepts of CAD, CAM and computer integrated manufacturing Systems ○ Summarize the production planning and control and computerized process planning ○ Differentiate the different coding systems used in group technology ○ Explain the concepts of flexible manufacturing system (FMS) ○ automated guided vehicle (AGV) system
19154E82D	Vibration And Noise Control	<ul style="list-style-type: none"> ○ Summarize the Basics of Vibration ○ Summarize the Basics of Noise ○ Explain the Sources of Automotive Noise ○ Discuss the Control techniques for vibration ○ Describe the sources and control of Noise
19154E82E	Micro Electro Mechanical Systems	<ul style="list-style-type: none"> • Ability to understand and apply basic science, circuit theory • Electro-magnetic field theory control theory and apply them to electrical engineering problems. ○ Ability to understand and analyse, linear and digital electronic circuits ○ Choose the appropriate technologies, algorithms and approaches for implementation and use of cloud.
19154E82F	Professional Ethics In Engineering	<ul style="list-style-type: none"> • 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 ○ Explain the concept of sampling and to solve problems ○ Explain the concept of Life testing ○ Explain the concept Reliability and techniques involved
19150OE54	Database Management	<ul style="list-style-type: none"> • Understand relational data model, evolve

LOCAL NEEDS

REGIONAL NEEDS

NATIONAL NEEDS

GLOBAL NEEDS

A	Systems	<ul style="list-style-type: none"> conceptual model of a given problem, its mapping to relational model and Normalization Query the relational database and write programs with database connectivity Understand the concepts of database security and information retrieval systems Be able to install and use current cloud technologies. Knowledge in capturing and applying other forms of energy sources like wind, biogas and geothermal energies.
19150OE54B	Cloud Computing	<ul style="list-style-type: none"> Articulate the main concepts, key technologies, strengths and limitations of cloud computing. Learn the key and enabling technologies that help in the development of cloud. Develop the ability to understand and use the architecture of compute and storage cloud, service and delivery models. Explain the core issues of cloud computing such as resource management and security.
19153OE54 A	Industrial Nano Technology	<ul style="list-style-type: none"> To possess knowledge on nanotechnology based applications in each industry To provide details of contemporary industrial applications of nanotechnology To provide an overview of future technological advancements and increasing role of nanotechnology in each industry Ability to select control equipments. Ability to ensure quality, control and preventive measures.
19153OE54B	Energy Conservation And Management	<ul style="list-style-type: none"> Can carry out energy accounting and balancing Can suggest methodologies for energy savings Ability to understand the stand alone and grid connected renewable energy systems. Ability to design of power converters for renewable energy applications. Ability to acquire knowledge on wind electrical generators and solar energy systems.
19154OE54 A	Renewable Energy Sources	<ul style="list-style-type: none"> Understanding the physics of solar radiation. Ability to classify the solar energy collectors and methodologies of storing solar energy. Knowledge in applying solar energy in a useful way. Knowledge in wind energy and biomass with its economic aspects. Knowledge in capturing and applying other forms

LOCAL NEEDS

REGIONAL NEEDS

NATIONAL NEEDS

GLOBAL NEEDS

		<ul style="list-style-type: none"> • or energy sources like wind, biogas and geothermal energies.
19154OE54B	Automotive Systems	<ul style="list-style-type: none"> • Identify the different components in automobile engineering. • Have clear understanding on different auxiliary and transmission systems usual. • distinguish the working of different types of transmission systems. • explain the Steering, Brakes and Suspension Systems. • discuss the engine auxiliary systems and engine emission control.
19155OE54	Air Pollution And Control Engineering	<ul style="list-style-type: none"> • An understanding of the nature and characteristics of air pollutants, noise pollution and basic concepts of air quality management • Ability to identify, formulate and solve air and noise pollution problems • Ability to design stacks and particulate air pollution control devices to meet applicable standards. • Ability to select control equipments. • Ability to ensure quality, control and preventive measures.
19155OE54B	Geographic Information System	<ul style="list-style-type: none"> • Have basic idea about the fundamentals of GIS. • Understand the types of data models. • Get knowledge about data input and topology. • Gain knowledge on data quality and standards. • Understand data management functions and data output
19150OE74 A	Introduction To C Programming	<ul style="list-style-type: none"> • Develop simple applications using basic constructs • Develop applications using arrays and strings • Write, test, and debug simple Python programs. • Implement Python programs with conditionals and loops. • Develop Python programs step-wise by defining functions and calling them.
19150OE74B	Data Structures And Algorithms	<ul style="list-style-type: none"> • Implement linear data structures and solve problems using them. • Implement and apply trees and graphs to solve problems. • Implement the various searching and sorting algorithms. • Use Python lists, tuples, dictionaries for representing compound data. • Read and write data from/to files in Python.

LOCAL NEEDS

REGIONAL NEEDS

NATIONAL NEEDS

GLOBAL NEEDS

19153OE74 A	Basic Circuit Theory	<ul style="list-style-type: none"> • Ability to introduce electric circuits and its analysis • Ability to impart knowledge on solving circuit equations using network theorems • Ability to introduce the phenomenon of resonance in coupled circuits. • Ability to introduce Phasor diagrams and analysis of three phase circuits
19153OE74B	Introduction To Renewable Energy Systems	<ul style="list-style-type: none"> • Ability to understand and analyze power system operation, stability, control and protection. • Ability to handle the engineering aspects of electrical energy generation and utilization. • Ability to understand the stand alone and grid connected renewable energy systems. • Ability to design of power converters for renewable energy applications. • Ability to acquire knowledge on wind electrical generators and solar energy systems. • Ability to design power converters used for hybrid renewable energy systems.
19154OE74 A	Industrial Safety	<ul style="list-style-type: none"> • identify and prevent chemical, environmental mechanical, fire hazard through analysis • Apply proper safety techniques on safety engineering and management. ○ Explain the layout, construction and working of the components inside a thermal power plant. ○ Explain the layout, construction and working of the components inside a Diesel, Gas and Combined cycle power plants.
19154OE74B	Testing Of Materials	<ul style="list-style-type: none"> • Identify suitable testing technique to inspect industrial component • Ability to use the different technique and know its applications and limitations ○ Explain the concept of Life testing • Explain the concept Reliability and techniques involved • Discuss the press working terminologies and elements of cutting dies
19155OE74 A	Green Building Design	<ul style="list-style-type: none"> • Identify existing energy codes, green building codes and green rating systems. • Identify and compare cost and performance of building materials with recycled components, non-petroleum based materials, materials with low volatile organic compounds, materials with low embodied energy and salvaged materials and incorporate them into design. • Identify and use construction materials and methods that more easily allow for salvage and

LOCAL NEEDS

REGIONAL NEEDS

NATIONAL NEEDS

GLOBAL NEEDS

		<ul style="list-style-type: none"> • re-use of building materials. • Understand the techniques and benefits of building performance testing, monitoring and metering. • Identify and make use of techniques for weatherization and sustainable remodeling of existing structures
19155OE74B	Waste Water Treatment	<ul style="list-style-type: none"> • Will have knowledge about adsorption and oxidation process. • Will gain idea about various methods available for water treatment. • Will appreciate the necessity of water and acquire knowledge of preliminary treatment. • Ability to design stacks and particulate air pollution control devices to meet applicable standards. • Ability to select control equipments.

LOCAL NEEDS

REGIONAL NEEDS

NATIONAL NEEDS

GLOBAL NEEDS

DEPARTMENT OF MECHANICAL ENGINEERING

COURSE OBJECTIVE B.TECH(P.T)(R-2019)

Course code	Course name	Course outcomes
19148S11P	Transforms & Partial Differential Equations	<ul style="list-style-type: none"> • Solve differential equations using Fourier series analysis which plays a vital role in engineering applications. • Be capable of mathematically formulating certain practical problems in terms of partial differential equations, solve them and physically interpret the results. • Have gained a well founded knowledge of Fourier series, their different possible forms and the frequently needed practical harmonic analysis that an engineer may have to make from discrete data. • Have obtained capacity to formulate and identify certain boundary value problems encountered in engineering practices, decide on applicability of the Fourier series method of solution, solve them and interpret the results. • Have grasped the concept of expression of a function, under certain conditions, as a double integral leading to identification of transform pair, and specialization on Fourier transform pair, their properties, the possible special cases with attention to their applications.
19154C12P	Electrical drives and controls	<ul style="list-style-type: none"> • Upon Completion of this subject, the students can able to explain different types of electrical machines and their performance • Explain the working principle and applications of electrical machines • Analyze the characteristics of analog electronic devices • Explain the basic concepts of digital electronics • Explain the operating principles of measuring instruments
19154C13P	Engineering Thermodynamics	<ul style="list-style-type: none"> • Apply the first law of thermodynamics for simple open and closed systems under steady unsteady conditions. • Apply second law of thermodynamics to open and closed systems • calculate entropy and availability. • Apply Rankine cycle to steam power plant and compare few cycle improvement methods
19154C14P	Fluid Mechanics and Machinery	<ul style="list-style-type: none"> • Apply mathematical knowledge to predict the properties and characteristics of a fluid.

LOCAL NEEDS

REGIONAL NEEDS

NATIONAL NEEDS

GLOBAL NEEDS

		<ul style="list-style-type: none"> • Can analyse and calculate major and minor losses associated with pipe flow in piping networks. • Can mathematically predict the nature of physical quantities • Can critically analyse the performance of pumps • Can critically analyse the performance of turbines.
19154C15P	Foundry And Welding Technology	<ul style="list-style-type: none"> • Explain different metal casting processes, associated defects, merits and demerits • Compare different metal joining processes. • Summarize various hot working and cold working methods of metals. • Explain various sheet metal making processes. • Distinguish various methods of manufacturing plastic components.
19148S21P	Numerical Methods	<ul style="list-style-type: none"> • The roots of nonlinear (algebraic or transcendental) equations, solutions of large system of linear equations and eigenvalue problem of a matrix can be obtained numerically where analytical methods fail to give solution. • When huge amounts of experimental data are involved, the methods discussed on interpolation will be useful in constructing approximate polynomial to represent the data and to find the intermediate values. • The numerical differentiation and integration find application when the function in the analytical form is too complicated or the huge amounts of data are given such as series of measurements, observations or some other empirical information. • Since many physical laws are couched in terms of rate of change of one/two or more independent variables, most of the engineering problems are characterized in the form of either nonlinear ordinary differential equations or partial differential equations. The methods introduced in the solution of ordinary differential equations and partial differential equations will be useful in attempting any engineering problem.
19154C22P	Machine Tool Technology	<ul style="list-style-type: none"> • Explain the mechanism of material removal processes. • Describe the constructional and operational features of centre lathe and other special purpose lathes. • Describe the constructional and operational features of shaper, planner, milling, drilling,

LOCAL NEEDS

REGIONAL NEEDS

NATIONAL NEEDS

GLOBAL NEEDS

		<ul style="list-style-type: none"> • sawing and broaching machines. • Explain the types of grinding and other super finishing processes apart from gear manufacturing processes. • Summarize numerical control of machine tools and write a part program.
19154C23P	Thermal Engineering	<ul style="list-style-type: none"> • Apply thermodynamic concepts to different air standard cycles and solve problems. • Solve problems in single stage and multistage air compressors • Explain the functioning and features of IC engines, components and auxiliaries. • Calculate performance parameters of IC Engines. • Explain the flow in Gas turbines and solve problems.
19154C24P	Strength of Materials	<ul style="list-style-type: none"> • Understand the concepts of stress and strain in simple and compound bars, the importance of principal stresses and principal planes. • Understand the load transferring mechanism in beams and stress distribution due to shearing force and bending moment. • Apply basic equation of simple torsion in designing of shafts and helical spring • Calculate the slope and deflection in beams using different methods. • Analyze and design thin and thick shells for the applied internal and external pressures.
19154C25P	Engineering Materials and Metallurgy	<ul style="list-style-type: none"> • Explain alloys and phase diagram, Iron-Iron carbon diagram and steel classification. • Explain isothermal transformation, continuous cooling diagrams and different heat treatment processes. • Clarify the effect of alloying elements on ferrous and non-ferrous metals • Summarize the properties and applications of non metallic materials. • Explain the testing of mechanical properties. .
19148S31CP	Probability and Statistics	<ul style="list-style-type: none"> ○ Appreciate the numerical techniques of interpolation in various intervals and apply the numerical techniques of differentiation and integration for engineering problems. ○ Understand the knowledge of various techniques and methods for solving first and second order ordinary differential equations. • Solve differential equations using Fourier series analysis which plays a vital role in engineering

LOCAL NEEDS

REGIONAL NEEDS

NATIONAL NEEDS

GLOBAL NEEDS

		<ul style="list-style-type: none"> • Be capable of mathematically formulating certain practical problems in terms of partial differential equations, solve them and physically interpret the results. • Have gained a well founded knowledge of Fourier series, their different possible forms and the frequently needed practical harmonic analysis that an engineer may have to make from discrete data.
19154C32P	Kinematics of Machinery	<ul style="list-style-type: none"> • Discuss the basics of mechanism • Calculate velocity and acceleration in simple mechanisms • Develop CAM profiles • Solve problems on gears and gear trains • Examine friction in machine elements
19154C33P	Production Planning and Control	<ul style="list-style-type: none"> ▪ Upon completion of this course, the students can able to prepare production planning and control activities such as work study, product planning, production scheduling, Inventory Control. • Describe the concepts of measurements to apply in various metrological instruments • Production between different types of surfaces to solve problems • They can plan manufacturing requirements manufacturing requirement Planning (MRP II) • They can plan manufacturing requirements Enterprise Resource Planning (ERP).
19154C34P	Engineering Metrology and Measurements	<ul style="list-style-type: none"> • Outline the principles of linear and angular measurement tools used for industrial • Applications of metrology and equipment. • Explain the procedure for conducting computer aided inspection • Demonstrate the techniques of form measurement used for industrial components • Discuss various measuring techniques of mechanical properties in industrial applications
19154L35P	Computer Aided Simulation and Analysis Laboratory	<ul style="list-style-type: none"> • simulate the working principle of air conditioning system, hydraulic and pneumatic cylinder • Cam follower mechanisms using MATLAB. • analyze the stresses and strains induced in plates, brackets and beams and heat transfer analysis • problems mode shape analysis of 3D components and beams • calculate the natural frequency and mode

LOCAL NEEDS

REGIONAL NEEDS

NATIONAL NEEDS

GLOBAL NEEDS

		<p>shape analysis of 2D components and beams.</p> <ul style="list-style-type: none"> • Explain the layout, construction and working of the components inside a thermal power plant. • Explain the layout, construction and working of the components inside a Diesel, Gas and Combined cycle power plants. • Explain the layout, construction and working of the components inside nuclear power plants. • Explain the layout, construction and working of the components inside Renewable energy power plants. • Explain the applications of power plants while extend their knowledge to power plant economics and environmental hazards and estimate the costs of electrical energy production.
19154C41P	Power Plant Engineering	
19154C42P	Dynamics of Machinery	<ul style="list-style-type: none"> • Calculate static and dynamic forces of mechanisms. • Calculate the balancing masses and their locations of reciprocating and rotating masses. • Compute the frequency of free vibration. • Compute the frequency of forced vibration and damping coefficient. • Calculate the speed and lift of the governor and estimate the gyroscopic effect on automobiles, ships and airplanes.
19154C43P	Design of Machine Elements	<ul style="list-style-type: none"> • Explain the influence of steady and variable stresses in machine component design. • Apply the concepts of design to shafts, keys and couplings. • Apply the concepts of design to temporary and permanent joints. • Apply the concepts of design to energy absorbing members, connecting rod and crank shaft. • Apply the concepts of design to bearings.
19154L45P	Dynamics Laboratory	<ul style="list-style-type: none"> • Explain gear parameters, kinematics of mechanisms, gyroscopic effect and working of labequipments. • Determine mass moment of inertia of mechanical element, governor effort and range sensitivity, natural frequency • Damping coefficient, torsional frequency, critical speeds of shafts, • Balancing mass of rotating and reciprocating masses, and transmissibility ratio.
19154C51P	Heat and Mass Transfer	<ul style="list-style-type: none"> • Apply heat conduction equations to different

LOCAL NEEDS

REGIONAL NEEDS

NATIONAL NEEDS

GLOBAL NEEDS

		<ul style="list-style-type: none"> surface configurations under steady state and transient conditions and solve problems Apply free and forced convective heat transfer correlations to internal and external flows through/over various surface configurations and solve problems Explain the phenomena of boiling and condensation, apply LMTD and NTU methods of thermal analysis to different types of heat exchanger configurations and solve problems Explain basic laws for Radiation and apply these principles to radiative heat transfer Apply diffusive and convective mass transfer equations and correlations to solve problems for different applications
19154C52P	Design of Transmission Systems	<ul style="list-style-type: none"> apply the concepts of design to belts, chains and rope drives. apply the concepts of design to spur, helical gears. apply the concepts of design to worm and bevel gears. apply the concepts of design to gear boxes . apply the concepts of design to cams, brakes and clutches
19154C53P	Automobile Engineering	<ul style="list-style-type: none"> discuss the engine auxiliary systems and engine emission control. distinguish the working of different types of transmission systems. explain the Steering, Brakes and Suspension Systems. predict possible alternate sources of energy for IC Engines. Acquired through the course and also from the given case studies
19154L55P	Heat Transfer Laboratory	<ul style="list-style-type: none"> conduct tests on natural and forced convective heat transfer apparatus . evaluate heat transfer coefficient. conduct tests to evaluate the performance of parallel/counter flow heat exchanger apparatus and reciprocating air compressor. conduct tests to evaluate the performance of refrigeration and airconditioning test rigs
19154C61P	Finite Elements Analysis	<ul style="list-style-type: none"> Summarize the basics of finite element formulation. Apply finite element formulations to solve one dimensional Problems. Apply finite element formulations to solve two dimensional scalar Problems.

LOCAL NEEDS

REGIONAL NEEDS

NATIONAL NEEDS

GLOBAL NEEDS

		<ul style="list-style-type: none"> • Apply finite element method to solve two dimensional Vector problems. • Apply finite element method to solve problems on iso parametric element and dynamic Problems.
19154C62P	Mechatronics	<ul style="list-style-type: none"> • Discuss the interdisciplinary applications of Electronics, Electrical, Mechanical and Computer Systems for the Control of Mechanical, Electronic Systems and sensor technology. • Discuss the architecture of Microprocessor and Microcontroller, Pin Diagram, Addressing • Modes of Microprocessor and Microcontroller. • Discuss Programmable Peripheral Interface, Architecture of 8255 PPI, and various device Interfacing • Explain the architecture, programming and application of programmable logic controllers to problems and challenges in the areas of Mechatronic engineering.
19154C63P	Computer Integrated Manufacturing	<ul style="list-style-type: none"> • Explain the basic concepts of CAD, CAM and computer integrated manufacturing Systems • Summarize the production planning and control and computerized process planning • Differentiate the different coding systems used in group technology • Explain the concepts of flexible manufacturing system (FMS) and automated guided vehicle (AGV) system • Classification of robots used in industrial applications
19154L65P	Mechatronics Laboratory	<ul style="list-style-type: none"> • Demonstrate the functioning of mechatronics system with various pneumatic, hydraulic and electrical systems. • Demonstrate the functioning of control systems with the help of PLC and microcontrollers.
19160S71P	Total Quality Management	<ul style="list-style-type: none"> • The student would be able to apply the tools and techniques of quality management. • discuss the engine auxiliary systems and engine emission control. • distinguish the working of different types of transmission systems. • Manufacturing and services processes. • practice the skills, diligence, and commitment to excellence needed to engage in lifelong learning.

LOCAL NEEDS

REGIONAL NEEDS

NATIONAL NEEDS

GLOBAL NEEDS

19154C72P	Process Planning and Cost Estimation	<ul style="list-style-type: none"> • select the process, equipment and tools for various industrial products. • prepare process planning activity chart. • explain the concept of cost estimation. • compute the for different type of shop floor. • compute the for different type of job order cost
19154C73P	Applied Hydraulics and Pneumatics	<ul style="list-style-type: none"> • Apply the working principles of fluid power systems and hydraulic pumps. • Apply the working principles of hydraulic actuators and control components. • Design and develop hydraulic circuits and systems. • Apply the working principles of pneumatic circuits and power system and its components. • Identify various troubles shooting methods in fluid power systems.
19154E44AP	Gas Dynamics and Jet Propulsion	<ul style="list-style-type: none"> • Apply the concept of compressible flows in variable area ducts. • Apply the concept of compressible flows in constant area ducts. • examine the effect of compression and expansion waves in compressible flow. • use the concept of gas dynamics in Jet Propulsion. • apply the concept of gas dynamics in Space Propulsion.
19154E54CP	Robotics	<ul style="list-style-type: none"> • State the basic concepts and terminologies of robots • Know the Procedures for Forward and Inverse Kinematics, Dynamics for Various Robots • Derive the Forward and Inverse Kinematics, Dynamics for Various Robots • Apply the various programming techniques in industrial applications • Analyze the use of various types of robots in different applications
19154E74CP	Unconventional Machining Process	<ul style="list-style-type: none"> • Explain the need for unconventional machining processes and its classification • Compare various thermal energy and electrical energy based unconventional machining processes. • Summarize various chemical and electro-chemical energy based unconventional machining processes. • Explain various nano abrasives based unconventional machining processes. • Distinguish various recent trends based unconventional machining processes.

LOCAL NEEDS

REGIONAL NEEDS

NATIONAL NEEDS

GLOBAL NEEDS

M.TECH(F.T)(R-2019)

Course code	Course name	Course outcomes
19248S11E	Advanced Engineering Mathematics	<ul style="list-style-type: none"> • Solve higher order linear differential equations and apply to modeling and analyzing mass spring systems. • Apply Laplace transform and Fourier transform techniques to solve differential equations involved in Vibration theory, Heat transfer and related engineering applications. • Learn the idea of random variables (discrete/continuous) and probability distributions in analyzing the probability models arising in quality control systems. • Find the point and interval estimates, derive confidence intervals and understand the methods of estimation and analyze data statistically and interpretation of the results in inventory control and knowledge to ANOVA: One – way, Two – way with/without interactions, Latin Squares ANOVA technique. • Apply statistical methods like correlation, regression analysis in analyzing, interpreting experimental data and probability theory in testing and quality control.
19254C12	Theory of Metal Cutting	<ul style="list-style-type: none"> • Understand the basic structures of concept of tools and tool materials and Apply cutting mechanics to metal machining based on cutting force and power consumption. • Impart fundamental knowledge about forces and chips formed during the metal machining process. • Impart fundamental knowledge on tool materials, tool life, cutting fluids and tool wear mechanisms • Distinguish between orthogonal and oblique cutting and Understand the Heat distribution during machining. • Learn Importance of Chatter in various machining and avoidance of chatter.
19254C13	Advanced Manufacturing Processes	<ul style="list-style-type: none"> • Understand the basic structures of cutting tool materials and cutting parameters in non thermal energy advanced machining processes. • Understand the various input and output parameters that influence in the performance of newer electric energy based advanced machining processes. • Impart the knowledge about laser beam, electron beam, and Ion beam types advanced machining process and its characteristics. • Ability to understand the operation of micro devices,

LOCAL NEEDS

REGIONAL NEEDS

NATIONAL NEEDS

GLOBAL NEEDS

		<ul style="list-style-type: none"> micro systems and their applications. Ability to design the micro devices, micro systems using the micro fabrication process.
19254C14	Mechanical Metallurgy	<ul style="list-style-type: none"> Understand the mechanical behavior of metals; Protect the metals from hardness and toughness Understand the environmental factors affecting the mechanical behavior of materials by fatigue damage. Evaluate the high temperature properties of metals and fracture behavior of metals. Design the metals for specific applications by creep behavior.
19254C15	Automated Computer Integrated Manufacturing Systems	<ul style="list-style-type: none"> Become familiar on the basic concepts of Cad, Cam & Computer Integrated Manufacturing and its importance in the global competitive market. Understand the material transfer mechanism in automated manufacturing, anatomy of industrial robots and their application in various areas of automated manufacturing and storage systems used Understand the usage of group technology concept and clustering algorithms in modern manufacturing systems and Understand the concepts of Flexible manufacturing system. Make the students to get knowledge about Computer Aided Process Planning approaches. Get familiarizes with the concepts process control and monitoring and automatic data capture techniques.
19254CRS	Research Led Seminar	<ul style="list-style-type: none"> The students will be getting the training to face the audience and to interact with the audience with confidence. To tackle any problem during group discussion in the corporate interviews. Generate ideas on how to build the research based teaching and to create a research-based learning environment. This includes both research-oriented didactics and teaching students to use investigative approaches. Analyze national frameworks, policies and funding that may help or hinder the development of research-based teaching in diverse types of institutions.
19254L17	CIM Lab	<ul style="list-style-type: none"> Use parametric 3D CAD software tools in the correct manner for making geometric part models, assemblies automated drawings of mechanical components and assemblies. Evaluate design, analyze and optimize using commercial

LOCAL NEEDS

REGIONAL NEEDS

NATIONAL NEEDS

GLOBAL NEEDS

		<ul style="list-style-type: none"> • CAD, CAE software as black box for required mass properties/ stress, deflection / temperature distribution etc. under realistic loading and constraining conditions • Apply the concepts of machining for the purpose of selection of appropriate machining centers, machining parameters, select appropriate cutting tools for CNC milling and turning equipment, set-up, program • operate CNC milling and turning equipment.
19254C21	Production Management	<ul style="list-style-type: none"> • Develop knowledge on decision making and forecasting the role of a materials manager in an organization. • Develop aggregate capacity plans in operation environments. • Shall be able to manage the activities of materials manager like purchasing, inventory analysis, storage etc. in a scientific manner. • Shall be able to practice material planning through modern materials management tools like JIT. • Able to prepare job shop scheduling
19254C22	MEMS and Nano Technology	<ul style="list-style-type: none"> • The students are expected to understand MEMS and Students will able to design MEMS and apply knowledge of Nano-technology • Students will be able to explain about fabrication processes and levels of micro system packaging • Students will be able to explain micro sensors, micro-actuators, their types and applications Students get knowledge about Nano materials and various Nano measurements and to familiarize about various equipments. • Bring out the importance of material characterization and various methods and Students will able to select special materials for MEMS • Students will able to calculate the static and dynamic behavior of simple mechanical Microsystems, e.g. cantilevers and membranes Students will able to perform special Nano finishing techniques
19254C23	Manufacturing Metrology and Quality Control	<ul style="list-style-type: none"> • Understand the methods of measurement and selection of measuring instruments ,standards of measurement • Identify and apply various measuring instruments • Explain tolerance, limits of size, fits, geometric and position tolerances and gauge design • Recommend the Quality Control Techniques and Statistical Tools appropriately Analyze the Data collected • Develop an ability of problem solving and decision making by identifying and analyzing the cause for

LOCAL NEEDS

REGIONAL NEEDS

NATIONAL NEEDS

GLOBAL NEEDS

		<ul style="list-style-type: none"> variation and recommend suitable corrective actions for quality improvement
19254L26	Automation Lab	<ul style="list-style-type: none"> Study of sensors, Hydraulic and Pneumatic actuators and experimentation of its characterization for industrial applications. Develop an understanding of plc ladder diagram related to industrial automation systems and measure its performance. Develop ability to take measurements of speed , vibrations etc., Develop pneumatic circuit /hydraulic circuit for industrial applications and measure its performance Study of data acquisition system and its industrial applications
19254CRM	Research Methodology	<ul style="list-style-type: none"> Discuss research methodology concepts, research problems, research designs, thesis preparations, publications and research methods. Analyze and evaluate research works and to formulate a research problem to pursue research Prepare a thesis or a technical paper, and present or publish them Apply the various research methods followed in engineering research for formulation and Design of own research problems and to utilize them in their research project.
19254CBR	Participation in Bounded Research	<ul style="list-style-type: none"> Hands on exposure to problem solving tools in contemporary research Evolve research intuitiveness and orientation Familiarize with cutting edge research trends An understanding of professional and ethical responsibility and communicate effectively.
192TECWR	Technical Writing/Seminar	<ul style="list-style-type: none"> Participate actively in writing activities that model effective scientific and technical communication in the workplace. Understand how to apply technical information and knowledge in practical documents. Practice the unique qualities of professional writing style, including sentence conciseness, readability, clarity, accuracy, honesty, etc., Collect, analyze, document, and report research clearly, concisely, logically, and ethically. Develop professional work habits, including those necessary for effective collaboration and cooperation with other students, instructors, and Service.

LOCAL NEEDS

REGIONAL NEEDS

NATIONAL NEEDS

GLOBAL NEEDS

19254C31	Metal Forming Process	<ul style="list-style-type: none"> • Student can be Understood the state of stress in various dimensions. • Students will able to select various forming process based on complexity and Importance of flow curve in metal forming process • Students will able to execute various stress evaluation methods at different shape and plane and Students will able to learn the design principles and design considerations of metal forming processes such as forging, rolling, extrusion etc. • Impart the knowledge to Different high speed energy forming process and its effect on stress and strain relationship. • Students will learn the latest forming technology such as HERF & hydro forming and Students will able to understand competent design, execution, and assessment of the methods used for solidification, thermal treatment.
19254CSR	Design Project /SOCIO Technical Project	<ul style="list-style-type: none"> • Apply knowledge of mathematics, science and engineering • Design and Conduct Experiments as Well as Analyze and Interpret Data. • Design a system, component or process to meet desired needs and identify, formulate and solve complex engineering problems creatively and innovatively. • The broad education necessary to understand the impact of engineering solutions in a global and societal context. • Use techniques, skills and modern engineering tools necessary for engineering industries
19254P35	Project Work Phase - I	<ul style="list-style-type: none"> • Demonstrate a depth of knowledge of manufacturing Engineering. • Demonstrate a thorough and systematic understanding of project contents. • Understand methodologies and professional way of documentation and communication. • Know the key stages in designing, analyzing and development of the project. • Extend or use the idea of his/her area of work and they are in a position to carry out the remaining phase-II work in a systematic way.
19254P41	Project Work Phase - II	<ul style="list-style-type: none"> • Continue the phase I work on the selected topic as per the formulated methodology under the same supervisor. • Solve the identified problem based on the formulated methodology • Develop skills to analyze and discuss the test results, and make conclusions. • On completion of the project work student will be in a

LOCAL NEEDS

REGIONAL NEEDS

NATIONAL NEEDS

GLOBAL NEEDS

		<ul style="list-style-type: none"> position to take up any challenging practical problems in the field of manufacturing and find better solutions to it. Demonstrate knowledge of contemporary issues in their chosen field of research.
19254E16A	Materials Management and Logistics	<ul style="list-style-type: none"> Identifying the scope for integrating materials management function over the logistics and supply chain operations. Integrate the organization wide materials requirement to develop an overall plan (MRP). Identify, study, compare, and evaluate alternatives, select and relate with a good supplier Analyzing the materials in storage, handling, packaging, shipping distributing and standardizing. Apply various purchasing method and inventory controlling techniques into practice.
19254E16B	Financial Management	<ul style="list-style-type: none"> Demonstrate an understanding of the overall role and importance of the finance accounting function and Identifying various providers of finance Impart the knowledge to various elements of cost and its cost determination methods. Understand the management working capital and Inventory valuation methods and Understanding the impact of Share Capital and Loan Capital on the organization. Demonstrate basic finance management knowledge and capital budgeting Communicate effectively using standard business terminology and profit planning and analysis.
19254E16C	Manufacturing Information Systems	<ul style="list-style-type: none"> Understand the general principles of Production Information Systems by: Illustrating how Production Information Systems is an integral part of the management of production systems. To make them to understand design database terminologies and Creating relationships between tables and enforcing referential integrity Develop a desktop database application by: Creating a new database, Defining Data Types that define the data being stored and Creating Tables in design view. Distinguish information systems for various manufacturing structure modules. Apply information systems in industry and Identify ways information systems & technology may improve an organization's performance, including improving organizational processes, decision-making, collaboration, and personal productivity.
19254E24A	Finite Element	<ul style="list-style-type: none"> Apply direct stiffness, Rayleigh-Ritz, Galerkin method to

LOCAL NEEDS

REGIONAL NEEDS

NATIONAL NEEDS

GLOBAL NEEDS

	Application in Manufacturing	<ul style="list-style-type: none"> • solve engineering problems and outline the requirements for convergence. • Analyze linear 1D problems like bars and trusses; 2D structural problems using CST element and analyze the axi-symmetric problems with triangular elements. • Write shape functions for 4 and 8 node quadrilateral, 6 node triangle elements and apply numerical integration to solve; 1D and 2D; stiffness integrations. • Knowledge on giving input of material and processing characteristics on analysis and developing code for 1 D analysis. • Making FE analysis on metal casting , metal cutting and welding etc.,
19254E24B	Lean Manufacturing	<ul style="list-style-type: none"> • Understand the concepts in Lean Manufacturing. • Understand the tools and methods of Lean Manufacturing. • Understand the TQM principles and value stream mapping procedures. • six sigma method to improve performance. • Making case study on Lean implementation at industries.
19254E24C	Design and Analysis of Experiments	<ul style="list-style-type: none"> • Understand the research types and proposals • Study about method of analysis , errors and problem solving approaches like logical , soft and creative • Development of models by use of analogy, heuristics and simulation. • Optimize process conditions by developing empirical models using experimental data. • Optimizing process by factorial design principles and Taguchi approach and also ability to write report
19254E25A	Advanced Metrology and Computer Aided Inspection	<ul style="list-style-type: none"> • Explain the significance of calibration and Identify measurement errors • Describe the surface measurement methods. • Study on interferometry. • Describe about CMM and Laser inspection. • Assess surface roughness and form errors by computer aided inspection techniques.
19254E25B	Maintenance Management	<ul style="list-style-type: none"> • Explain Centralized and decentralized maintenance organization structures, reliability and Availability, MTBF, MTTR • Understand basic models of maintenance systems, including various aspects of breakdown & prevention of breakdown in respect of the maintenance and their controls • Understand spares management, costing and budgeting of equipment maintenance resources planning for flaming for maintenance facilities and their implications in real

LOCAL NEEDS

REGIONAL NEEDS

NATIONAL NEEDS

GLOBAL NEEDS

		<ul style="list-style-type: none"> scenario. Condition monitoring programs to ensure performance of equipments. Various practical techniques involved with different levels of use of these techniques Cost and resources management for maintenance
19254E25C	Optimization Techniques	<ul style="list-style-type: none"> Describe about optimization techniques like single and multi variable algorithms. Explain about one dimensional minimization/elimination methods, interpolation methods. Explain equality and inequality constraints for optimization like Direct and Indirect methods using penalty functions, Lagrange multipliers etc., Explain unconstrained optimization methods like direct, unvaried, pattern, conjugate gradient, etc., Explain genetic algorithms, neural network and fuzzy logic principles in Heuristics optimization.
19254E32A	Manufacturing Systems and Simulation	<ul style="list-style-type: none"> Develop Manufacturing Models of Discrete event systems. Generation of Uncertainty using Random numbers and Random Variants. Input, Output Analysis: Verification & Validation of Models and Optimization Impart the concepts of modeling layers of society's critical infrastructure networks and knowledge of GPSS Build tools to view and control simulations and their results.
19254E32B	Instrumentation and Control Engineering	<ul style="list-style-type: none"> An understanding of basic concepts of measurement and its error, calibration. an understanding of measuring devices to measure speed, frequency, acceleration and flow rate, pressure and temperature measurement devices. Explain the working principle of various transducers Analysis of failure in machineries and condition monitoring techniques. Analysis by Data acquisition system and Programmable Logic Controls.
19254E32C	Artificial Intelligence and Neural Networks	<ul style="list-style-type: none"> Understand the fundamental theory and concepts of neural networks, Identify different neural network architectures, algorithms, applications and their limitations & understand the concept behind neural networks for learning non-linear vector functions. Understand the concepts of fuzzy sets, knowledge representation using fuzzy rules, approximate reasoning, fuzzy inference systems, and fuzzy logic control and other machine intelligence applications of fuzzy logic. Understand the basics of an evolutionary computing

LOCAL NEEDS

REGIONAL NEEDS

NATIONAL NEEDS

GLOBAL NEEDS

		<ul style="list-style-type: none"> paradigm known as genetic algorithms and its application to engineering optimization problems. Identify and describe Fuzzy Logic, Neuro-modeling and Artificial Neural Network techniques in building intelligent machines and Apply Artificial Neural Network & Fuzzy Logic models to handle uncertainty and solve engineering problems. Reveal different applications of these models such as Automobile Fuel Efficiency prediction, kinematics inverse mechanism and Soft Computing for Color Recipe Prediction to solve engineering and other problems.
19254E33A	Product Design and Development	<ul style="list-style-type: none"> Understand the technical and business aspects of the product development process and Competence with a set of tools and methods for product design and development. Skilled in implementation of gathering data from customers and establish technical specification and identify and evaluate the key factors and the interdependence of these factors in the design of effective operating systems in product design. Impart the knowledge to product specification and concept generation. Understanding the different approaches used across various PD methodologies and its tools, methods and techniques. Understand the principles behind product modularization, to be able to understand intellectual property issues in product development.
19254E33B	Fluid Power Automation	<ul style="list-style-type: none"> Impart the knowledge to basic fluid power terms, units and fluid power graphic symbols, components and Aware of the importance and the scope of hydraulics and pneumatics in the modern industry. Recognize the suitable pump and actuators for particular application. Select various control valves such as pressure control, flow control, direction control valves and use them in hydraulic and pneumatic circuit development. Designing the hydraulic and pneumatic circuits using ladder diagram and Analyze the hydraulic and pneumatic circuit for energy efficiency. Select the appropriate control system like electrical, electronics, and PLC to control the fluid power system and Trouble-shoot and identify maintenance problems associated with fluid power system
19254E34A	Advanced Material Technology	<ul style="list-style-type: none"> Relate the mechanical properties of materials to their structure and solve realistic and/or fundamental problems relating to the mechanical behavior of materials for

LOCAL NEEDS

REGIONAL NEEDS

NATIONAL NEEDS

GLOBAL NEEDS

		<p>individual solutions and tests.</p> <ul style="list-style-type: none"> Express the information about fundamental conceptions of fracture mechanics with his/her own sentences and Calculates and interprets mechanical properties using Griffith equation. Understand the students a thorough systematic approach to the selection of metals, ceramics, polymers, and composites required for mechanical design. Familiarize the students with material properties and materials fabrication processes and an approach for selecting a process capable of producing a component possessing the size, shape, properties, and cost dictated by the design. Develop new materials and technologies and detect causes of the production defects and breaking of the metallic constructions during operation. Acquired basic and advanced engineering knowledge about ceramics, polymers and polymers matrix composite and understand the mechanical, optical, thermal and electrical properties of these materials.
19254E34B	Industrial Ergonomics	<ul style="list-style-type: none"> Analyze and calculate the level of risk in a job causing stress, fatigue and musculoskeletal disorders and design appropriate work systems. Be aware of the application of Mannequins in Ergonomics in the past, understand the concept and importance of Anthropometry, gain practical experience in collecting anthropometric data and learn the applications of Anthropometry. Design a system, component, or process to meet accepted human factors and workplace ergonomics standards within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability. Assess the occupational environmental factors like heat stress, noise, and vibration and RSPM level in the industry. Understand how these separate systems interact to yield integrated physiological responses to challenges such as exercise, fasting and ascent to high altitude, and how they can sometimes fail.

DEPARTMENT OF MECHANICAL ENGINEERING

COURSE OBJECTIVE M.TECH(P.T) (R-2019)

Course code	Course name	Course outcomes
19248S11EP	Advanced Engineering Mathematics	<ul style="list-style-type: none"> • Solve higher order linear differential equations and apply to modeling and analyzing mass spring systems. • Apply Laplace transform and Fourier transform techniques to solve differential equations involved in Vibration theory, Heat transfer and related engineering applications. • Learn the idea of random variables (discrete/continuous) and probability distributions in analyzing the probability models arising in quality control systems. • Find the point and interval estimates, derive confidence intervals and understand the methods of estimation and analyze data statistically and interpretation of the results in inventory control and knowledge to ANOVA: One – way, Two – way with/without interactions, Latin Squares ANOVA technique. • Apply statistical methods like correlation, regression analysis in analyzing, interpreting experimental data and probability theory in testing and quality control.
19254C12P	Theory of Metal Cutting	<ul style="list-style-type: none"> • Understand the basic structures of concept of tools and tool materials and Apply cutting mechanics to metal machining based on cutting force and power consumption. • Impart fundamental knowledge about forces and chips formed during the metal machining process. • Impart fundamental knowledge on tool materials, tool life, cutting fluids and tool wear mechanisms • Distinguish between orthogonal and oblique cutting and Understand the Heat distribution during machining. • Learn Importance of Chatter in various machining and avoidance of chatter.
19254C13P	Advanced Manufacturing Processes	<ul style="list-style-type: none"> • Understand the basic structures of cutting tool materials and cutting parameters in non thermal energy advanced machining processes. • Understand the various input and output parameters that influence in the performance of newer electric energy based advanced machining processes. • Impart the knowledge about laser beam, electron beam, and Ion beam types advanced machining process and its characteristics. • Ability to understand the operation of micro devices,

LOCAL NEEDS

REGIONAL NEEDS

NATIONAL NEEDS

GLOBAL NEEDS

		<ul style="list-style-type: none"> micro systems and their applications. Ability to design the micro devices, micro systems using the micro fabrication process.
19254L14P	CIM Lab	<ul style="list-style-type: none"> Use parametric 3D CAD software tools in the correct manner for making geometric part models, assemblies automated drawings of mechanical components and assemblies. Evaluate design, analyze and optimize using commercial CAD, CAE software as black box for required mass properties/ stress, deflection / temperature distribution etc. under realistic loading and constraining conditions Apply the concepts of machining for the purpose of selection of appropriate machining centers, machining parameters, select appropriate cutting tools for CNC milling and turning equipment, set-up, program operate CNC milling and turning equipment.
19254CRSP	Research Led Seminar	<ul style="list-style-type: none"> The students will be getting the training to face the audience and to interact with the audience with confidence. To tackle any problem during group discussion in the corporate interviews. Generate ideas on how to build the research based teaching and to create a research-based learning environment. This includes both research-oriented didactics and teaching students to use investigative approaches. Analyze national frameworks, policies and funding that may help or hinder the development of research-based teaching in diverse types of institutions.
19254C21P	Production Management	<ul style="list-style-type: none"> Develop knowledge on decision making and forecasting the role of a materials manager in an organization. Develop aggregate capacity plans in operation environments. Shall be able to manage the activities of materials manager like purchasing, inventory analysis, storage etc. in a scientific manner. Shall be able to practice material planning through modern materials management tools like JIT. Able to prepare job shop scheduling
19254C22P	MEMS and Nano Technology	<ul style="list-style-type: none"> The students are expected to understand MEMS and Students will able to design MEMS and apply knowledge of Nano-technology Students will be able to explain about fabrication processes and levels of micro system packaging

LOCAL NEEDS

REGIONAL NEEDS

NATIONAL NEEDS

GLOBAL NEEDS

		<ul style="list-style-type: none"> • Students will be able to explain micro sensors, micro-actuators, their types and applications Students get knowledge about Nano materials and various Nano measurements and to familiarize about various equipments. • Bring out the importance of material characterization and various methods and Students will able to select special materials for MEMS • Students will able to calculate the static and dynamic behavior of simple mechanical Microsystems, e.g. cantilevers and membranes Students will able to perform special Nano finishing techniques
19254C41P	Manufacturing Metrology and Quality Control	<ul style="list-style-type: none"> • Understand the methods of measurement and selection of measuring instruments ,standards of measurement • Identify and apply various measuring instruments • Explain tolerance, limits of size, fits, geometric and position tolerances and gauge design • Recommend the Quality Control Techniques and Statistical Tools appropriately Analyze the Data collected • Develop an ability of problem solving and decision making by identifying and analyzing the cause for variation and recommend suitable corrective actions for quality improvement
19254L24P	Automation Lab	<ul style="list-style-type: none"> • Study of sensors, Hydraulic and Pneumatic actuators and experimentation of its characterization for industrial applications. • Develop an understanding of plc ladder diagram related to industrial automation systems and measure its performance. • Develop ability to take measurements of speed , vibrations etc., • Develop pneumatic circuit /hydraulic circuit for industrial applications and measure its performance • Study of data acquisition system and its industrial applications
19254CRMP	Research Methodology	<ul style="list-style-type: none"> • Discuss research methodology concepts, research problems, research designs, thesis preparations, publications and research methods. • Analyze and evaluate research works and to formulate a research problem to pursue research • Prepare a thesis or a technical paper, and present or publish them • Apply the various research methods followed in engineering research for formulation and • Design of own research problems and to utilize them in

LOCAL NEEDS

REGIONAL NEEDS

NATIONAL NEEDS

GLOBAL NEEDS

		<ul style="list-style-type: none"> • their research project.
19254CBRP	Participation in Bounded Research	<ul style="list-style-type: none"> • Hands on exposure to problem solving tools in contemporary research • Evolve research intuitiveness and orientation • Familiarize with cutting edge research trends • An understanding of professional and ethical responsibility and communicate effectively.
192TECWPR	Technical Writing/Seminar	<ul style="list-style-type: none"> • Participate actively in writing activities that model effective scientific and technical communication in the workplace. • Understand how to apply technical information and knowledge in practical documents. • Practice the unique qualities of professional writing style, including sentence conciseness, readability, clarity, accuracy, honesty, etc., • Collect, analyze, document, and report research clearly, concisely, logically, and ethically. • Develop professional work habits, including those necessary for effective collaboration and cooperation with other students, instructors, and Service
19254C31P	Mechanical Metallurgy	<ul style="list-style-type: none"> • Understand the mechanical behavior of metals; • Protect the metals from hardness and toughness • Understand the environmental factors affecting the mechanical behavior of materials by fatigue damage. • Evaluate the high temperature properties of metals and fracture behavior of metals. • Design the metals for specific applications by creep behavior.
19254C32P	Automated Computer Integrated Manufacturing Systems	<ul style="list-style-type: none"> • Become familiar on the basic concepts of Cad, Cam & Computer Integrated Manufacturing and its importance in the global competitive market. • Understand the material transfer mechanism in automated manufacturing, anatomy of industrial robots and their application in various areas of automated manufacturing and storage systems used • Understand the usage of group technology concept and clustering algorithms in modern manufacturing systems and Understand the concepts of Flexible manufacturing system. • Make the students to get knowledge about Computer Aided Process Planning approaches. • Get familiarizes with the concepts process control and monitoring and automatic data capture techniques
19254C42P	Metal Forming Process	<ul style="list-style-type: none"> • Student can be Understood the state of stress in various

LOCAL NEEDS

REGIONAL NEEDS

NATIONAL NEEDS

GLOBAL NEEDS

		<ul style="list-style-type: none"> dimensions. Students will able to select various forming process based on complexity and Importance of flow curve in metal forming process Students will able to execute various stress evaluation methods at different shape and plane and Students will able to learn the design principles and design considerations of metal forming processes such as forging, rolling, extrusion etc. Impart the knowledge to Different high speed energy forming process and its effect on stress and strain relationship. Students will learn the latest forming technology such as HERF & hydro forming and Students will able to understand competent design, execution, and assessment of the methods used for solidification, thermal treatment.
19254CSR	Design Project /SOCIO Technical Project	<ul style="list-style-type: none"> Apply knowledge of mathematics, science and engineering Design and Conduct Experiments as Well as Analyze and Interpret Data. Design a system, component or process to meet desired needs and identify, formulate and solve complex engineering problems creatively and innovatively. The broad education necessary to understand the impact of engineering solutions in a global and societal context. Use techniques, skills and modern engineering tools necessary for engineering industries
19254C41P	Manufacturing Metrology and Quality Control	<ul style="list-style-type: none"> Understand the methods of measurement and selection of measuring instruments ,standards of measurement Identify and apply various measuring instruments Explain tolerance, limits of size, fits, geometric and position tolerances and gauge design Recommend the Quality Control Techniques and Statistical Tools appropriately Analyze the Data collected
19254C42P	Metal Forming Process	<ul style="list-style-type: none"> Student can be Understood the state of stress in various dimensions. Students will able to select various forming process based on complexity and Importance of flow curve in metal forming process Students will able to execute various stress evaluation methods at different shape and plane and Students will able to learn the design principles and design considerations of metal forming processes such as forging, rolling, extrusion etc. Impart the knowledge to Different high speed energy

LOCAL NEEDS

REGIONAL NEEDS

NATIONAL NEEDS

GLOBAL NEEDS

		<ul style="list-style-type: none"> forming process and its effect on stress and strain relationship. Students will learn the latest forming technology such as HERF & hydro forming and Students will able to understand competent design, execution, and assessment of the methods used for solidification, thermal treatment.
19254P44P	Project Work Phase - I	<ul style="list-style-type: none"> Demonstrate a depth of knowledge of manufacturing Engineering. Demonstrate a thorough and systematic understanding of project contents. Understand methodologies and professional way of documentation and communication. Know the key stages in designing, analyzing and development of the project. Extend or use the idea of his/her area of work and they are in a position to carry out the remaining phase-II work in a systematic way.
19254P61P	Project Work Phase - II	<ul style="list-style-type: none"> Continue the phase I work on the selected topic as per the formulated methodology under the same supervisor. Solve the identified problem based on the formulated methodology. Develop skills to analyze and discuss the test results, and make conclusions. On completion of the project work student will be in a position to take up any challenging practical problems in the field of manufacturing and find better solutions to it. Demonstrate knowledge of contemporary issues in their chosen field of research.
19254E33AP	Materials Management and Logistics	<ul style="list-style-type: none"> Identifying the scope for integrating materials management function over the logistics and supply chain operations. Integrate the organization wide materials requirement to develop an overall plan (MRP). Identify, study, compare, and evaluate alternatives, select and relate with a good supplier. Analyzing the materials in storage, handling, packaging, shipping distributing and standardizing. Apply various purchasing method and inventory controlling techniques into practice.
19254E33BP	Financial Management	<ul style="list-style-type: none"> Demonstrate an understanding of the overall role and importance of the finance accounting function and Identifying various providers of finance Impart the knowledge to various elements of cost and its cost determination methods. Understand the management working capital and

LOCAL NEEDS

REGIONAL NEEDS

NATIONAL NEEDS

GLOBAL NEEDS

		<ul style="list-style-type: none"> inventory valuation methods and Understanding the impact of Share Capital and Loan Capital on the organization. Demonstrate basic finance management knowledge and capital budgeting. Communicate effectively using standard business terminology and profit planning and analysis.
19254E33CP	Manufacturing Information Systems	<ul style="list-style-type: none"> Understand the general principles of Production Information Systems by: Illustrating how Production Information Systems is an integral part of the management of production systems. To make them to understand design database terminologies and Creating relationships between tables and enforcing referential integrity Develop a desktop database application by: Creating a new database, Defining Data Types that define the data being stored and Creating Tables in design view. Distinguish information systems for various manufacturing structure modules. Apply information systems in industry and Identify ways information systems & technology may improve an organization's performance, including improving organizational processes, decision-making, collaboration, and personal productivity.
19254E23AP	Finite Element Application in Manufacturing	<ul style="list-style-type: none"> Apply direct stiffness, Rayleigh-Ritz, Galerkin method to solve engineering problems and outline the requirements for convergence. Analyze linear 1D problems like bars and trusses; 2D structural problems using CST element and analyze the axi-symmetric problems with triangular elements. Write shape functions for 4 and 8 node quadrilateral, 6 node triangle elements and apply numerical integration to solve; 1D and 2D; stiffness integrations. Knowledge on giving input of material and processing characteristics on analysis and developing code for 1 D analysis. Making FE analysis on metal casting , metal cutting and welding etc.,
19254E23BP	Lean Manufacturing	<ul style="list-style-type: none"> Understand the concepts in Lean Manufacturing. Understand the tools and methods of Lean Manufacturing. Understand the TQM principles and value stream mapping procedures. six sigma method to improve performance. Making case study on Lean implementation at industries.
19254E23CP	Design and Analysis of	<ul style="list-style-type: none"> Understand the research types and proposals

LOCAL NEEDS

REGIONAL NEEDS

NATIONAL NEEDS

GLOBAL NEEDS

	Experiments	<ul style="list-style-type: none"> • Study about method of analysis , errors and problem solving approaches like logical , soft and creative • Development of models by use of analogy, heuristics and simulation. • Optimize process conditions by developing empirical models using experimental data. • Optimizing process by factorial design principles and Taguchi approach and also ability to write report
19254E43AP	Advanced Metrology and Computer Aided Inspection	<ul style="list-style-type: none"> • Explain the significance of calibration and Identify measurement errors • Describe the surface measurement methods. • Study on interferometry. • Describe about CMM and Laser inspection. • Assess surface roughness and form errors by computer aided inspection techniques.
19254E43BP	Maintenance Management	<ul style="list-style-type: none"> • Explain Centralized and decentralized maintenance organization structures, reliability and Availability, MTBF, MTTR • Understand basic models of maintenance systems, including various aspects of breakdown & prevention of breakdown in respect of the maintenance and their controls • Understand spares management, costing and budgeting of equipment maintenance resources planning for flaming for maintenance facilities and their implications in real scenario. • Condition monitoring programs to ensure performance of equipments. Various practical techniques involved with different levels of use of these techniques • Cost and resources management for maintenance
19254E43CP	Optimization Techniques	<ul style="list-style-type: none"> • Describe about optimization techniques like single and multi variable algorithms. • Explain about one dimensional minimization/elimination methods, interpolation methods. • Explain equality and inequality constraints for optimization like Direct and Indirect methods using penalty functions, Lagrange multipliers etc., • Explain unconstrained optimization methods like direct, unvaried, pattern, conjugate gradient, etc., • Explain genetic algorithms, neural network and fuzzy logic principles in Heuristics optimization.
19254E51AP	Manufacturing Systems and Simulation	<ul style="list-style-type: none"> • Develop Manufacturing Models of Discrete event systems. • Generation of Uncertainty using Random numbers and Random Variants. • Input, Output Analysis: Verification & Valediction of

LOCAL NEEDS

REGIONAL NEEDS

NATIONAL NEEDS

GLOBAL NEEDS

		<p>Models and Optimization</p> <ul style="list-style-type: none"> Impart the concepts of modeling layers of society's critical infrastructure networks and knowledge of GPSS Build tools to view and control simulations and their results.
19254E51BP	Instrumentation and Control Engineering	<ul style="list-style-type: none"> An understanding of basic concepts of measurement and its error, calibration. an understanding of measuring devices to measure speed, frequency, acceleration and flow rate, pressure and temperature measurement devices. Explain the working principle of various transducers Analysis of failure in machineries and condition monitoring techniques. Analysis by Data acquisition system and Programmable Logic Controls.
19254E51 CP	Artificial Intelligence and Neural Networks	<ul style="list-style-type: none"> Understand the fundamental theory and concepts of neural networks, Identify different neural network architectures, algorithms, applications and their limitations & understand the concept behind neural networks for learning non-linear vector functions. Understand the concepts of fuzzy sets, knowledge representation using fuzzy rules, approximate reasoning, fuzzy inference systems, and fuzzy logic control and other machine intelligence applications of fuzzy logic. Understand the basics of an evolutionary computing paradigm known as genetic algorithms and its application to engineering optimization problems. Identify and describe Fuzzy Logic, Neuro-modeling and Artificial Neural Network techniques in building intelligent machines and Apply Artificial Neural Network & Fuzzy Logic models to handle uncertainty and solve engineering problems. Reveal different applications of these models such as Automobile Fuel Efficiency prediction, kinematics inverse mechanism and Soft Computing for Color Recipe Prediction to solve engineering and other problems.
19254E52AP	Product Design and Development	<ul style="list-style-type: none"> Understand the technical and business aspects of the product development process and Competence with a set of tools and methods for product design and development. Skilled in implementation of gathering data from customers and establish technical specification and identify and evaluate the key factors and the interdependence of these factors in the design of effective operating systems in product design. Impart the knowledge to product specification and concept generation.

LOCAL NEEDS

REGIONAL NEEDS

NATIONAL NEEDS

GLOBAL NEEDS

		<ul style="list-style-type: none"> • Understanding the different approaches used across various PD methodologies and its tools, methods and techniques. • Understand the principles behind product modularization, to be able to understand intellectual property issues in product development.
19254E52BP	Fluid Power Automation	<ul style="list-style-type: none"> • Impart the knowledge to basic fluid power terms, units and fluid power graphic symbols, components and Aware of the importance and the scope of hydraulics and pneumatics in the modern industry. • Recognize the suitable pump and actuators for particular application. • Select various control valves such as pressure control, flow control, direction control valves and use them in hydraulic and pneumatic circuit development. • Designing the hydraulic and pneumatic circuits using ladder diagram and Analyze the hydraulic and pneumatic circuit for energy efficiency. • Select the appropriate control system like electrical, electronics, and PLC to control the fluid power system and Trouble-shoot and identify maintenance problems associated with fluid power system
19254E53AP	Advanced Material Technology	<ul style="list-style-type: none"> • Relate the mechanical properties of materials to their structure and solve realistic and/or fundamental problems relating to the mechanical behavior of materials for individual solutions and tests. • Express the information about fundamental conceptions of fracture mechanics with his/her own sentences and Calculates and interprets mechanical properties using Griffith equation. • Understand the students a thorough systematic approach to the selection of metals, ceramics, polymers, and composites required for mechanical design. Familiarize the students with material properties and materials fabrication processes and an approach for selecting a process capable of producing a component possessing the size, shape, properties, and cost dictated by the design. • Develop new materials and technologies and detect causes of the production defects and breaking of the metallic constructions during operation. • Acquired basic and advanced engineering knowledge about ceramics, polymers and polymers matrix composite and understand the mechanical, optical, thermal and electrical properties of these materials.
19254E53BP	Industrial Ergonomics	<ul style="list-style-type: none"> • Analyze and calculate the level of risk in a job causing stress, fatigue and musculoskeletal disorders and design appropriate work systems.

LOCAL NEEDS

REGIONAL NEEDS

NATIONAL NEEDS

GLOBAL NEEDS

- Be aware of the application of Mannequins in Ergonomics in the past, understand the concept and importance of Anthropometry, gain practical experience in collecting anthropometric data and learn the applications of Anthropometry.
- Design a system, component, or process to meet accepted human factors and workplace ergonomics standards within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.
- Assess the occupational environmental factors like heat stress, noise, and vibration and RSPM level in the industry.
- Understand how these separate systems interact to yield integrated physiological responses to challenges such as exercise, fasting and ascent to high altitude, and how they can sometimes fail.

LOCAL NEEDS

REGIONAL NEEDS

NATIONAL NEEDS

GLOBAL NEEDS

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

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF MECHANICAL ENGINEERING

B.TECH - FULL TIME (UG - 2019)

COURSE CODE	COURSE TITLE	CO	COURSE OUTCOMES	PO1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9
19147S11	COMMUNICATIVE ENGLISH	CO1	Read articles of a general kind in magazines and newspapers.							✓		
		CO2	Participate effectively in informal conversations; introduce themselves and their friends and express opinions in English.							✓		
		CO3	Comprehend conversations and short talks delivered in English							✓		
		CO4	Write short essays of a general kind and personal letters and emails in English.							✓		
19148S12	ENGINEERING MATHEMATICS – I	CO1	Use both the limit definition and rules of differentiation to differentiate functions.	✓								
		CO2	Apply differentiation to solve maxima and minima problems.		✓							
		CO3	Evaluate integrals both by using Riemann sums and by using the Fundamental Theorem of Calculus.			✓						
		CO4	Apply integration to compute multiple integrals, area, volume, integrals in polar coordinates, in addition to change of order and				✓					✓

			change of variables.										
		CO5	Evaluate integrals using techniques of integration, such as substitution, partial fractions and integration by parts.				✓						
		CO6	Determine convergence/divergence of improper integrals and evaluate convergent improper integrals.	✓									
		CO7	Apply various techniques in solving differential equations.					✓					
19149S13	ENGINEERING PHYSICS	CO1	the students will gain knowledge on the basics of properties of matter and its applications,	✓									
		CO2	the students will acquire knowledge on the concepts of waves and optical devices and their applications in fibre optics,		✓								
		CO3	the students will have adequate knowledge on the concepts of thermal properties of materials and their applications in expansion joints and heat exchangers,				✓						
		CO4	the students will get knowledge on advanced physics concepts of quantum theory and its applications in tunneling										✓

			microscopes, and										
		CO5	the students will understand the basics of crystals, their structures and different crystal growth techniques.				✓						
19149S14	ENGINEERING CHEMISTRY	CO1	The knowledge gained on engineering materials, fuels, energy sources and water treatment techniques will facilitate better understanding of engineering processes and applications for further learning.				✓						
19154S15	ENGINEERING GRAPHICS	CO1	familiarize with the fundamentals and standards of Engineering graphics		✓								
		CO2	perform freehand sketching of basic geometrical constructions and multiple views of objects.			✓							
		CO3	project orthographic projections of lines and plane surfaces.							✓			
		CO4	draw projections and solids and development of surfaces.			✓							
		CO5	visualize and to project isometric and perspective sections of simple solids.				✓						
19150S16	PROBLEM SOLVING AND PYTHON PROGRAMMING	CO1	Develop algorithmic solutions to simple computational problems					✓					

		CO2	Read, write, execute by hand simple Python programs.					✓				
		CO3	Structure simple Python programs for solving problems.					✓				
		CO4	Decompose a Python program into functions.					✓				
		CO5	Represent compound data using Python lists, tuples, dictionaries.					✓				
		CO6	Read and write data from/to files in Python Programs.					✓				
19150L17	PROBLEM SOLVING AND PYTHON PROGRAMMING LABORATORY	CO1	Write, test, and debug simple Python programs.			✓						
		CO2	Implement Python programs with conditionals and loops.					✓				
		CO3	Develop Python programs step-wise by defining functions and calling them.				✓					
		CO4	Use Python lists, tuples, dictionaries for representing compound data.		✓							
		CO5	Read and write data from/to files in Python.	✓								
19150L18	PHYSICS AND CHEMISTRY LABORATORY	CO1	apply principles of elasticity, optics and thermal properties for engineering applications.			✓						
19147S21	TECHNICAL ENGLISH	CO1	Read technical texts and write area- specific texts effortlessly.							✓		

		CO2	Listen and comprehend lectures and talks in their area of specialisation successfully.								✓		
		CO3	Speak appropriately and effectively in varied formal and informal contexts.								✓		
		CO4	Write reports and winning job applications.								✓		
19148S22	ENGINEERING MATHEMATICS – II	CO1	Eigen values and eigenvectors, diagonalization of a matrix, Symmetric matrices, Positive definite matrices and similar matrices.	✓									
		CO2	Gradient, divergence and curl of a vector point function and related identities.		✓								
		CO3	Evaluation of line, surface and volume integrals using Gauss, Stokes and Green's theorems and their verification.			✓							
		CO4	Analytic functions, conformal mapping and complex integration.								✓		
		CO5	Laplace transform and inverse transform of simple functions, properties, various related theorems and application to differential equations with constant coefficients.										✓

19149S23C	MATERIALS SCIENCE	CO1	the students will have knowledge on the various phase diagrams and their applications				✓					
		CO2	the students will acquire knowledge on Fe-Fe ₃ C phase diagram, various microstructures and alloys				✓					
		CO3	the students will get knowledge on mechanical properties of materials and their measurement							✓		
		CO4	the students will gain knowledge on magnetic, dielectric and superconducting properties of materials							✓		
		CO5	the students will understand the basics of ceramics, composites and nanomaterials.							✓		
19149S24A	ENVIRONMENTAL SCIENCE AND ENGINEERING	CO1	Environmental Pollution or problems cannot be solved by mere laws. Public participation is an important aspect which serves the environmental Protection. One will obtain knowledge on the following after completing the course.				✓					
		CO2	Public awareness of environmental is at infant stage.				✓					
		CO3	Ignorance and incomplete knowledge has lead to misconceptions				✓					

		CO4	Development and improvement in std. of living has lead to serious environmental disasters				✓					
19153S25D	BASIC ELECTRICAL ELECTRONICS AND INSTRUMENTATION ENGINEERING	CO1	Understand electric circuits and working principles of electrical machines				✓					
		CO2	Understand the concepts of various electronic devices				✓					
		CO3	Choose appropriate instruments for electrical measurement for a specific application								✓	
19154S26D	ENGINEERING MECHANICS	CO1	illustrate the vectorial and scalar representation of forces and moments	✓								
		CO2	analyse the rigid body in equilibrium		✓							
		CO3	evaluate the properties of surfaces and solids							✓		
		CO4	calculate dynamic forces exerted in rigid body								✓	
		CO5	determine the friction and the effects by the laws of friction									✓
19154L27	ENGINEERING PRACTICES LABORATORY	CO1	fabricate carpentry components and pipe connections including plumbing works.			✓						
		CO2	use welding equipments to join the structures.			✓						
		CO3	Carry out the basic machining operations			✓						
		CO4	Make the models using sheet			✓						

			metal works											
		CO5	Illustrate on centrifugal pump, Air conditioner, operations of smithy, foundary and fittings			✓								
		CO6	Carry out basic home electrical works and appliances			✓								
		CO7	Measure the electrical quantities			✓								
		CO8	Elaborate on the components, gates, soldering practices.			✓								
19153L28D	BASIC ELECTRICAL, ELECTRONICS AND INSTRUMENTATION ENGINEERING LABORATORY	CO1	Ability to determine the speed characteristic of different electrical machines			✓								
		CO2	Ability to design simple circuits involving diodes and transistors			✓								
		CO3	Ability to use operational amplifiers			✓								
19148S31C	TRANSFORMS AND PARTIAL DIFFERENTIAL EQUATIONS	CO1	Understand how to solve the given standard partial differential equations.	✓										
		CO2	Solve differential equations using Fourier series analysis which plays a vital role in engineering applications.		✓									
		CO3	Appreciate the physical significance of Fourier series techniques in solving one and two dimensional heat flow problems and one dimensional wave equations.			✓								

		CO4	Understand the mathematical principles on transforms and partial differential equations would provide them the ability to formulate and solve some of the physical problems of engineering.								✓	
		CO5	Use the effective mathematical tools for the solutions of partial differential equations by using Z transform techniques for discrete time systems.									✓
19154C32	ENGINEERING THERMODYNAMICS	CO1	Apply the first law of thermodynamics for simple open and closed systems under steady and unsteady conditions.	✓								
		CO2	Apply second law of thermodynamics to open and closed systems and calculate entropy and availability.		✓							
		CO3	Apply Rankine cycle to steam power plant and compare few cycle improvement methods			✓						
		CO4	Derive simple thermodynamic relations of ideal and real gases						✓			
		CO5	Calculate the properties of gas mixtures and moist air and its use in psychometric processes								✓	
19154C33	FLUID MECHANICS AND MACHINERY	CO1	Apply mathematical knowledge to predict the properties and characteristics of a fluid.	✓								

		CO2	Can analyse and calculate major and minor losses associated with pipe flow in piping networks.		✓								
		CO3	Can mathematically predict the nature of physical quantities			✓							
		CO4	Can critically analyse the performance of pumps				✓						
		CO5	Can critically analyse the performance of turbines.					✓					
19154C34	PRODUCTION TECHNOLOGY – I	CO1	Explain different metal casting processes, associated defects, merits and demerits			✓							
		CO2	Compare different metal joining processes.				✓						
		CO3	Summarize various hot working and cold working methods of metals.					✓					
		CO4	Explain various sheet metal making processes.						✓				
		CO5	Distinguish various methods of manufacturing plastic components.									✓	
19154C35	ELECTRICAL DRIVES AND CONTROLS	CO1	Upon Completion of this subject, the students can able to explain different types of electrical machines and their performance	✓									
19154L36	PRODUCTION TECHNOLOGY LABORATORY – I	CO1	Demonstrate the safety precautions exercised in the mechanical workshop.			✓							

		CO2	Make the workpiece as per given shape and size using Lathe.				✓						
		CO3	Join two metals using arc welding.					✓					
		CO4	Use sheet metal fabrication tools and make simple tray and funnel.						✓				
		CO5	Use different moulding tools, patterns and prepare sand moulds.								✓		
19154L37	COMPUTER AIDED MACHINE DRAWING	CO1	Follow the drawing standards, Fits and Tolerances			✓							
		CO2	Re-create part drawings, sectional views and assembly drawings as per standards				✓						
19154L38	ELECTRICAL ENGINEERING LABORATORY	CO1	Ability to perform speed characteristic of different electrical machine			✓							
19154L39	INTERPERSONAL SKILLS/LISTENING & SPEAKING	CO1	Listen and respond appropriately.			✓							
		CO2	Participate in group discussions			✓							
		CO3	Make effective presentations			✓							
		CO4	Participate confidently and appropriately in conversations both formal and informal			✓							
19148C41D	STATISTICS AND NUMERICAL METHODS	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.				✓						
		CO5	Solve the partial and ordinary differential equations with initial and boundary conditions by using certain techniques with engineering applications					✓					
19154C42	THEORY OF MACHINES-I	CO1	Discuss the basics of mechanism	✓									
		CO2	Calculate velocity and acceleration in simple mechanisms		✓								
		CO3	Develop CAM profiles			✓							
		CO4	Solve problems on gears and gear trains					✓					
		CO5	Examine friction in machine elements					✓					
19154C43	PRODUCTION TECHNOLOGY – II	CO1	Explain the mechanism of material removal processes.	✓									

		CO2	Describe the constructional and operational features of centre lathe and other special purpose lathes.				✓						
		CO3	Describe the constructional and operational features of shaper, planner, milling, drilling, sawing and broaching machines.					✓					
		CO4	Explain the types of grinding and other super finishing processes apart from gear manufacturing processes.						✓				
		CO5	Summarize numerical control of machine tools and write a part program.									✓	
19154C44	ENGINEERING METALLURGY	CO1	Explain alloys and phase diagram, Iron-Iron carbon diagram and steel classification.									✓	
		CO2	Explain isothermal transformation, continuous cooling diagrams and different heat treatment processes.									✓	
		CO3	Clarify the effect of alloying elements on ferrous and non-ferrous metals									✓	
		CO4	Summarize the properties and applications of non metallic materials.									✓	
		CO5	Explain the testing of mechanical properties. .									✓	

19154C45	STRENGTH OF MATERIALS FOR MECHANICAL ENGINEERS	CO1	Understand the concepts of stress and strain in simple and compound bars, the importance of principal stresses and principal planes.	✓											
		CO2	Understand the load transferring mechanism in beams and stress distribution due to shearing force and bending moment.		✓										
		CO3	Apply basic equation of simple torsion in designing of shafts and helical spring			✓									
		CO4	Calculate the slope and deflection in beams using different methods.				✓								
		CO5	Analyze and design thin and thick shells for the applied internal and external pressures.					✓							
19154C46	THERMAL ENGINEERING - I	CO1	Apply thermodynamic concepts to different air standard cycles and solve problems.	✓											
		CO2	Solve problems in single stage and multistage air compressors		✓										
		CO3	Explain the functioning and features of IC engines, components and auxiliaries.					✓							
		CO4	Calculate performance parameters of IC Engines.			✓									
		CO5	Explain the flow in Gas turbines and solve problems.				✓								

19154L47	PRODUCTION TECHNOLOGY LABORATORY – II	CO1	use different machine tools to manufacturing gears			✓						
		CO2	Ability to use different machine tools to manufacturing gears.			✓						
		CO3	Ability to use different machine tools for finishing operations			✓						
		CO4	Ability to manufacture tools using cutter grinder			✓						
		CO5	Develop CNC part programming			✓						
19154L48	STRENGTH OF MATERIALS AND FLUID MECHANICS AND MACHINERY LABORATORY	CO1	Ability to perform Tension, Torsion, Hardness, Compression, and Deformation test on Solid materials.					✓				
		CO2	Perform Tension, Torsion, Hardness, Compression, and Deformation test on Solid materials.					✓				
		CO3	Use the measurement equipments for flow measurement.					✓				
		CO4	Perform test on different fluid machinery.					✓				
19154L 49	ADVANCED READING AND WRITING	CO1	Write different types of essays.						✓			
		CO2	Write winning job applications.						✓			
		CO3	Read and evaluate texts critically.									✓

		CO4	Display critical thinking in various professional contexts.										✓
19154C51	THERMAL ENGINEERING – II	CO1	Solve problems in Steam Nozzle	✓									
		CO2	Explain the functioning and features of different types of Boilers and auxiliaries and calculate performance parameters.		✓								
		CO3	Explain the flow in steam turbines, draw velocity diagrams for steam turbines and solve problems.					✓					
		CO4	Summarize the concept of Cogeneration, Working features of Heat pumps and Heat Exchangers									✓	
		CO5	Solve problems using refrigerant table / charts and psychrometric charts									✓	
19154C52	DESIGN OF MACHINE ELEMENTS	CO1	Explain the influence of steady and variable stresses in machine component design.		✓								
		CO2	Apply the concepts of design to shafts, keys and couplings.				✓						
		CO3	Apply the concepts of design to temporary and permanent joints.							✓			
		CO4	Apply the concepts of design to energy absorbing members, connecting rod and crank shaft.									✓	

		CO5	Apply the concepts of design to bearings.											✓
19154C53	METROLOGY AND MEASUREMENTS	CO1	Describe the concepts of measurements to apply in various metrological instruments	✓										
		CO2	Outline the principles of linear and angular measurement tools used for industrial Applications			✓								
		CO3	Explain the procedure for conducting computer aided inspection				✓							
		CO4	Demonstrate the techniques of form measurement used for industrial components							✓				
		CO5	Discuss various measuring techniques of mechanical properties in industrial applications									✓		
19155OE54B	GEOGRAPHIC INFORMATION SYSTEM	CO1	Understand the types of data models.											
		CO2	Get knowledge about data input and topology.											
		CO3	Gain knowledge on data quality and standards.											
		CO4	Understand data management functions and data output											
19154C55	THEORY OF MACHINES-II	CO1	Calculate static and dynamic forces of mechanisms.	✓										

		CO2	Calculate the balancing masses and their locations of reciprocating and rotating masses.		✓								
		CO3	Compute the frequency of free vibration.			✓							
		CO4	Compute the frequency of forced vibration and damping coefficient.					✓					
		CO5	Calculate the speed and lift of the governor and estimate the gyroscopic effect on automobiles, ships and airplanes.							✓			
19154L56	THEORY OF MACHINES LABORATORY	CO1	Explain gear parameters, kinematics of mechanisms, gyroscopic effect and working of lab equipments.	✓									
		CO2	Determine mass moment of inertia of mechanical element, governor effort and range sensitivity, natural frequency and damping coefficient, torsional frequency, critical speeds of shafts, balancing mass of rotating and reciprocating masses, and transmissibility ratio.		✓								
19154L57	THERMAL ENGINEERING LABORATORY	CO1	conduct tests on heat conduction apparatus and evaluate thermal conductivity of materials.	✓									
		CO2	conduct tests on natural and forced convective heat transfer apparatus and evaluate heat		✓								

			transfer coefficient.										
		CO3	conduct tests on radiative heat transfer apparatus and evaluate Stefan Boltzmann constant and emissivity.			✓							
		CO4	conduct tests to evaluate the performance of parallel/counter flow heat exchanger apparatus and reciprocating air compressor.				✓						
		CO5	conduct tests to evaluate the performance of refrigeration and airconditioning test rigs.					✓					
19154L58	METROLOGY AND MEASUREMENTS LABORATORY	CO1	Measure the gear tooth dimensions, angle using sine bar, straightness and flatness, thread parameters, temperature using thermocouple, force, displacement, torque and vibration.	✓									
		CO2	Calibrate the vernier, micrometer and slip gauges and setting up the comparator for the inspection.		✓								
19154C61	DESIGN OF TRANSMISSION SYSTEMS	CO1	apply the concepts of design to belts, chains and rope drives.		✓								
		CO2	apply the concepts of design to spur, helical gears.				✓						

		CO3	apply the concepts of design to worm and bevel gears.								✓		
		CO4	apply the concepts of design to gear boxes .								✓		
		CO5	apply the concepts of design to cams, brakes and clutches										✓
19154C62	COMPUTER AIDED DESIGN AND MANUFACTURING	CO1	Explain the 2D and 3D transformations, clipping algorithm, Manufacturing models and Metrics		✓								
		CO2	Explain the fundamentals of parametric curves, surfaces and Solids			✓							
		CO3	Summarize the different types of Standard systems used in CAD					✓					
		CO4	Apply NC & CNC programming concepts to develop part programme for Lathe & Milling Machines							✓			
		CO5	Summarize the different types of techniques used in Cellular Manufacturing and FMS				✓						
19154C63	HEAT AND MASS TRANSFER	CO1	Apply heat conduction equations to different surface configurations under steady state and transient conditions and solve problems	✓									
		CO2	Apply free and forced convective heat transfer correlations to internal and external flows through/over various surface configurations and solve		✓								

			problems										
		CO3	Explain the phenomena of boiling and condensation, apply LMTD and NTU methods of thermal analysis to different types of heat exchanger configurations and solve problems			✓							
		CO4	Explain basic laws for Radiation and apply these principles to radiative heat transfer between different types of surfaces to solve problems				✓						
		CO5	Apply diffusive and convective mass transfer equations and correlations to solve problems for different applications									✓	
19154C64	FINITE ELEMENT ANALYSIS	CO1	Summarize the basics of finite element formulation.	✓									
		CO2	Apply finite element formulations to solve one dimensional Problems.		✓								
		CO3	Apply finite element formulations to solve two dimensional scalar Problems.				✓						
		CO4	Apply finite element method to solve two dimensional Vector problems.										✓

19154L67	CAD / CAM LABORATORY	CO1	Draw 3D and Assembly drawing using CAD software	✓										
		CO2	Demonstrate manual part programming with G and M codes using CAM		✓									
19154L68	DESIGN AND FABRICATION PROJECT	CO1	design and Fabricate the machine element or the mechanical product.						✓					
		CO2	demonstrate the working model of the machine element or the mechanical product.								✓			
19154L69	PROFESSIONAL COMMUNICATION	CO1	Make effective presentations				✓							
		CO2	Participate confidently in Group Discussions.					✓						
		CO3	Attend job interviews and be successful in them.						✓					
		CO4	Develop adequate Soft Skills required for the workplace								✓			
19154C71	POWER PLANT ENGINEERING	CO1	Explain the layout, construction and working of the components inside a thermal power plant.	✓										
		CO2	Explain the layout, construction and working of the components inside a Diesel, Gas and Combined cycle power plants.		✓									
		CO3	Explain the layout, construction and working of the components inside nuclear power plants.			✓								

		CO4	Explain the layout, construction and working of the components inside Renewable energy power plants.				✓						
		CO5	Explain the applications of power plants while extend their knowledge to power plant economics and environmental hazards and estimate the costs of electrical energy production.								✓		
19154C72	PROCESS PLANNING AND COST ESTIMATION	CO1	select the process, equipment and tools for various industrial products.	✓									
		CO2	prepare process planning activity chart.		✓								
		CO3	explain the concept of cost estimation.			✓							
		CO4	compute the job order cost for different type of shop floor.				✓						
		CO5	calculate the machining time for various machining operations.								✓		
19154C73	MECHATRONICS	CO1	Discuss the interdisciplinary applications of Electronics, Electrical, Mechanical and Computer Systems for the Control of Mechanical, Electronic Systems and sensor technology.	✓									
		CO2	Discuss the architecture of Microprocessor and Microcontroller, Pin Diagram, Addressing Modes of		✓								

			Microprocessor and Microcontroller.										
		CO3	Discuss Programmable Peripheral Interface, Architecture of 8255 PPI, and various device Interfacing			✓							
		CO4	Explain the architecture, programming and application of programmable logic controllers to problems and challenges in the areas of Mechatronic engineering.					✓					
		CO5	Discuss various Actuators and Mechatronics system using the knowledge and skills acquired through the course and also from the given case studies					✓					
19154E75A	RENEWABLE SOURCES OF ENERGY	CO1	Discuss the importance and Economics of renewable Energy	✓									
		CO2	Discuss the method of power generation from Solar Energy		✓								
		CO3	Discuss the method of power generation from Wind Energy			✓							
		CO4	Explain the method of power generation from Bio Energy								✓		
		CO5	Explain the Tidal energy, Wave Energy, OTEC, Hydro energy, Geothermal Energy, Fuel										✓

19154E76A	ROBOTICS	CO1	Cells and Hybrid Systems.	✓										
		CO2	Illustrate the different types of robot drive systems as well as robot end effectors.		✓									
		CO3	Apply the different sensors and image processing techniques in robotics to improve the ability of robots.			✓								
		CO4	Develop robotic programs for different tasks and familiarize with the kinematics motions of robot.					✓						
		CO5	Examine the implementation of robots in various industrial sectors and interpolate the economic analysis of robots.									✓		
19155FE74B	WASTE WATER TREATMENT	CO1	Will have knowledge about adsorption and oxidation process.	✓										
		CO2	Will gain idea about various methods available for water treatment.		✓									
		CO3	Will appreciate the necessity of water and acquire knowledge of preliminary treatment.			✓								
19154L77	SIMULATION AND ANALYSIS LABORATORY	CO1	simulate the working principle of air conditioning system, hydraulic and pneumatic cylinder and cam follower mechanisms using MATLAB.	✓										

		CO2	analyze the stresses and strains induced in plates, brackets and beams and heat transfer problems.						✓				
		CO3	calculate the natural frequency and mode shape analysis of 2D components and beams.							✓			
19154L78	MECHATRONICS LABORATORY	CO1	Demonstrate the functioning of mechatronics system with various pneumatic, hydraulic and electrical systems.	✓									
		CO2	Demonstrate the functioning of control systems with the help of PLC and microcontrollers.		✓								
19154L79	TECHNICAL SEMINAR	CO1	To enrich the communication skills of the student and presentations of technical topics of interest, this course is introduced.	✓									
19154S81	PRINCIPLES OF MANAGEMENT	CO1	Upon completion of the course, students will be able to have clear understanding of managerial functions like planning, organizing, staffing, leading & controlling and have same basic knowledge on international aspect of management						✓				
19154E82A	PRODUCTION PLANNING AND CONTROL	CO1	Upon completion of this course, the students can able to prepare production planning and control activities such as work	✓									

			study, product planning, production scheduling, Inventory Control.										
		CO2	They can plan manufacturing requirements manufacturing requirement Planning (MRP II) and Enterprise Resource Planning (ERP).		✓								
19154P83	PROJECT WORK	CO1	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.	✓									

DEPARTMENT OF MECHANICAL ENGINEERING

B.TECH - PART TIME (UG - 2019)

COURSE CODE	COURSE TITLE	CO	COURSE OUTCOMES	PO1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9
19148C11P	TRANSFORMS AND PARTIAL DIFFERENTIAL EQUATIONS	CO 1	Understand how to solve the given standard partial differential equations.	✓								
		CO 2	Solve differential equations using Fourier series analysis which plays a vital role in engineering applications.		✓							
		CO 3	Appreciate the physical significance of Fourier series techniques in solving one and two dimensional heat flow problems			✓						

			and one dimensional wave equations.										
		CO 4	Understand the mathematical principles on transforms and partial differential equations would provide them the ability to formulate and solve some of the physical problems of engineering.									✓	
		CO 5	Use the effective mathematical tools for the solutions of partial differential equations by using Z transform techniques for discrete time systems.										✓
19153C12P	ELECTRICAL DRIVES AND CONTROLS	CO 1	Upon Completion of this subject, the students can able to explain different types of electrical machines and their performance	✓									
19154C13P	ENGINEERING THERMODYNAMICS	CO 1	Apply the first law of thermodynamics for simple open and closed systems under steady and unsteady conditions.	✓									
		CO 2	Apply second law of thermodynamics to open and closed systems and calculate entropy and availability.		✓								
		CO 3	Apply Rankine cycle to steam power plant and compare few cycle improvement methods			✓							

		CO 4	Derive simple thermodynamic relations of ideal and real gases								✓		
		CO 5	Calculate the properties of gas mixtures and moist air and its use in psychometric processes									✓	
19154C14P	FLUID MECHANICS AND MACHINERY	CO 1	Apply mathematical knowledge to predict the properties and characteristics of a fluid.	✓									
		CO 2	Can analyse and calculate major and minor losses associated with pipe flow in piping networks.		✓								
		CO 3	Can mathematically predict the nature of physical quantities			✓							
		CO 4	Can critically analyse the performance of pumps				✓						
		CO 5	Can critically analyse the performance of turbines.					✓					
19154C15P	FOUNDRY AND WELDING TECHNOLOGY	CO 1	Explain different metal casting processes, associated defects, merits and demerits			✓							
		CO 2	Compare different metal joining processes.				✓						
		CO 3	Summarize various hot working and cold working methods of metals.					✓					
		CO 4	Explain various sheet metal making processes.						✓				
		CO 5	Distinguish various methods of manufacturing plastic components.									✓	

19148S21P	NUMERICAL METHODS	CO 1	Apply the concept of testing of hypothesis for small and large samples in real life problems.	✓												
		CO 2	Apply the basic concepts of classifications of design of experiments in the field of agriculture.		✓											
		CO 3	Appreciate the numerical techniques of interpolation in various intervals and apply the numerical techniques of differentiation and integration for engineering problems.			✓										
		CO 4	Understand the knowledge of various techniques and methods for solving first and second order ordinary differential equations.				✓									
		CO 5	Solve the partial and ordinary differential equations with initial and boundary conditions by using certain techniques with engineering applications					✓								
19154C22P	MACHINE TOOL TECHNOLOGY	CO 1	Explain the mechanism of material removal processes.	✓												
		CO 2	Describe the constructional and operational features of centre lathe and other special purpose lathes.			✓										
		CO 3	Describe the constructional and operational features of shaper, planner, milling, drilling, sawing and broaching machines.				✓									

		CO 4	Explain the types of grinding and other super finishing processes apart from gear manufacturing processes.					✓				
		CO 5	Summarize numerical control of machine tools and write a part program.							✓		
19154C23P	THERMAL ENGINEERING	CO 1	Apply thermodynamic concepts to different air standard cycles and solve problems.	✓								
		CO 2	Solve problems in single stage and multistage air compressors		✓							
		CO 3	Explain the functioning and features of IC engines, components and auxiliaries.					✓				
		CO 4	Calculate performance parameters of IC Engines.			✓						
		CO 5	Explain the flow in Gas turbines and solve problems.				✓					
19154C24P	STRENGTH OF MATERIALS	CO 1	Understand the concepts of stress and strain in simple and compound bars, the importance of principal stresses and principal planes.	✓								
		CO 2	Understand the load transferring mechanism in beams and stress distribution due to shearing force and bending moment.		✓							
		CO 3	Apply basic equation of simple torsion in designing of shafts and helical spring			✓						

		CO 4	Calculate the slope and deflection in beams using different methods.				✓						
		CO 5	Analyze and design thin and thick shells for the applied internal and external pressures.					✓					
19154C25P	ENGINEERING MATERIALS AND METALLURGY	CO 1	Explain alloys and phase diagram, Iron-Iron carbon diagram and steel classification.							✓			
		CO 2	Explain isothermal transformation, continuous cooling diagrams and different heat treatment processes.							✓			
		CO 3	Clarify the effect of alloying elements on ferrous and non-ferrous metals								✓		
		CO 4	Summarize the properties and applications of non metallic materials.								✓		
		CO 5	Explain the testing of mechanical properties. .								✓		
19148S31CP	PROBABILITY AND STATISTICS	CO 1	The main objective of this course is to provide students with the foundations of probabilistic and statistical analysis mostly used in varied applications in engineering and science like disease modeling, climate prediction and computer networks etc.	✓									
19154C32P	KINEMATICS OF MACHINERY	CO 1	Discuss the basics of mechanism	✓									
		CO 2	Calculate velocity and acceleration in simple mechanisms		✓								

		CO 3	Develop CAM profiles			✓							
		CO 4	Solve problems on gears and gear trains					✓					
		CO 5	Examine friction in machine elements					✓					
19154C33P	PRODUCTION PLANNING AND CONTROL	CO 1	Upon completion of this course, the students can able to prepare production planning and control activities such as work study, product planning, production scheduling, Inventory Control.	✓									
		CO 2	They can plan manufacturing requirements manufacturing requirement Planning (MRP II) and Enterprise Resource Planning (ERP).		✓								
19154C34P	ENGINEERING METROLOGY AND MEASUREMENTS	CO 1	Describe the concepts of measurements to apply in various metrological instruments	✓									
		CO 2	Outline the principles of linear and angular measurement tools used for industrial Applications			✓							
		CO 3	Explain the procedure for conducting computer aided inspection				✓						
		CO 4	Demonstrate the techniques of form measurement used for industrial components								✓		

		CO 5	Discuss various measuring techniques of mechanical properties in industrial applications										✓	
19154L35P	COMPUTER AIDED SIMULATION AND ANALYSIS LABORATORY	CO 1	simulate the working principle of air conditioning system, hydraulic and pneumatic cylinder and cam follower mechanisms using MATLAB.	✓										
		CO 2	analyze the stresses and strains induced in plates, brackets and beams and heat transfer problems.					✓						
		CO 3	calculate the natural frequency and mode shape analysis of 2D components and beams.							✓				
19154C41P	POWER PLANT ENGINEERING	CO 1	Explain the layout, construction and working of the components inside a thermal power plant.	✓										
		CO 2	Explain the layout, construction and working of the components inside a Diesel, Gas and Combined cycle power plants.		✓									
		CO 3	Explain the layout, construction and working of the components inside nuclear power plants.			✓								
		CO 4	Explain the layout, construction and working of the components inside Renewable energy power plants.				✓							

		CO 5	Explain the applications of power plants while extend their knowledge to power plant economics and environmental hazards and estimate the costs of electrical energy production.									✓	
19154C42P	DYNAMICS OF MACHINERY	CO 1	Discuss the basics of mechanism	✓									
		CO 2	Calculate velocity and acceleration in simple mechanisms		✓								
		CO 3	Develop CAM profiles			✓							
		CO 4	Solve problems on gears and gear trains					✓					
		CO 5	Examine friction in machine elements					✓					
19154C43P	DESIGN OF MACHINE ELEMENTS	CO 1	Explain the influence of steady and variable stresses in machine component design.		✓								
		CO 2	Apply the concepts of design to shafts, keys and couplings.				✓						
		CO 3	Apply the concepts of design to temporary and permanent joints.							✓			
		CO 4	Apply the concepts of design to energy absorbing members, connecting rod and crank shaft.								✓		
		CO 5	Apply the concepts of design to bearings.										✓
19154E44DP	RENEWABLE SOURCES OF ENERGY	CO 1	Understand the need of energy conversion and the various methods of energy storage	✓									

		CO 2	Identify Winds energy as alternate form of energy and to know how it can be tapped		✓								
		CO 3	Understand the Geothermal & Tidal energy, its mechanism of production and its applications			✓							
19154L45P	DYNAMICS LABORATORY	CO 1	Explain gear parameters, kinematics of mechanisms, gyroscopic effect and working of lab equipments.	✓									
		CO 2	Determine mass moment of inertia of mechanical element, governor effort and range sensitivity, natural frequency and damping coefficient, torsional frequency, critical speeds of shafts, balancing mass of rotating and reciprocating masses, and transmissibility ratio.			✓							
19154C51P	HEAT AND MASS TRANSFER	CO 1	Apply heat conduction equations to different surface configurations under steady state and transient conditions and solve problems	✓									
		CO 2	Apply free and forced convective heat transfer correlations to internal and external flows through/over various surface configurations and solve problems			✓							

		CO 3	Explain the phenomena of boiling and condensation, apply LMTD and NTU methods of thermal analysis to different types of heat exchanger configurations and solve problems			✓							
		CO 4	Explain basic laws for Radiation and apply these principles to radiative heat transfer between different types of surfaces to solve problems				✓						
		CO 5	Apply diffusive and convective mass transfer equations and correlations to solve problems for different applications								✓		
19154C52P	DESIGN OF TRANSMISSION SYSTEMS	CO 1	apply the concepts of design to belts, chains and rope drives.		✓								
		CO 2	apply the concepts of design to spur, helical gears.				✓						
		CO 3	apply the concepts of design to worm and bevel gears.							✓			
		CO 4	apply the concepts of design to gear boxes .							✓			
		CO 5	apply the concepts of design to cams, brakes and clutches										✓
19154C53P	AUTOMOBILE ENGINEERING	CO 1	recognize the various parts of the automobile and their functions and materials.	✓									
		CO 2	discuss the engine auxiliary systems and engine emission control.		✓								

		CO 3	distinguish the working of different types of transmission systems.			✓							
		CO 4	explain the Steering, Brakes and Suspension Systems.				✓						
		CO 5	predict possible alternate sources of energy for IC Engines.	✓									
19154E54CP	ROBOTICS	CO 1	Demonstrate knowledge of industrial robots, characteristics, end effectors and actuators.										
		CO 2	Apply spatial transformation to obtain forward and inverse kinematics										
		CO 3	Solve robot dynamics problems, generate joint trajectory for path planning										
		CO 4	Describe working principle of various sensors and program different operations										
		CO 5	Appreciate applications of robots in industry.										
19154L55P	HEAT TRANSFER LABORATORY	CO 1	conduct tests on heat conduction apparatus and evaluate thermal conductivity of materials.	✓									
		CO 2	conduct tests on natural and forced convective heat transfer apparatus and evaluate heat transfer coefficient.		✓								
		CO 3	conduct tests on radiative heat transfer apparatus and evaluate Stefan Boltzmann constant and emissivity.			✓							

		CO 4	conduct tests to evaluate the performance of parallel/counter flow heat exchanger apparatus and reciprocating air compressor.				✓					
		CO 5	conduct tests to evaluate the performance of refrigeration and airconditioning test rigs.					✓				
19154C61P	FINITE ELEMENT ANALYSIS	CO 1	Summarize the basics of finite element formulation.	✓								
		CO 2	Apply finite element formulations to solve one dimensional Problems.		✓							
		CO 3	Apply finite element formulations to solve two dimensional scalar Problems.				✓					
		CO 4	Apply finite element method to solve two dimensional Vector problems.									✓
		CO 5	Apply finite element method to solve problems on iso parametric element and dynamic Problems.									✓
19154C62P	MECHATRONICS	CO 1	Discuss the interdisciplinary applications of Electronics, Electrical, Mechanical and Computer Systems for the Control of Mechanical, Electronic Systems and sensor technology.	✓								
		CO 2	Discuss the architecture of Microprocessor and Microcontroller, Pin Diagram, Addressing Modes of			✓						

			Microprocessor and Microcontroller.										
		CO 3	Discuss Programmable Peripheral Interface, Architecture of 8255 PPI, and various device Interfacing			✓							
		CO 4	Explain the architecture, programming and application of programmable logic controllers to problems and challenges in the areas of Mechatronic engineering.					✓					
		CO 5	Discuss various Actuators and Mechatronics system using the knowledge and skills acquired through the course and also from the given case studies					✓					
19154C63P	COMPUTER INTEGRATED MANUFACTURING	CO 1	Explain the 2D and 3D transformations, clipping algorithm, Manufacturing models and Metrics		✓								
		CO 2	Explain the fundamentals of parametric curves, surfaces and Solids			✓							
		CO 3	Summarize the different types of Standard systems used in CAD					✓					
		CO 4	Apply NC & CNC programming concepts to develop part programme for Lathe & Milling Machines						✓				

		CO 5	Summarize the different types of techniques used in Cellular Manufacturing and FMS			✓							
19154E64AP	PRINCIPLES OF MANAGEMENT	CO 1	Upon completion of the course, students will be able to have clear understanding of managerial functions like planning, organizing, staffing, leading & controlling and have same basic knowledge on international aspect of management						✓				
19154L65P	MECHATRONICS LABORATORY	CO 1	Demonstrate the functioning of mechatronics system with various pneumatic, hydraulic and electrical systems.	✓									
		CO 2	Demonstrate the functioning of control systems with the help of PLC and microcontrollers.		✓								
19160S71P	TOTAL QUALITY MANAGEMENT	CO 1	To get familiarized with the basic concept and framework of Total Quality management										
		CO 2	To Understand the contribution of Quality Gurus in TQM Journey										
		CO 3	To grasp the nature and importance of various components that constitute TQM										
		CO 4	To describe and discuss the role of techniques used in TQM										
19154C72P	PROCESS PLANNING AND COST ESTIMATION	CO 1	select the process, equipment and tools for various industrial products.	✓									

		CO 2	prepare process planning activity chart.		✓								
		CO 3	explain the concept of cost estimation.			✓							
		CO 4	compute the job order cost for different type of shop floor.				✓						
		CO 5	calculate the machining time for various machining operations.								✓		
19154C73P	APPLIED HYDRAULICS AND PNEUMATICS	CO 1	Explain the Fluid power and operation of different types of pumps.	✓									
		CO 2	Summarize the features and functions of Hydraulic motors, actuators and Flow control Valves		✓								
		CO 3	Explain the different types of Hydraulic circuits and systems				✓						
		CO 4	Explain the working of different pneumatic circuits and systems									✓	
		CO 5	Summarize the various trouble shooting methods and applications of hydraulic and pneumatic systems.										✓
19154E74CP	UNCONVENTIONAL MACHINING PROCESSES	CO 1	Explain the need for unconventional machining processes and its classification	✓									
		CO 2	Compare various thermal energy and electrical energy based unconventional machining processes.		✓								

		CO 3	Summarize various chemical and electro-chemical energy based unconventional machining processes.			✓							
		CO 4	Explain various nano abrasives based unconventional machining processes.								✓		
		CO 5	Distinguish various recent trends based unconventional machining processes.									✓	
19154P75P	PROJECT WORK	CO 1	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.	✓									

DEPARTMENT OF MECHANICAL ENGINEERING

M.TECH - FULL TIME (PG - 2019)

COURSE CODE	COURSE TITLE	CO	COURSE OUTCOMES	PO1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9
19248S11E	ADVANCED ENGINEERING MATHEMATICS	CO 1	Understand Finite differences, interpolation techniques, Numerical differentiation and Integration and apply it to various practical problems	✓								
		CO 2	Apply Numerical methods to solve first order ordinary differential equations and Algebraic and Transcendental equations		✓							

		CO 3	Illustrate Laplace transform and its application in different fields			✓							
		CO 4	Apply Fourier transforms and its applications to solve Ordinary and Partial differential equations				✓						
		CO 5	Use Z-transform and its applications to solve difference equations					✓					
19254C12	THEORY OF METAL CUTTING	CO 1	Apply cutting mechanics to metal machining based on cutting force and power consumption.	✓									
		CO 2	Operate lathe, milling machines, drill press, grinding machines, etc.		✓								
		CO 3	Select cutting tool materials and tool geometries for different metals.	✓				✓					
		CO 4	Select appropriate machining processes and conditions for different metals.						✓				
		CO 5	Learn machine tool structures and machining economics.						✓				
19254C13	ADVANCED MANUFACTURING PROCESSES	CO 1	Able to understand different types of composite material characteristics, types of micro & macro machining processes.	✓									
		CO 2	Understand the e-manufacturing & nano materials.		✓								
19254C14	MECHANICAL METALLURGY	CO 1	Identify the properties of metals with respect to crystal structure and grain size			✓							

		CO 2	Interpret the phase diagrams of materials						✓			
		CO 3	Classify and Distinguish different types of cast irons, steels and non ferrous alloys	✓								
		CO 4	Describe the concept of heat treatment of steels & strengthening mechanisms	✓								
		CO 5	Explain the powder metallurgy process, types and manufacturing of composite materials									✓
19254C15	AUTOMATED COMPUTER INTEGRATED MANUFACTURING SYSTEMS	CO 1	to produce useful research output in computer integrated manufacturing					✓				
		CO 2	use this knowledge to develop computer techniques				✓					
		CO 3	Application of this knowledge to functionalise computer aided planning.				✓					
19254E16A	MATERIALS MANAGEMENT AND LOGISTICS	CO 1	Understanding basics of materials management						✓			
		CO 2	Understanding requirement analysis for material planning	✓								
		CO 3	Ability to apply inventory management models	✓								
		CO 4	Understanding purchasing practices					✓				
		CO 5	Understanding storage in warehouse					✓				
19254CRS	RESEARCH LED SEMINAR	CO 1	Understand research problem					✓				

			formulation.									
		CO 2	Analyze research related information		✓							
		CO 3	Follow research ethics		✓							
		CO 4	Understanding that when IPR would take such important place in growth of individuals & nation, it is needless to emphasis the need of information about Intellectual Property Right to be promoted among students in general & engineering in particular							✓		
		CO 5	Understand that today's world is controlled by Computer, Information Technology, but tomorrow world will be ruled by ideas, concept, and creativity						✓			
19254L17	CIM LAB	CO 1	To impart the knowledge on training the students in the area of CAD/CAM				✓					
19254C21	PRODUCTION MANAGEMENT	CO 1	Understand the role of operations management in achieving organizational competitiveness		✓							
		CO 2	Appreciate the concepts of lean production and maintenance management in operations	✓								
		CO 3	Comprehend key decision areas of operations and analyze data for effective decision making in operations management.		✓							

19254C22	MEMS AND NANO TECHNOLOGY	CO 1	Ability to understand the operation of micro devices, micro systems and their applications	✓										
		CO 2	Ability to design the micro devices, micro systems using the MEMS fabrication process.	✓										
		CO 3	Gain a knowledge of basic approaches for various sensor design		✓									
		CO 4	Gain a knowledge of basic approaches for various actuator design			✓								
19254C23	MANUFACTURING METROLOGY AND QUALITY CONTROL	CO 1	They can choose appropriate method and instruments for inspection of various gear elements and thread elements. They can understand the standards of length, angles, they can understand the evaluation of surface finish and measure the parts with various comparators. The quality of the machine tool with alignment test can also be evaluated by them.				✓							
19254E24B	LEAN MANUFACTURING	CO 1	The student will be able to practice the principles of lean manufacturing like customer focus, reduction of MUDA, just in time, Jidoka and Hoshin planning.	✓										

19254E25B	MAINTENANCE MANAGEMENT	CO 1	Explain maintenance objectives and functions, factors influencing Plant Availability, Need for maintenance plan and organization, Functions of maintenance control and determine Failure probability, Survival probability and Age specific failure rates of equipments and components.		✓								
		CO 2	Determine the optimal overhaul/repair/replacement maintenance policy for an equipment subject to breakdown and optimal interval between preventive replacements for individual and group replacement of equipments.			✓							
		CO 3	Explain different maintenance systems and the steps involved in establishing a maintenance plan and designing a technically sound preventive maintenance and lubrication program. (Comprehend)				✓						
		CO 4	Determine the optimal inspection frequency for maximization of profit and minimization of down time and the critical path using CPM and PERT	✓									

		CO 5	Explain the NUCREC method of prioritizing maintenance work, classification of spares and the costs associated with spares inventory, perform EOQ computations, explain MUSIC - 3D approach to spares management, determine the optimal number of spares to satisfy given service level and apply simulation technique for spares inventory.	✓									
19254CRM	RESEARCH METHODOLOGY	CO 1	After completion of the syllabus students will able to get knowledge about the different research techniques and research report.	✓									
19254CBR	PARTICIPATION IN BOUNDED RESEARCH	CO 1	After completion of the syllabus students will able to get knowledge about the project report.		✓								
19254L26	AUTOMATION LAB	CO 1	To perform documentation			✓							
		CO 2	To perform accounting operations				✓						
		CO 3	To perform presentation skills					✓					
192TECWR	TECHNICAL WRITING/SEMINAR	CO 1	Make effective presentations			✓							
		CO 2	Participate confidently in Group Discussions.			✓							

		CO 3	Attend job interviews and be successful in them.	✓									
		CO 4	Develop adequate Soft Skills required for the workplace		✓								
19254C31	METAL FORMING PROCESS	CO 1	Determine major process/processes of manufacturing used for given application.			✓							
		CO 2	Explain when and why metal forming is chosen compared to other compatible methods				✓						
		CO 3	Analyze effect of parameters influencing metal forming and compare hot working and cold working with applications	✓									
		CO 4	Explain capabilities and applications of bulk metal forming processes and sheet metal work.	✓									
		CO 5	Outline tooling and equipments required for important metal forming processes.	✓									
19254E32B	INSTRUMENTATION AND CONTROL ENGINEERING	CO 1	Ability to understand and analyse process control engineering problems.				✓						
19254E33B	FLUID POWER AUTOMATION	CO 1	At the end of this course the students are familiarized in the area of hydraulics, pneumatic and fluid power components and its functions.					✓					

19254E34A	ADVANCED MATERIAL TECHNOLOGY	CO 1	To impart knowledge on material selection methods and basics of advanced engineering materials.							✓			
		CO 2	To introduce the basics of smart materials, composite materials, ceramics and glasses and modern									✓	
19254CSR	DESIGN PROJECT /SOCIO TECHNICAL PROJECT (SCAFFOLDED RESEARCH)	CO 1	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.										✓
19254P35	PROJECT WORK PHASE I	CO 1	On Completion of the project work students will be in a position to take up any challenging practical problems	✓									
19254P41	PROJECT WORK PHASE II	CO 1	On Completion of the project work students will be in a position to take up any challenging practical problems	✓									

DEPARTMENT OF MECHANICAL ENGINEERING

M.TECH - PART TIME (PG - 2019)

COURSE CODE	COURSE TITLE	CO	COURSE OUTCOMES	PO1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9
19248S11EP	ADVANCED ENGINEERING MATHEMATICS	CO 1	Understand Finite differences, interpolation techniques, Numerical differentiation and Integration and apply it to various practical problems	✓								

		CO 2	Apply Numerical methods to solve first order ordinary differential equations and Algebraic and Transcendental equations	✓									
		CO 3	Illustrate Laplace transform and its application in different fields			✓							
		CO 4	Apply Fourier transforms and its applications to solve Ordinary and Partial differential equations				✓						
		CO 5	Use Z-transform and its applications to solve difference equations					✓					
19254C12P	THEORY OF METAL CUTTING	CO 1	Apply cutting mechanics to metal machining based on cutting force and power consumption.	✓									
		CO 2	Operate lathe, milling machines, drill press, grinding machines, etc.		✓								
		CO 3	Select cutting tool materials and tool geometries for different metals.	✓				✓					
		CO 4	Select appropriate machining processes and conditions for different metals.						✓				
		CO 5	Learn machine tool structures and machining economics.						✓				
19254C13P	ADVANCED MANUFACTURING PROCESSES	CO 1	Able to understand different types of composite material characteristics, types of micro & macro machining processes.	✓									

		CO 2	Understand the e-manufacturing & nano materials.		✓								
19254L14P	CIM LAB	CO 1	To impart the knowledge on training the students in the area of CAD/CAM				✓						
19254CRSP	RESEARCH LED SEMINAR	CO 1	Understand research problem formulation.				✓						
		CO 2	Analyze research related information		✓								
		CO 3	Follow research ethics		✓								
		CO 4	Understanding that when IPR would take such important place in growth of individuals & nation, it is needless to emphasis the need of information about Intellectual Property Right to be promoted among students in general & engineering in particular								✓		
		CO 5	Understand that today's world is controlled by Computer, Information Technology, but tomorrow world will be ruled by ideas, concept, and creativity							✓			
19254C21P	PRODUCTION MANAGEMENT	CO 1	Understand the role of operations management in achieving organizational competitiveness		✓								
		CO 2	Appreciate the concepts of lean production and maintenance management in operations	✓									

		CO 3	Comprehend key decision areas of operations and analyze data for effective decision making in operations management.		✓								
19254C22P	MEMS AND NANO TECHNOLOGY	CO 1	Ability to understand the operation of micro devices, micro systems and their applications	✓									
		CO 2	Ability to design the micro devices, micro systems using the MEMS fabrication process.	✓									
		CO 3	Gain a knowledge of basic approaches for various sensor design		✓								
		CO 4	Gain a knowledge of basic approaches for various actuator design			✓							
19254E23BP	LEAN MANUFACTURING	CO 1	The student will be able to practice the principles of lean manufacturing like customer focus, reduction of MUDA, just in time, Jidoka and Hoshin planning.	✓									
19254L24P	AUTOMATION LAB	CO 1	To perform documentation			✓							
		CO 2	To perform accounting operations				✓						
		CO 3	To perform presentation skills					✓					
192TECWR P	TECHNICAL WRITING/SEMINAR	CO 1	Make effective presentations			✓							
		CO 2	Participate confidently in Group Discussions.			✓							

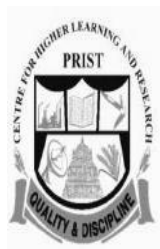
		CO 3	Attend job interviews and be successful in them.	✓										
		CO 4	Develop adequate Soft Skills required for the workplace		✓									
19254CRMP	RESEARCH METHODOLOGY	CO 1	After completion of the syllabus students will able to get knowledge about the different research techniques and research report.	✓										
19254CBRP	PARTICIPATION IN BOUNDED RESEARCH	CO 1	After completion of the syllabus students will able to get knowledge about the project report.		✓									
19254C31P	MECHANICAL METALLURGY	CO 1	Identify the properties of metals with respect to crystal structure and grain size			✓								
		CO 2	Interpret the phase diagrams of materials					✓						
		CO 3	Classify and Distinguish different types of cast irons, steels and non ferrous alloys	✓										
		CO 4	Describe the concept of heat treatment of steels & strengthening mechanisms	✓										
		CO 5	Explain the powder metallurgy process, types and manufacturing of composite materials											✓
19254C32P	AUTOMATED COMPUTER INTEGRATED	CO 1	to produce useful research output in computer integrated manufacturing					✓						

	MANUFACTURING SYSTEMS	CO 2	use this knowledge to develop computer techniques				✓					
		CO 3	Application of this knowledge to functionalise computer aided planning.			✓						
19254E33AP	MATERIALS MANAGEMENT AND LOGISTICS	CO 1	Understanding basics of materials management					✓				
		CO 2	Understanding requirement analysis for material planning	✓								
		CO 3	Ability to apply inventory management models	✓								
		CO 4	Understanding purchasing practices				✓					
		CO 5	Understanding storage in warehouse				✓					
19254CSR	DESIGN PROJECT /SOCIO TECHNICAL PROJECT (SCAFFOLDED RESEARCH)	CO 1	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.									✓
19254C41P	MANUFACTURING METROLOGY AND QUALITY CONTROL	CO 1	They can choose appropriate method and instruments for inspection of various gear elements and thread elements. They can understand the standards of length, angles, they can understand the evaluation of surface finish and measure the parts with various comparators. The quality of the machine tool				✓					

			with alignment test can also be evaluated by them.										
19254E43BP	MAINTENANCE MANAGEMENT	CO 1	Explain maintenance objectives and functions, factors influencing Plant Availability, Need for maintenance plan and organization, Functions of maintenance control and determine Failure probability, Survival probability and Age specific failure rates of equipments and components.		✓								
		CO 2	Determine the optimal overhaul/repair/replacement maintenance policy for an equipment subject to breakdown and optimal interval between preventive replacements for individual and group replacement of equipments.			✓							

		CO 3	Explain different maintenance systems and the steps involved in establishing a maintenance plan and designing a technically sound preventive maintenance and lubrication program. (Comprehend)				✓						
		CO 4	Determine the optimal inspection frequency for maximization of profit and minimization of down time and the critical path using CPM and PERT	✓									
		CO 5	Explain the NUCREC method of prioritizing maintenance work, classification of spares and the costs associated with spares inventory, perform EOQ computations, explain MUSIC - 3D approach to spares management, determine the optimal number of spares to satisfy given service level and apply simulation technique for spares inventory.	✓									
19254C42P	METAL FORMING PROCESS	CO 1	Determine major process/processes of manufacturing used for given application.			✓							
		CO 2	Explain when and why metal forming is chosen compared to other compatible methods				✓						

		CO 3	Analyze effect of parameters influencing metal forming and compare hot working and cold working with applications	✓									
		CO 4	Explain capabilities and applications of bulk metal forming processes and sheet metal work.	✓									
		CO 5	Outline tooling and equipments required for important metal forming processes.	✓									
19254P44P	PROJECT WORK PHASE I	CO 1	On Completion of the project work students will be in a position to take up any challenging practical problems	✓									
19254E51BP	INSTRUMENTATION AND CONTROL ENGINEERING	CO 1	Ability to understand and analyse process control engineering problems.				✓						
19254E52BP	FLUID POWER AUTOMATION	CO 1	At the end of this course the students are familiarized in the area of hydraulics, pneumatic and fluid power components and its functions.					✓					
19254E53AP	ADVANCED MATERIAL TECHNOLOGY	CO 1	To impart knowledge on material selection methods and basics of advanced engineering materials.						✓				
		CO 2	To introduce the basics of smart materials, composite materials, ceramics and glasses and modern								✓		
19254P61P	PROJECT WORK PHASE II	CO 1	On Completion of the project work students will be in a position to take up any challenging practical problems	✓									



PRIST

DEEMED TO BE

UNIVERSITY

NAAC ACCREDITED THANJAVUR – 613 403 - TAMIL NADU

SCHOOL OF ENGINEERING AND TECHNOLOGY

**DEPARTMENT OF COMPUTER SCIENCE
AND
ENGINEERING**

2019R

Local Needs

Regional Needs

National Needs

Global Needs

SCHOOL OF ENGINEERING AND TECHNOLOGY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

1.1.1 PROGRAMME OUTCOMES

B.TECH

Engineering Graduates will be able to:

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

PO 2: Problem analysis: Identify, formulate, and solve complex engineering problems with high degree of competence.

PO3: 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.

PO4: Design/development of solutions: Design solutions for mechanical engineering problems and design components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO5: Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering use modern tools, software and equipment to analyze multidisciplinary.

PO6: 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.

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.

PO 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

PO 11: effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO 12: 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.

PO 13: 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.

Local Needs

Regional Needs

National Needs

Global Needs

SCHOOL OF ENGINEERING AND TECHNOLOGY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

PROGRAMME OUTCOMES
M.TECH

M.TECH- COMPUTER SCIENCE AND ENGINEERING (Full Time - 2 Yrs; Part Time – 3Yrs)

- 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 responsibilities relevant 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.

Local Needs

Regional Needs

National Needs

Global Needs

SCHOOL OF ENGINEERING AND TECHNOLOGY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

PROGRAMME SPECIFIC OUTCOMES

B.TECH

- PSO1:** To analyze, design and develop solutions by applying foundational concepts of electronics and communication engineering.
- PSO2:** To apply design principles and best practices for developing quality products for scientific and business applications.
- PSO3:** To adapt to emerging information and communication technologies (ICT) to innovate ideas and solutions to existing/novel problems.

M.TECH

- PSO1:** To analyze, design and develop solutions by applying foundational concepts of electronics and communication engineering.
- PSO2:** To apply design principles and best practices for developing quality products for scientific and business applications.
- PSO3:** To adapt to emerging information and communication technologies (ICT) to innovate ideas and solutions to existing/novel problems.

Local Needs

Regional Needs

National Needs

Global Needs

19148S11P	Transforms And Partial Differential Equations	<ul style="list-style-type: none"> • Use both the limit definition and rules of differentiation to differentiate functions. • Apply differentiation to solve maxima and minima problems. • Evaluate integrals both by using Riemann sums and by using the Fundamental Theorem of Calculus. • Apply integration to compute multiple integrals, area, volume, integrals in polar coordinates, in addition to change of order and change of variables. • Evaluate integrals using techniques of integration, such as substitution, partial fractions and integration by parts. • Determine convergence/divergence of improper integrals and evaluate convergent improper integrals. • Apply various techniques in solving differential equations.
19150C12P	Digital Systems	<ul style="list-style-type: none"> • using basic logic gates • Implement combinational circuits using MSI devices • Implement sequential circuits like registers and counters • Simulate combinational and sequential circuits using HDL
19150C13P	Data Structures And Algorithms	<ul style="list-style-type: none"> • Analyze algorithms. • Determine algorithm correctness. • Choose appropriate data structures for the problems to be solved. • Design algorithms for problems from different domains. • Identify various research strategies on
19150C25P	Software Engineering	<ul style="list-style-type: none"> • Integrate various soft computing techniques for complex problems
19148S31P	Discrete Mathematics	<ul style="list-style-type: none"> • Have knowledge of the concepts needed to test the logic of a program. • Have an understanding in identifying structures on many levels. • Be aware of a class of functions which transform a finite set into another finite set which relates to input and output functions in computer science. • Be aware of the counting principles • Be exposed to concepts and properties of algebraic structures such as groups, rings and fields
19150C32P	Operating System	<ul style="list-style-type: none"> • Design algorithms for various computing problems. • Analyze the time and space complexity of algorithms. • Critically analyze the different algorithm design techniques for a given problem. • Modify existing algorithms to improve efficiency.

Local Needs

Regional Needs

National Needs

Global Needs

19150C33P	Artificial Intelligence	<ul style="list-style-type: none"> • Use appropriate search algorithms for any AI problem • Represent a problem using first order and predicate logic • Provide the apt agent strategy to solve a given problem • Design software agents to solve a problem <p>Design applications for NLP that use Artificial Intelligence.</p>
19150L35P	Operating Systems And Networking Lab	<p>Compare the performance of various CPUScheduling Algorithms</p> <ul style="list-style-type: none"> • Implement Deadlock avoidance and Detection

19150C41P	Principles Of Cryptography	<p>Analyze various scheduling algorithms.</p> <ul style="list-style-type: none"> • Understand deadlock, prevention and avoidance algorithms. • Compare and contrast various memory management schemes. • Understand the functionality of file systems. • Perform administrative tasks on Linux Servers. • Compare iOS and Android Operating Systems.
19150C42P	Web Technology	<p>problems.</p> <ul style="list-style-type: none"> • Analyze the time and space complexity of algorithms. • Critically analyze the different algorithm design techniques for a given problem. <p>• Modify existing</p>
19150C43P	C# And .Net Framework	<p>Write various applications using C# Language in the .NET Framework.</p> <ul style="list-style-type: none"> • Develop distributed applications using .NET Framework. • Create mobile applications using .NET compact Framework

Local Needs

Regional Needs

National Needs

Global Needs

19150E44DP	Advanced Databases	<ul style="list-style-type: none"> • Design and implement relational databases. • Design and implement parallel and distributed databases. • Design and implement XML databases, Active, Temporal and Deductive databases. • Implement the concept of database connectivity with the applications. • Design and implement NoSQL database
19150L45P	Internet Programming Lab	<ul style="list-style-type: none"> • Construct a basic website using HTML and Cascading Style Sheets. • Build dynamic web page with validation using Java Script objects and by applying different event handling mechanisms. • Develop server side programs using Servlets and JSP. • Construct simple web pages in PHP and to represent data in XML format. <p>Use AJAX and web services to develop interactive web applications</p>
19150C51P	Object Oriented Analysis And Design	<ul style="list-style-type: none"> • Develop Java programs using OOP principles • Develop Java programs with the concepts inheritance and interfaces • Build Java applications using exceptions and I/O streams • Develop Java applications with threads and

19150C52P	Software Quality Management	<ul style="list-style-type: none"> Identify the key activities in managing a software project. • Compare different process models. • Concepts of requirements engineering and Analysis Modeling. • Apply systematic procedure for software design and deployment. • Compare and contrast the various testing and maintenance. • Manage project schedule, estimate project cost and effort required
19150C53P	Graphics And Multimedia	<ul style="list-style-type: none"> Understand the basic concepts of graphs, and different types of graphs • Understand the properties, theorems and be able to prove theorems. • Apply suitable graph model and algorithm for solving applications
19150E54AP	Soft Computing	<ul style="list-style-type: none"> • Apply suitable soft computing techniques for various applications. • Integrate various soft computing techniques for complex problems
		<ul style="list-style-type: none"> generics classes • Develop interactive Java programs using swing

Local Needs

Regional Needs

National Needs

Global Needs

19150E54BP	Principles Of Compiler Design	<ul style="list-style-type: none"> Classify the modern and futuristic database applications based on size and complexity Map ER model to Relational model to perform database design effectively Write queries using normalization criteria and optimize queries Compare and contrast various indexing strategies in different database systems Appraise how advanced databases differ from traditional databases
19150E54CP	Distributed Systems	<ul style="list-style-type: none"> problem Represent a problem using first order and predicate logic Provide the apt agent strategy to solve a given problem Design software agents to solve a problem
19150E54DP	Mobile Computing	<ul style="list-style-type: none"> Explain the basics of mobile telecommunication systems Illustrate the generations of telecommunication systems in wireless networks Determine the functionality of MAC, network layer and Identify a routing protocol for a given Ad hoc network Explain the functionality of Transport and Application layers Develop a mobile application using

19150L55P	Software Development Lab	<ul style="list-style-type: none"> Apply suitable soft computing techniques for various applications. Integrate various soft computing techniques for complex problems
19150C61P	Embedded Systems	<ul style="list-style-type: none"> processor. Explain the concepts of embedded systems Understand the Concepts of peripherals and interfacing of sensors. Capable of using the system design techniques to develop firmware Illustrate the code for constructing a system
19150C62P	Advanced Java Programming	<ul style="list-style-type: none"> Construct Web pages using HTML/XML and style sheets. Build dynamic web pages with validation using Java Script objects and by applying different event handling mechanisms. Develop dynamic web pages using server side scripting.
		android/blackberry/ios/Windows SDK
19150L55P	Software Development Lab	<ul style="list-style-type: none"> Apply suitable soft computing techniques for various applications. Integrate various soft computing techniques for complex problems

Local Needs

Regional Needs

National Needs

Global Needs

19150C63P	Software Testing	<p>Identify the key activities in managing a software project.</p> <ul style="list-style-type: none"> • Compare different process models. • Concepts of requirements engineering and Analysis Modeling. • Apply systematic procedure for software design and deployment. • Compare and contrast the various testing and maintenance. • Manage project schedule, estimate project cost and effort required
19150E64AP	Principles Of Management	<p>Analyze various scheduling algorithms.</p> <ul style="list-style-type: none"> • Understand deadlock, prevention and avoidance algorithms. • Compare and contrast various memory management schemes. • Understand the functionality of file systems. • Perform administrative tasks on Linux Servers. • Compare iOS and Android Operating Systems.
19150E64BP	Unix Internals	<ul style="list-style-type: none"> • problem • Represent a problem using first order and predicate logic • Provide the apt agent strategy to solve a given problem • Design software agents to solve a problem
19150E64CP	Parallel Computing	<p>processor.</p> <ul style="list-style-type: none"> • Explain the concepts of embedded systems • Understand the Concepts of peripherals and interfacing of sensors.

Local Needs

Regional Needs

National Needs

Global Needs

		<ul style="list-style-type: none"> • Capable of using the system design techniques to develop firmware • Illustrate the code for constructing a system
19150E64DP	Programming Paradigms	<ul style="list-style-type: none"> • problem • Represent a problem using first order and predicate logic • Provide the apt agent strategy to solve a given problem • Design software agents to solve a problem
19150L65P	Java Programming Lab	<p>Construct Web pages using HTML/XML and style sheets.</p> <ul style="list-style-type: none"> • Build dynamic web pages with validation using Java Script objects and by applying different event handling mechanisms. • Develop dynamic web pages using server side scripting. • Use PHP programming to develop web applications. • Construct web applications using AJAX and web services.
19150E74BP	Bio Informatics	<p>Analyze various scheduling algorithms.</p> <ul style="list-style-type: none"> • Understand deadlock, prevention and avoidance algorithms. • Compare and contrast various memory management schemes. • Understand the functionality of file systems. • Perform administrative tasks on Linux Servers. • Compare iOS and A
19150E74CP	Software Project Management	<p>project.</p> <ul style="list-style-type: none"> • Compare different process models. • Concepts of requirements engineering and Analysis Modeling. • Apply systematic procedure for software design and deployment. • Compare and contrast the various testing and maintenance. • Manage project schedule, estimate project cost and effort required
19150E74DP	Digital Image Processing	<p>digital image processing, such as digitization, sampling, quantization, and 2D-transforms.</p> <ul style="list-style-type: none"> • Operate on images using the techniques of smoothing, sharpening and enhancement. • Understand the restoration concepts and filtering techniques. • Learn the basics of segmentation, features extraction, compression and recognition methods for color models
19150P75P	Project	<p>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</p>
19248S11A	Higher Mathematics	<p>Eigen values and eigenvectors, diagonalization of a</p>

Local Needs

Regional Needs

National Needs

Global Needs

		<p>matrix, Symmetric matrices, Positive definite matrices and similar matrices.</p> <ul style="list-style-type: none"> • Gradient, divergence and curl of a vector point function and related identities. • Evaluation of line, surface and volume integrals using Gauss, Stokes and Green's theorems and their verification. • Analytic functions, conformal mapping and complex integration. <p>• Laplace transform and inverse transform of simple functions, properties, various related theorems and application to differential equations with constant coefficients</p>
19250C12	Modern Operating System	<p>Analyze various scheduling algorithms.</p> <ul style="list-style-type: none"> • Understand deadlock, prevention and avoidance algorithms. • Compare and contrast various memory management schemes. • Understand the functionality of file systems. • Perform administrative tasks on Linux Servers. • Compare iOS and Android Operating Systems.
19250C13	Parallel And High Performance Computing	<p>different types of graphs</p> <ul style="list-style-type: none"> • Understand the properties, theorems and be able to prove theorems. • Apply suitable graph
19250C14	Adhoc And Sensor Network	<p>Identify different issues in wireless ad hoc and sensor networks .</p> <ul style="list-style-type: none"> • To analyze protocols developed for ad hoc and sensor networks . • To identify and understand security issues in ad hoc and sensor networks
19250C15	Advanced Data Structures And Algorithms	<ul style="list-style-type: none"> • Develop Java programs using OOP principles • Develop Java programs with the concepts inheritance and interfaces • Build Java applications using exceptions and I/O streams • Develop Java applications with threads and generics classes • Develop interactive
19250E16A	Multimedia Systems	<p>Understand the basic concepts of graphs, and different types of graphs</p> <ul style="list-style-type: none"> • Understand the properties, theorems and be able to prove theorems. • Apply suitable graph model and algorithm for solving applications
19250E16B	Genetic Algorithms	<p>Write various applications using C# Language in the .NET Framework.</p> <ul style="list-style-type: none"> • Develop distributed applications using .NET Framework. • Create mobile applications using .NET compact

Local Needs

Regional Needs

National Needs

Global Needs

		Framework
19250E16C	Software Metrics	<p>Identify different issues in wireless ad hoc and sensor networks .</p> <ul style="list-style-type: none"> • To analyze protocols developed for ad hoc and sensor networks . • To identify and understand security issues in ad hoc and sensor networks.
19250L17	Advanced Web Technologies Lab	<p>To develop in-depth understanding of relational databases and skills to optimize database performance in practice.</p> <ul style="list-style-type: none"> • To understand and critique on each type of databases. • To design faster algorithms in solving practical database problems. • To implement intelligent databases and various data models.
19250C21	Middleware Technologies	<p>Understand the basic concepts of graphs, and different types of graphs</p> <ul style="list-style-type: none"> • Understand the properties, theorems and be able to prove theorems. • Apply suitable graph model and algorithm for solving applications
19250C22	Object Oriented Software Engineering	<ul style="list-style-type: none"> • Develop Java programs using OOP principles • Develop Java programs with the concepts inheritance and interfaces • Build Java applications using exceptions and I/O streams • Develop Java applications with threads and generics classes • Develop interactive
19250C23	Digital Image Processing	<p>Understand the basic concepts of graphs, and different types of graphs</p> <ul style="list-style-type: none"> • Understand the properties, theorems and be able to prove theorems. • Apply suitable graph model and algorithm for solving applications
19250E24A	Advanced Distributed Computing	<p>To develop in-depth understanding of relational databases and skills to optimize database performance in practice.</p> <ul style="list-style-type: none"> • To understand and critique on each type of databases. • To design faster algorithms in solving practical database problems. • To implement intelligent databases and various data models.
19250E24B	Data Warehousing & Data Mining	<ul style="list-style-type: none"> • Design a Data warehouse system and perform business analysis with OLAP tools. • Apply suitable pre-processing and visualization techniques for data analysis • Apply frequent pattern and association rule mining techniques for data analysis • Apply appropriate classification and clustering

Local Needs

Regional Needs

National Needs

Global Needs

		techniques for data analysis
19250E24C	Artificial Neural Networks	To develop in-depth understanding of relational databases and skills to optimize database performance in practice. <ul style="list-style-type: none"> To understand and critique on each type of databases. To design faster algorithms in solving practical database problems. To implement intelligent databases and various data models.
19250E25A	Service Oriented Architecture	Understand XML technologies <ul style="list-style-type: none"> Understand service orientation, benefits of SOA Understand web services and WS standards Use web services extensions to develop solutions Understand and apply service modeling, service oriented analysis and design for application development
19250E25B	High Speed Networks	Understand the basic concepts of graphs, and different types of graphs <ul style="list-style-type: none"> Understand the properties, theorems and be able to prove theorems. Apply suitable graph model and algorithm for solving applications
19250E25C	Embedded Systems	Describe the architecture and programming of ARM processor. <ul style="list-style-type: none"> Explain the concepts of embedded systems Understand the Concepts of peripherals and interfacing of sensors. Capable of using the system design techniques to develop firmware Illustrate the code for constructing a system
19250L26	.Net Technologies Lab	Write various applications using C# Language in the .NET Framework. <ul style="list-style-type: none"> Develop distributed applications using .NET Framework. Create mobile applications using .NET compact Framework
192TECWR	Technical Writing /Seminars	Identify different issues in wireless ad hoc and sensor networks . <ul style="list-style-type: none"> To analyze protocols developed for ad hoc and sensor networks . To identify and understand security issues in ad hoc and sensor networks.
19250CRM	Research Methodology	To develop in-depth understanding of relational databases and skills to optimize database performance in practice. <ul style="list-style-type: none"> To understand and critique on each type of databases. To design faster algorithms in solving practical database problems. To implement intelligent databases and various data models.
19250CBR	Participation In Bounded Research	Identify the key activities in managing a software

Local Needs

Regional Needs

National Needs

Global Needs

		<p>project.</p> <ul style="list-style-type: none"> • Compare different process models. • Concepts of requirements engineering and Analysis Modeling. • Apply systematic procedure for software design and deployment. • Compare and contrast the various testing and maintenance. <p>Manage project schedule, estimate project cost and effort required</p>
19250C31	Software Project Management	<p>Identify the key activities in managing a software project.</p> <ul style="list-style-type: none"> • Compare different process models. • Concepts of requirements engineering and Analysis Modeling. • Apply systematic procedure for software design and deployment. • Compare and contrast the various testing and maintenance. <p>• Manage project schedule, estimate project cost and effort required</p>
19250E32A	Cloud Computing	<p>Articulate the main concepts, key technologies, strengths and limitations of cloud computing. • Identify the architecture, infrastructure and delivery models of cloud computing. • Explain the core issues of cloud computing such as security, privacy and interoperability. • Choose the appropriate technologies, algorithms and approaches for the related issues. • Facilitate Service Level Agreements (SLA).</p>
19250E32B	Information Security	<p>Identify the key activities in managing a software project.</p> <ul style="list-style-type: none"> • Compare different process models. • Concepts of requirements engineering and Analysis Modeling. • Apply systematic procedure for software design and deployment. • Compare and contrast the various testing and maintenance. <p>• Manage project schedule, estimate project cost and effort required</p>
19250E32C	Soft Computing	<p>Identify the key activities in managing a software project.</p> <ul style="list-style-type: none"> • Compare different process models. • Concepts of requirements engineering and Analysis Modeling. • Apply systematic procedure for software design and deployment. • Compare and contrast the various testing and maintenance. <p>• Manage project schedule, estimate project cost and effort required</p>

Local Needs

Regional Needs

National Needs

Global Needs

19250E33A	Advanced Database Technology	<p>Identify the key activities in managing a software project.</p> <ul style="list-style-type: none"> • Compare different process models. • Concepts of requirements engineering and Analysis Modeling. • Apply systematic procedure for software design and deployment. • Compare and contrast the various testing and maintenance. • Manage project schedule, estimate project cost and effort required
19250E33B	Mobile Communication And Computing	<ul style="list-style-type: none"> • Develop mobile applications using GUI and Layouts. • Develop mobile applications using Event Listener. • Develop mobile applications using Databases. • Develop mobile applications using RSS Feed, Internal/External Storage, SMS, Multithreading and GPS. • Analyze and discover own mobile app for simple needs.
19250E33C	Green Computing	
19250E34A	Software Quality Assurance	<p>Identify the key activities in managing a software project.</p> <ul style="list-style-type: none"> • Compare different process models. • Concepts of requirements engineering and Analysis Modeling. • Apply systematic procedure for software design and deployment. • Compare and contrast the various testing and maintenance. • Manage project schedule, estimate project cost and effort required
19250E34B	Bio-Informatics	<p>Identify the key activities in managing a software project.</p> <ul style="list-style-type: none"> • Compare different process models. • Concepts of requirements engineering and Analysis Modeling. • Apply systematic procedure for software design and deployment. • Compare and contrast the various testing and maintenance. • Manage project schedule, estimate project cost and effort required
19250E34C	Wireless Application Protocols	<p>Identify different issues in wireless ad hoc and sensor networks .</p> <ul style="list-style-type: none"> • To analyze protocols developed for ad hoc and sensor networks . • To identify and understand security issues in ad hoc and sensor networks
19250P35	Project Work Phase - I	On Completion of the project work students will be in a position to take up any challenging practical problems

Local Needs

Regional Needs

National Needs

Global Needs

		and find solution by formulating proper methodology
19250P41	Project Work Phase - Ii	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
19248S11A	Higher Mathematics	Identify different issues in wireless ad hoc and sensor networks . <ul style="list-style-type: none"> • To analyze protocols developed for ad hoc and sensor networks . • To identify and understand security issues in ad hoc and sensor networks.
19250C12	Modern Operating System	To develop in-depth understanding of relational databases and skills to optimize database performance in practice. <ul style="list-style-type: none"> • To understand and critique on each type of databases. • To design faster algorithms in solving practical database problems. • To implement intelligent databases and various data models.
19250C13	Parallel And High Performance Computing	Understand the basic concepts of graphs, and different types of graphs <ul style="list-style-type: none"> • Understand the properties, theorems and be able to prove theorems. • Apply suitable graph model and algorithm for solving applications
19250C14	Adhoc And Sensor Network	<ul style="list-style-type: none"> • Develop Java programs using OOP principles • Develop Java programs with the concepts inheritance and interfaces • Build Java applications using exceptions and I/O streams • Develop Java applications with threads and generics classes • Develop interactive
19250C15	Advanced Data Structures And Algorithms	Understand the basic concepts of graphs, and different types of graphs <ul style="list-style-type: none"> • Understand the properties, theorems and be able to prove theorems. • Apply suitable graph model and algorithm for solving applications
19250E16A	Multimedia Systems	To develop in-depth understanding of relational databases and skills to optimize database performance in practice. <ul style="list-style-type: none"> • To understand and critique on each type of databases. • To design faster algorithms in solving practical database problems. • To implement intelligent databases and various data models.
19250E16B	Genetic Algorithms	<ul style="list-style-type: none"> • Design a Data warehouse system and perform business analysis with OLAP tools. • Apply suitable pre-processing and visualization techniques for data analysis

Local Needs

Regional Needs

National Needs

Global Needs

		<ul style="list-style-type: none"> Apply frequent pattern and association rule mining techniques for data analysis Apply appropriate classification and clustering techniques for data analysis
19250E16C	Software Metrics	<p>To develop in-depth understanding of relational databases and skills to optimize database performance in practice.</p> <ul style="list-style-type: none"> To understand and critique on each type of databases. To design faster algorithms in solving practical database problems. To implement intelligent databases and various data models.
19250L17	Advanced Web Technologies Lab	<p>Understand XML technologies</p> <ul style="list-style-type: none"> Understand service orientation, benefits of SOA Understand web services and WS standards Use web services extensions to develop solutions Understand and apply service modeling, service oriented analysis and design for application development
19250CRS	Research Led Seminar	<p>Understand the basic concepts of graphs, and different types of graphs</p> <ul style="list-style-type: none"> Understand the properties, theorems and be able to prove theorems. Apply suitable graph model and algorithm for solving applications
19250C21	Middleware Technologies	<p>Describe the architecture and programming of ARM processor.</p> <ul style="list-style-type: none"> Explain the concepts of embedded systems Understand the Concepts of peripherals and interfacing of sensors. Capable of using the system design techniques to develop firmware Illustrate the code for constructing a system
19250C22	Object Oriented Software Engineering	<p>Write various applications using C# Language in the .NET Framework.</p> <ul style="list-style-type: none"> Develop distributed applications using .NET Framework. Create mobile applications using .NET compact Framework
19250C23	Digital Image Processing	<p>Identify different issues in wireless ad hoc and sensor networks .</p> <ul style="list-style-type: none"> To analyze protocols developed for ad hoc and sensor networks . To identify and understand security issues in ad hoc and sensor networks.
19250E24A	Advanced Distributed Computing	<p>To develop in-depth understanding of relational databases and skills to optimize database performance in practice.</p> <ul style="list-style-type: none"> To understand and critique on each type of databases. To design faster algorithms in solving practical

Local Needs

Regional Needs

National Needs

Global Needs

		<p>database problems.</p> <ul style="list-style-type: none"> • To implement intelligent databases and various data models.
19250E24B	Data Warehousing & Data Mining	<p>Identify the key activities in managing a software project.</p> <ul style="list-style-type: none"> • Compare different process models. • Concepts of requirements engineering and Analysis Modeling. • Apply systematic procedure for software design and deployment. • Compare and contrast the various testing and maintenance. • Manage project schedule, estimate project cost and effort required
19250E24C	Artificial Neural Networks	<p>Identify the key activities in managing a software project.</p> <ul style="list-style-type: none"> • Compare different process models. • Concepts of requirements engineering and Analysis Modeling. • Apply systematic procedure for software design and deployment. • Compare and contrast the various testing and maintenance. • Manage project schedule, estimate project cost and effort required
19250E25A	Service Oriented Architecture	<p>Articulate the main concepts, key technologies, strengths and limitations of cloud computing. • Identify the architecture, infrastructure and delivery models of cloud computing. • Explain the core issues of cloud computing such as security, privacy and interoperability. • Choose the appropriate technologies, algorithms and approaches for the related issues. • Facilitate Service Level Agreements (SLA).</p>
19250E25B	High Speed Networks	<p>Identify the key activities in managing a software project.</p> <ul style="list-style-type: none"> • Compare different process models. • Concepts of requirements engineering and Analysis Modeling. • Apply systematic procedure for software design and deployment. • Compare and contrast the various testing and maintenance. • Manage project schedule, estimate project cost and effort required
19250E25C	Embedded Systems	<p>Identify the key activities in managing a software project.</p> <ul style="list-style-type: none"> • Compare different process models. • Concepts of requirements engineering and Analysis Modeling. • Apply systematic procedure for software design and deployment.

Local Needs

Regional Needs

National Needs

Global Needs

		<ul style="list-style-type: none"> • Compare and contrast the various testing and maintenance. • Manage project schedule, estimate project cost and effort required
19250L26	.Net Technologies Lab	<p>Identify the key activities in managing a software project.</p> <ul style="list-style-type: none"> • Compare different process models. • Concepts of requirements engineering and Analysis Modeling. • Apply systematic procedure for software design and deployment. • Compare and contrast the various testing and maintenance. • Manage project schedule, estimate project cost and effort required
192TECWR	Technical Writing /Seminars	<p>Develop mobile applications using GUI and Layouts. •</p> <p>Develop mobile applications using Event Listener. •</p> <p>Develop mobile applications using Databases.</p> <ul style="list-style-type: none"> • Develop mobile applications using RSS Feed, Internal/External Storage, SMS, Multithreading and GPS. • Analyze and discover own mobile app for simple needs.
19250CRM	Research Methodology	<ul style="list-style-type: none"> • Compare different process models. • Concepts of requirements engineering and Analysis Modeling.
19250CBR	Participation In Bounded Research	<p>Identify the key activities in managing a software project.</p> <ul style="list-style-type: none"> • Compare different process models. • Concepts of requirements engineering and Analysis Modeling. • Apply systematic procedure for software design and deployment. • Compare and contrast the various testing and maintenance. • Manage project schedule, estimate project cost and effort required
19250C31	Software Project Management	<p>Identify the key activities in managing a software project.</p> <ul style="list-style-type: none"> • Compare different process models. • Concepts of requirements engineering and Analysis Modeling. • Apply systematic procedure for software design and deployment. • Compare and contrast the various testing and maintenance. • Manage project schedule, estimate project cost and effort required
19250E32A	Cloud Computing	Identify different issues in wireless ad hoc and sensor

Local Needs

Regional Needs

National Needs

Global Needs

		<p>networks .</p> <ul style="list-style-type: none"> • To analyze protocols developed for ad hoc and sensor networks . • To identify and understand security issues in ad hoc and sensor networks
19250E32B	Information Security	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
19250E32C	Soft Computing	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
19250E33A	Advanced Database Technology	<ul style="list-style-type: none"> • Compare different process models. • Concepts of requirements engineering and Analysis Modeling.
19250E33B	Mobile Communication And Computing	To identify and understand security issues in ad hoc and sensor networks
19250E33C	Green Computing	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
19250E34A	Software Quality Assurance	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
19250E34B	Bio-Informatics	<ul style="list-style-type: none"> • Compare and contrast the various testing and maintenance. • Manage project schedule, estimate project cost and effort required
19250E34C	Wireless Application Protocols	<p>Identify different issues in wireless ad hoc and sensor networks .</p> <ul style="list-style-type: none"> • To analyze protocols developed for ad hoc and sensor networks . • To identify and understand security issues in ad hoc and sensor networks
19250P35	Project Work Phase - I	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
19250P41	Project Work Phase - Ii	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
19147S11	Communicative English	<ul style="list-style-type: none"> • Read articles of a general kind in magazines and newspapers. • Participate effectively in informal conversations; introduce themselves and their friends and express opinions in English. • Comprehend conversations and short talks delivered in English • Write short essays of a general kind and personal letters and emails in English.

Local Needs

Regional Needs

National Needs

Global Needs

19148S12	Engineering Mathematics I	<ul style="list-style-type: none"> • Use both the limit definition and rules of differentiation to differentiate functions. • Apply differentiation to solve maxima and minima problems. • Evaluate integrals both by using Riemann sums and by using the Fundamental Theorem of Calculus. • Apply integration to compute multiple integrals, area, volume, integrals in polar coordinates, in addition to change of order and change of variables. • Evaluate integrals using techniques of integration, such as substitution, partial fractions and integration by parts. • Determine convergence/divergence of improper integrals and evaluate convergent improper integrals. • Apply various techniques in solving differential equations.
19149S13	Engineering Physics	<ul style="list-style-type: none"> • The students will gain knowledge on the basics of properties of matter and its applications • The students will acquire knowledge on the concepts of waves and optical devices and their applications in fibre optics, • The students will have adequate knowledge on the concepts of thermal properties of materials and their applications in expansion joints and heat exchangers, • The students will get knowledge on advanced physics concepts of quantum theory and its applications in tunneling microscopes, and • The students will understand the basics of crystals, their structures and different crystal growth techniques
19149S14	Engineering Chemistry	<ul style="list-style-type: none"> • The knowledge gained on engineering materials, fuels, energy sources and water treatment techniques will facilitate better understanding of engineering processes and applications for further learning
19154S15	Engineering Graphics	<p>Familiarize with the fundamentals and standards of Engineering graphics</p> <ul style="list-style-type: none"> • Perform freehand sketching of basic geometrical constructions and multiple views of objects • Project orthographic projections of lines and plane surfaces. • Draw projections and solids and development of surfaces. • Visualize and to project isometric and perspective sections of simple solids.
19150S16	Problem Solving And Basics Of Python Programming	<p>Develop algorithmic solutions to simple computational problems</p> <ul style="list-style-type: none"> • Read, write, execute by hand simple Python programs. • Structure simple Python programs for solving problems.

Local Needs

Regional Needs

National Needs

Global Needs

		<ul style="list-style-type: none"> Decompose a Python program into functions. Represent compound data using Python lists, tuples, dictionaries. Read and write data from/to files in Python Programs
19150L17	Problem Solving And Basics Of Python Programming laboratory	<ul style="list-style-type: none"> Write, test, and debug simple Python programs. Implement Python programs with conditionals and loops. Develop Python programs step-wise by defining functions and calling them. 28 Use Python lists, tuples, dictionaries for representing compound data. Read and write data from/to files in Python.
19149L18	Physics And Chemistry Laboratory	<p>Apply principles of elasticity, optics and thermal properties for engineering applications.</p> <ul style="list-style-type: none"> The students will be outfitted with hands-on knowledge in the quantitative chemical analysis of water quality related parameters.
191VEA19	Technical English	<p>Read technical texts and write area- specific texts effortlessly. • Listen and comprehend lectures and talks in their area of specialisation successfully. • Speak appropriately and effectively in varied formal and informal contexts. • Write reports and winning job applications.</p>
19147S21	Engineering Mathematics – II	<p>Eigen values and eigenvectors, diagonalization of a matrix, Symmetric matrices, Positive definite matrices and similar matrices.</p> <ul style="list-style-type: none"> Gradient, divergence and curl of a vector point function and related identities. Evaluation of line, surface and volume integrals using Gauss, Stokes and Green’s theorems and their verification. Analytic functions, conformal mapping and complex integration Laplace transform and inverse transform of simple functions, properties, various related theorems and application to differential equations with constant coefficients.
19148S22	Physics For Information Science	<p>Gain knowledge on classical and quantum electron theories, and energy band structures,</p> <ul style="list-style-type: none"> Acquire knowledge on basics of semiconductor physics and its applications in various devices, Get knowledge on magnetic properties of materials and their applications in data storage, Have the necessary understanding on the functioning of optical materials for optoelectronics, Understand the basics of quantum structures and their applications in carbon electronics..
19149S23A	Environmental Science And Engineering	<ul style="list-style-type: none"> Environmental Pollution or problems cannot be solved by mere laws. Public participation is an important aspect which serves the environmental

Local Needs

Regional Needs

National Needs

Global Needs

		<p>Protection. One will obtain knowledge on the following after completing the course.</p> <ul style="list-style-type: none"> • Public awareness of environmental is at infant stage. • Ignorance and incomplete knowledge has lead to misconceptions • Development and improvement in std. of living has lead to serious environmental disasters
19149S24A	Basic Electrical, Electronics And Measurement Engineering	<p>Discuss the essentials of electric circuits and analysis.</p> <ul style="list-style-type: none"> • Discuss the basic operation of electric machines and transformers • Introduction of renewable sources and common domestic loads. • Introduction to measurement and metering for electric circuits
19153S25A	Programming In C	<p>Develop simple applications in C using basic constructs</p> <ul style="list-style-type: none"> • Design and implement applications using arrays and strings • Develop and implement applications in C using functions and pointers. • Develop applications in C using structures. • Design applications using sequential and random access file processing.
19150S26A	Engineering Practices Laboratory	<ul style="list-style-type: none"> • Fabricate carpentry components and pipe connections including plumbing works. Use welding equipments to join the structures. Carry out the basic machining operations Make the models using sheet metal works Illustrate on centrifugal pump, Air conditioner, operations of smithy, foundary and fittings Carry out basic home electrical works and appliances Measure the electrical quantities Elaborate on the components, gates, soldering practices.
19154L27	C Programming Laboratory	<p>Develop C programs for simple applications making use of basic constructs, arrays and strings. • Develop C programs involving functions, recursion, pointers, and structures.</p> <ul style="list-style-type: none"> • Design applications using sequential and random access file processing.
19150L28A	Discrete Mathematics	<p>Have knowledge of the concepts needed to test the logic of a program.</p> <ul style="list-style-type: none"> • Have an understanding in identifying structures on many levels. • Be aware of a class of functions which transform a finite set into another finite set which relates to input and output functions in computer science. • Be aware of the counting principles • Be exposed to concepts and properties of algebraic

Local Needs

Regional Needs

National Needs

Global Needs

			structures such as groups, rings and fields
19150C33	Digital Principles And System Design		Simplify Boolean functions using KMap <ul style="list-style-type: none"> • Design and Analyze Combinational and Sequential Circuits • Implement designs using Programmable Logic Devices • Write HDL code for combinational and Sequential Circuits
19150C34	Data Structures		<ul style="list-style-type: none"> • 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.
19150S35	Object Oriented Programming		<ul style="list-style-type: none"> • Develop Java programs using OOP principles • Develop Java programs with the concepts inheritance and interfaces • Build Java applications using exceptions and I/O streams • Develop Java applications with threads and generics classes • Develop interactive Java programs using swing
19150S36	Communication Engineering		<ul style="list-style-type: none"> • Ability to comprehend and appreciate the significance and role of this course in the present contemporary world • Apply analog and digital communication techniques • Use data and pulse communication techniques. • Analyze Source and Error control coding
19150L36	Data Structures Laboratory		<ul style="list-style-type: none"> • Write functions to implement linear and non-linear data structure operations • Suggest appropriate linear / non-linear data structure operations for solving a given problem • Appropriately use the linear / non-linear data structure operations for a given problem • Apply appropriate hash functions that result in a collision free scenario for data storage and retrieval
19150L37	Object Oriented Programming Laboratory		<ul style="list-style-type: none"> • Develop and implement Java programs for simple applications that make use of classes, packages and interfaces. • Develop and implement Java programs with arraylist, exception handling and multithreading • Design applications using file processing, generic programming and event handling
19150L38	Digital Systems Laboratory		<ul style="list-style-type: none"> • Implement simplified combinational circuits using basic logic gates • Implement combinational circuits using MSI devices • Implement sequential circuits like registers and counters • Simulate combinational and sequential circuits using HDL

Local Needs

Regional Needs

National Needs

Global Needs

19150L39	Interpersonal Skills/Listening & Speaking	<ul style="list-style-type: none"> • Listen and respond appropriately. • Participate in group discussions • Make effective presentations • Participate confidently and appropriately in conversations both formal and informal
19148S41A	Probability And Queuing Theory	<p>Understand the fundamental knowledge of the concepts of probability and have knowledge of standard distributions which can describe real life phenomenon.</p> <ul style="list-style-type: none"> • Understand the basic concepts of one and two dimensional random variables and apply in engineering applications. • Apply the concept of random processes in engineering disciplines. • Acquire skills in analyzing queueing models • Understand and characterize phenomenon which evolve with respect to time in a probabilistic manner
19150C42	Computer Architecture	<p>Understand the basic structure of computers, operations and instructions.</p> <ul style="list-style-type: none"> • Design arithmetic and logic unit. • Understand pipelined execution and design control unit. • Understand parallel processing architectures • Understand the various memory systems and I/O communication.
19150C43	Database Management Systems	<p>Classify the modern and futuristic database applications based on size and complexity</p> <ul style="list-style-type: none"> • Map ER model to Relational model to perform database design effectively • Write queries using normalization criteria and optimize queries • Compare and contrast various indexing strategies in different database systems • Appraise how advanced databases differ from traditional databases
19150C44	Design And Analysis Of Algorithms	<p>Design algorithms for various computing problems.</p> <ul style="list-style-type: none"> • Analyze the time and space complexity of algorithms. • Critically analyze the different algorithm design techniques for a given problem. • Modify existing algorithms to improve efficiency.
19150C45	Operating Systems	<p>Analyze various scheduling algorithms.</p> <ul style="list-style-type: none"> • Understand deadlock, prevention and avoidance algorithms. • Compare and contrast various memory management schemes. • Understand the functionality of file systems. • Perform administrative tasks on Linux Servers. • Compare iOS and Android Operating Systems.
19150C46	Software Engineering	<p>Identify the key activities in managing a software</p>

Local Needs

Regional Needs

National Needs

Global Needs

		<p>project.</p> <ul style="list-style-type: none"> • Compare different process models. • Concepts of requirements engineering and Analysis Modeling. • Apply systematic procedure for software design and deployment. • Compare and contrast the various testing and maintenance. • Manage project schedule, estimate project cost and effort required
19150L47	Database Management Systems Laboratory	<p>Use typical data definitions and manipulation commands.</p> <ul style="list-style-type: none"> • Design applications to test Nested and Join Queries • Implement simple applications that use Views • Implement applications that require a Front-end Tool • Critically analyze the use of Tables, Views, Functions and Procedures
19150L48	Operating Systems Laboratory	<p>Compare the performance of various CPU Scheduling Algorithms</p> <ul style="list-style-type: none"> • Implement Deadlock avoidance and Detection Algorithms • Implement Semaphores • Create processes and implement IPC • Analyze the performance of the various Page Replacement Algorithms • Implement File Organization and File Allocation Strategies
19150L49	Advanced Reading And Writing	<p>Write different types of essays.</p> <ul style="list-style-type: none"> • Write winning job applications. 59 • Read and evaluate texts critically • Display critical thinking in various professional contexts
19148S51A	Algebra And Number Theory	<ul style="list-style-type: none"> • Apply the basic notions of groups, rings, fields which will then be used to solve related problems. • Explain the fundamental concepts of advanced algebra and their role in modern mathematics and applied contexts. • Demonstrate accurate and efficient use of advanced algebraic techniques. • Demonstrate their mastery by solving non - trivial problems related to the concepts, and by proving simple theorems about the, statements proven by the text. • Apply integrated approach to number theory and abstract algebra, and provide a firm basis for further reading and study in the subject.
19150C52	Computer Networks	<ul style="list-style-type: none"> • Understand the basic layers and its functions in computer networks. • Evaluate the performance of a network.

Local Needs

Regional Needs

National Needs

Global Needs

		<ul style="list-style-type: none"> Understand the basics of how data flows from one node to another Analyze and design routing algorithms Design protocols for various functions in the network. Understand the working of various application layer protocols.
19150C53	Microprocessors And Microcontrollers	<ul style="list-style-type: none"> Understand and execute programs based on 8086 microprocessor. Design Memory Interfacing circuits. Design and interface I/O circuits Design and implement 8051 microcontroller based systems.
19150E66A	Database Management Systems	<ul style="list-style-type: none"> Construct automata, regular expression for any pattern. Write Context free grammar for any construct. Design Turing machines for any language. Propose computation solutions using Turing machines. Derive whether a problem is decidable or not
19150E66B	Object Oriented Analysis And Design	<ul style="list-style-type: none"> Express software design with UML diagrams Design software applications using OO concepts. Identify various scenarios based on software requirements Transform UML based software design into pattern based design using design patterns Understand the various testing methodologies for OO software
19150E66C	Microprocessors And Microcontrollers Laboratory	<ul style="list-style-type: none"> Write ALP Programmes for fixed and Floating Point and Arithmetic operations Interface different I/Os with processor Generate waveforms using Microprocessors Execute Programs in 8051 Explain the difference between simulator and Emulator
19150E66D	Object Oriented Analysis And Design Laboratory	<ul style="list-style-type: none"> Perform OO analysis and design for a given problem specification. Identify and map basic software requirements in UML mapping. Improve the software quality using design patterns and to explain the rationale behind applying specific design patterns Test the compliance of the software with the SRS
19150E66E	Networks Laboratory	<ul style="list-style-type: none"> Implement various protocols using TCP and UDP. Compare the performance of different transport layer protocols. Use simulation tools to analyze the performance of various network protocols. Analyze various routing algorithms.

Local Needs

Regional Needs

National Needs

Global Needs

		<ul style="list-style-type: none"> • Implement error correction codes
19150C61	Internet Programming	<ul style="list-style-type: none"> • Construct a basic website using HTML and Cascading Style Sheets. • Build dynamic web page with validation using Java Script objects and by applying different event handling mechanisms. • Develop server side programs using Servlets and JSP. • Construct simple web pages in PHP and to represent data in XML format. • Use AJAX and web services to develop interactive web applications
19150C62	Artificial Intelligence	<ul style="list-style-type: none"> • Use appropriate search algorithms for any AI problem • Represent a problem using first order and predicate logic • Provide the apt agent strategy to solve a given problem • Design software agents to solve a problem • Design applications for NLP that use Artificial Intelligence.
19150C63	Mobile Computing	<ul style="list-style-type: none"> • Explain the basics of mobile telecommunication systems • Illustrate the generations of telecommunication systems in wireless networks • Determine the functionality of MAC, network layer and Identify a routing protocol for a given Ad hoc network • Explain the functionality of Transport and Application layers • Develop a mobile application using android/blackberry/ios/Windows SDK
19150C64	Compiler Design	<ul style="list-style-type: none"> • Understand the different phases of compiler • Design a lexical analyzer for a sample language. • Apply different parsing algorithms to develop the parsers for a given grammar. • Understand syntax-directed translation and run-time environment. • Learn to implement code optimization techniques and a simple code generator. • Design and implement a scanner and a parser using LEX and YACC tools.
19150C65	Distributed Systems	<ul style="list-style-type: none"> • Elucidate the foundations and issues of distributed systems • Understand the various synchronization issues and global state for distributed systems. • Understand the Mutual Exclusion and Deadlock detection algorithms in distributed systems • Describe the agreement protocols and fault

Local Needs

Regional Needs

National Needs

Global Needs

		<ul style="list-style-type: none"> tolerance mechanisms in distributed systems Describe the features of peer-to-peer and distributed shared memory systems
19150E66A	Data Warehousing And Data Mining	<ul style="list-style-type: none"> Design a Data warehouse system and perform business analysis with OLAP tools. Apply suitable pre-processing and visualization techniques for data analysis Apply frequent pattern and association rule mining techniques for data analysis Apply appropriate classification and clustering techniques for data analysis
19150E66B	Software Testing	<p>Design test cases suitable for a software development for different domains.</p> <ul style="list-style-type: none"> Identify suitable tests to be carried out. Prepare test planning based on the document Document test plans and test cases designed Use automatic testing tools. Develop and validate a test plan.
19150E66C	Embedded Systems	<p>Describe the architecture and programming of ARM processor.</p> <ul style="list-style-type: none"> Explain the concepts of embedded systems Understand the Concepts of peripherals and interfacing of sensors. Capable of using the system design techniques to develop firmware Illustrate the code for constructing a system
19150E66D	Graph Theory And Applications	<p>Understand the basic concepts of graphs, and different types of graphs</p> <ul style="list-style-type: none"> Understand the properties, theorems and be able to prove theorems. Apply suitable graph model and algorithm for solving applications.
19150E66E	Digital Signal Processing	<p>Perform mathematical operations on signals.</p> <ul style="list-style-type: none"> Understand the sampling theorem and perform sampling on continuous-time signals to get discrete time signal by applying advanced knowledge of the sampling theory. Transform the time domain signal into frequency domain signal and vice-versa. Apply the relevant theoretical knowledge to design the digital IIR/FIR filters for the given analog specifications.
19150L61	Internet Programming Laboratory	<p>Construct Web pages using HTML/XML and style sheets.</p> <ul style="list-style-type: none"> Build dynamic web pages with validation using Java Script objects and by applying different event handling mechanisms. Develop dynamic web pages using server side scripting. Use PHP programming to develop web applications.

Local Needs

Regional Needs

National Needs

Global Needs

		<ul style="list-style-type: none"> • Construct web applications using AJAX and web services.
19150L62	Mobile Application Development Laboratory	<ul style="list-style-type: none"> • Develop mobile applications using GUI and Layouts. • Develop mobile applications using Event Listener. • Develop mobile applications using Databases. • Develop mobile applications using RSS Feed, Internal/External Storage, SMS, Multithreading and GPS. • Analyze and discover own mobile app for simple needs.
19150L63	Professional Communication	<ul style="list-style-type: none"> • Make effective presentations • Participate confidently in Group Discussions. • Attend job interviews and be successful in them • Develop adequate Soft Skills required for the workplace
19150S71	Principles Of Management	<p>Upon completion of the course, students will be able to have clear understanding of managerial functions like planning, organizing, staffing, leading & controlling and have some basic knowledge on international aspect of management</p>
19150C72	Cryptography And Network Security	<ul style="list-style-type: none"> • Understand the fundamentals of networks security, security architecture, threats and vulnerabilities • Apply the different cryptographic operations of symmetric cryptographic algorithms • Apply the different cryptographic operations of public key cryptography • Apply the various Authentication schemes to simulate different applications. • Understand various Security practices and System security standards
19150C73	Cloud Computing	<ul style="list-style-type: none"> • Articulate the main concepts, key technologies, strengths and limitations of cloud computing. • Learn the key and enabling technologies that help in the development of cloud. • Develop the ability to understand and use the architecture of compute and storage cloud, service and delivery models. • Explain the core issues of cloud computing such as resource management and security. • Be able to install and use current cloud technologies. • Evaluate and choose the appropriate technologies, algorithms and approaches for implementation and use of cloud
19150E75A	Big Data Analytics	<ul style="list-style-type: none"> • Work with big data tools and its analysis techniques • Analyze data by utilizing clustering and classification algorithms • Learn and apply different mining algorithms and recommendation systems for large volumes of data • Perform analytics on data streams • Learn NoSQL databases and management.

Local Needs

Regional Needs

National Needs

Global Needs

19150E75B	Machine Learning Techniques	<p>Differentiate between supervised, unsupervised, semi-supervised machine learning approaches</p> <ul style="list-style-type: none"> • Discuss the decision tree algorithm and identify and overcome the problem of overfitting • Discuss and apply the back propagation algorithm and genetic algorithms to various problems • Apply the Bayesian concepts to machine learning • Analyse and suggest appropriate machine learning approaches for various types of problems
19150E75C	Software Project Management	<p>Understand Project Management principles while developing software.</p> <ul style="list-style-type: none"> • Gain extensive knowledge about the basic project management concepts, framework and the process models. • Obtain adequate knowledge about software process models and software effort estimation techniques. • Estimate the risks involved in various project activities. • Define the checkpoints, project reporting structure, project progress and tracking mechanisms using project management principles. • Learn staff selection process and the issues related to people management
19150E75D	Internet Of Things	<p>Explain the concept of IoT.</p> <ul style="list-style-type: none"> • Analyze various protocols for IoT. • Design a PoC of an IoT system using Raspberry Pi/Arduino • Apply data analytics and use cloud offerings related to IoT. • Analyze applications of IoT in real time scenario
19150E75E	Service Oriented Architecture	<p>Understand XML technologies</p> <ul style="list-style-type: none"> • Understand service orientation, benefits of SOA • Understand web services and WS standards • Use web services extensions to develop solutions • Understand and apply service modeling, service oriented analysis and design for application development
19150E76A	Multi Core Architectures And programming	<p>Describe multicore architectures and identify their characteristics and challenges.</p> <ul style="list-style-type: none"> • Identify the issues in programming Parallel Processors. • Write programs using OpenMP and MPI. • Design parallel programming solutions to common problems. • Compare and contrast programming for serial processors and programming for parallel processors.
19150E76B	Human Computer Interaction	<p>Design effective dialog for HCI</p> <ul style="list-style-type: none"> • Design effective HCI for individuals and persons with disabilities. • Assess the importance of user feedback. • Explain the HCI implications for designing multimedia/ e-commerce/ e-learning Web sites.

Local Needs

Regional Needs

National Needs

Global Needs

		<ul style="list-style-type: none"> • Develop meaningful user interface.
19150E76C	C# And .Net Programming	<p>Write various applications using C# Language in the .NET Framework.</p> <ul style="list-style-type: none"> • Develop distributed applications using .NET Framework. • Create mobile applications using .NET compact Framework
19150E76D	Wireless Adhoc And Sensor Networks	<p>Identify different issues in wireless ad hoc and sensor networks .</p> <ul style="list-style-type: none"> • To analyze protocols developed for ad hoc and sensor networks . • To identify and understand security issues in ad hoc and sensor networks.
19150E76E	Advanced Topics On Databases	<p>To develop in-depth understanding of relational databases and skills to optimize database performance in practice.</p> <ul style="list-style-type: none"> • To understand and critique on each type of databases. • To design faster algorithms in solving practical database problems. • To implement intelligent databases and various data models.
19150L77	Cloud Computing Laboratory	<p>Configure various virtualization tools such as Virtual Box, VMware workstation.</p> <ul style="list-style-type: none"> • Design and deploy a web application in a PaaS environment. • Learn how to simulate a cloud environment to implement new schedulers. • Install and use a generic cloud environment that can be used as a private cloud. • Manipulate large data sets in a parallel environment
19150L78	Security Laboratory	<p>Develop code for classical Encryption Techniques to solve the problems.</p> <ul style="list-style-type: none"> • Build cryptosystems by applying symmetric and public key encryption algorithms. • Construct code for authentication algorithms. • Develop a signature scheme using Digital signature standard. • Demonstrate the network security system using open source tools
19150E81A	DigitalImage Processing	<p>Know and understand the basics and fundamentals of digital image processing, such as digitization, sampling, quantization, and 2D-transforms.</p> <ul style="list-style-type: none"> • Operate on images using the techniques of smoothing, sharpening and enhancement. • Understand the restoration concepts and filtering techniques. • Learn the basics of segmentation, features extraction, compression and recognition methods for color models
19150E81B	Social Network Analysis	<p>Develop semantic web related applications.</p> <ul style="list-style-type: none"> • Represent knowledge using ontology.

Local Needs

Regional Needs

National Needs

Global Needs

		<ul style="list-style-type: none"> • Predict human behaviour in social web and related communities. • Visualize social networks
19150E81C	Information Security	<p>Discuss the basics of information security</p> <ul style="list-style-type: none"> • Illustrate the legal, ethical and professional issues in information security • Demonstrate the aspects of risk management. • Become aware of various standards in the Information Security System • Design and implementation of Security Techniques.
19150E81D	Cyber Forensics	<p>Understand the basics of computer forensics</p> <ul style="list-style-type: none"> • Apply a number of different computer forensic tools to a given scenario • Analyze and validate forensics data • Identify the vulnerabilities in a given network infrastructure • Implement real-world hacking techniques to test system security
19150E81E	Soft Computing	<ul style="list-style-type: none"> • Apply suitable soft computing techniques for various applications. • Integrate various soft computing techniques for complex problems
19150E82A	Information Retrieval Techniques	<p>Use an open source search engine framework and explore its capabilities</p> <ul style="list-style-type: none"> • Apply appropriate method of classification or clustering. • Design and implement innovative features in a search engine. • Design and implement a recommender system.
19150E82B	Natural Language Processing	<p>To tag a given text with basic Language features</p> <ul style="list-style-type: none"> • To design an innovative application using NLP components • To implement a rule based system to tackle morphology/syntax of a language • To design a tag set to be used for statistical processing for real-time applications • To compare and contrast the use of different statistical approaches for different types of NLP applications.
19150E82C	Parallel Algorithms	<p>Develop parallel algorithms for standard problems and applications.</p> <ul style="list-style-type: none"> • Analyse efficiency of different parallel algorithms.
19150E82D	Speech Processing	<p>Create new algorithms with speech processing</p> <ul style="list-style-type: none"> • Derive new speech models • Perform various language phonetic analysis • Create a new speech identification system • Generate a new speech recognition system
19150E82E	Fundamentals Of Nano Science	<ul style="list-style-type: none"> • Will familiarize about the science of nanomaterials • Will demonstrate the preparation of nanomaterials • Will

Local Needs

Regional Needs

National Needs

Global Needs

		develop knowledge in characteristic nanomaterial
19150P83	Project Work	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
19248S11A	Higher Mathematics	Identify different issues in wireless ad hoc and sensor networks . <ul style="list-style-type: none"> • To analyze protocols developed for ad hoc and sensor networks . • To identify and understand security issues in ad hoc and sensor networks.
19250C12	Modern Operating System	To develop in-depth understanding of relational databases and skills to optimize database performance in practice. <ul style="list-style-type: none"> • To understand and critique on each type of databases. • To design faster algorithms in solving practical database problems. • To implement intelligent databases and various data models.
19250C13	Parallel And High Performance Computing	Understand the basic concepts of graphs, and different types of graphs <ul style="list-style-type: none"> • Understand the properties, theorems and be able to prove theorems. • Apply suitable graph model and algorithm for solving applications
19250C14	Adhoc And Sensor Network	<ul style="list-style-type: none"> • Develop Java programs using OOP principles • Develop Java programs with the concepts inheritance and interfaces • Build Java applications using exceptions and I/O streams • Develop Java applications with threads and generics classes • Develop interactive
19250C15	Advanced Data Structures And Algorithms	Understand the basic concepts of graphs, and different types of graphs <ul style="list-style-type: none"> • Understand the properties, theorems and be able to prove theorems. • Apply suitable graph model and algorithm for solving applications
19250E16A	Multimedia Systems	To develop in-depth understanding of relational databases and skills to optimize database performance in practice. <ul style="list-style-type: none"> • To understand and critique on each type of databases. • To design faster algorithms in solving practical database problems. • To implement intelligent databases and various data models.
19250E16B	Genetic Algorithms	<ul style="list-style-type: none"> • Design a Data warehouse system and perform business analysis with OLAP tools. • Apply suitable pre-processing and visualization techniques for data analysis

Local Needs

Regional Needs

National Needs

Global Needs

		<ul style="list-style-type: none"> Apply frequent pattern and association rule mining techniques for data analysis Apply appropriate classification and clustering techniques for data analysis
19250E16C	Software Metrics	<p>To develop in-depth understanding of relational databases and skills to optimize database performance in practice.</p> <ul style="list-style-type: none"> To understand and critique on each type of databases. To design faster algorithms in solving practical database problems. To implement intelligent databases and various data models.
19250L17	Advanced Web Technologies Lab	<p>Understand XML technologies</p> <ul style="list-style-type: none"> Understand service orientation, benefits of SOA Understand web services and WS standards Use web services extensions to develop solutions Understand and apply service modeling, service oriented analysis and design for application development
19250CRS	Research Led Seminar	<p>Understand the basic concepts of graphs, and different types of graphs</p> <ul style="list-style-type: none"> Understand the properties, theorems and be able to prove theorems. Apply suitable graph model and algorithm for solving applications
19250C21	Middleware Technologies	<p>Describe the architecture and programming of ARM processor.</p> <ul style="list-style-type: none"> Explain the concepts of embedded systems Understand the Concepts of peripherals and interfacing of sensors. Capable of using the system design techniques to develop firmware Illustrate the code for constructing a system
19250C22	Object Oriented Software Engineering	<p>Write various applications using C# Language in the .NET Framework.</p> <ul style="list-style-type: none"> Develop distributed applications using .NET Framework. Create mobile applications using .NET compact Framework
19250C23	Digital Image Processing	<p>Identify different issues in wireless ad hoc and sensor networks .</p> <ul style="list-style-type: none"> To analyze protocols developed for ad hoc and sensor networks . To identify and understand security issues in ad hoc and sensor networks.
19250E24A	Advanced Distributed Computing	<p>To develop in-depth understanding of relational databases and skills to optimize database performance in practice.</p> <ul style="list-style-type: none"> To understand and critique on each type of databases. To design faster algorithms in solving practical database problems.

Local Needs

Regional Needs

National Needs

Global Needs

		<ul style="list-style-type: none"> • To implement intelligent databases and various data models.
19250E24B	Data Warehousing & Data Mining	<p>Identify the key activities in managing a software project.</p> <ul style="list-style-type: none"> • Compare different process models. • Concepts of requirements engineering and Analysis Modeling. • Apply systematic procedure for software design and deployment. • Compare and contrast the various testing and maintenance. <ul style="list-style-type: none"> • Manage project schedule, estimate project cost and effort required
19250E24C	Artificial Neural Networks	<p>Identify the key activities in managing a software project.</p> <ul style="list-style-type: none"> • Compare different process models. • Concepts of requirements engineering and Analysis Modeling. • Apply systematic procedure for software design and deployment. • Compare and contrast the various testing and maintenance. <ul style="list-style-type: none"> • Manage project schedule, estimate project cost and effort required
19250E25A	Service Oriented Architecture	<p>Articulate the main concepts, key technologies, strengths and limitations of cloud computing. • Identify the architecture, infrastructure and delivery models of cloud computing. • Explain the core issues of cloud computing such as security, privacy and interoperability. • Choose the appropriate technologies, algorithms and approaches for the related issues. • Facilitate Service Level Agreements (SLA).</p>
19250E25B	High Speed Networks	<p>Identify the key activities in managing a software project.</p> <ul style="list-style-type: none"> • Compare different process models. • Concepts of requirements engineering and Analysis Modeling. • Apply systematic procedure for software design and deployment. • Compare and contrast the various testing and maintenance. <ul style="list-style-type: none"> • Manage project schedule, estimate project cost and effort required
19250E25C	Embedded Systems	<p>Identify the key activities in managing a software project.</p> <ul style="list-style-type: none"> • Compare different process models. • Concepts of requirements engineering and Analysis Modeling. • Apply systematic procedure for software design and deployment. • Compare and contrast the various testing and

Local Needs

Regional Needs

National Needs

Global Needs

		<p>maintenance</p> <ul style="list-style-type: none"> • Manage project schedule, estimate project cost and effort required
19250L26	.Net Technologies Lab	<p>Identify the key activities in managing a software project.</p> <ul style="list-style-type: none"> • Compare different process models. • Concepts of requirements engineering and Analysis Modeling. • Apply systematic procedure for software design and deployment. • Compare and contrast the various testing and maintenance <ul style="list-style-type: none"> • Manage project schedule, estimate project cost and effort required
192TECWR	Technical Writing /Seminars	<ul style="list-style-type: none"> • Develop mobile applications using GUI and Layouts. • Develop mobile applications using Event Listener. • Develop mobile applications using Databases. • Develop mobile applications using RSS Feed, Internal/External Storage, SMS, Multithreading and GPS. • Analyze and discover own mobile app for simple needs.
19250CRM	Research Methodology	<ul style="list-style-type: none"> • Compare different process models. • Concepts of requirements engineering and Analysis Modeling.
19250CBR	Participation In Bounded Research	<p>Identify the key activities in managing a software project.</p> <ul style="list-style-type: none"> • Compare different process models. • Concepts of requirements engineering and Analysis Modeling. • Apply systematic procedure for software design and deployment. • Compare and contrast the various testing and maintenance. <ul style="list-style-type: none"> • Manage project schedule, estimate project cost and effort required
19250C31	Software Project Management	<p>Identify the key activities in managing a software project.</p> <ul style="list-style-type: none"> • Compare different process models. • Concepts of requirements engineering and Analysis Modeling. • Apply systematic procedure for software design and deployment. • Compare and contrast the various testing and maintenance. <ul style="list-style-type: none"> • Manage project schedule, estimate project cost and effort required
19250E32A	Cloud Computing	<p>Identify different issues in wireless ad hoc and sensor networks .</p>

Local Needs

Regional Needs

National Needs

Global Needs

		<ul style="list-style-type: none"> • To analyze protocols developed for ad hoc and sensor networks . • To identify and understand security issues in ad hoc and sensor networks
19250E32B	Information Security	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
19250E32C	Soft Computing	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
19250E33A	Advanced Database Technology	<ul style="list-style-type: none"> • Compare different process models. • Concepts of requirements engineering and Analysis Modeling.
19250E33B	Mobile Communication And Computing	To identify and understand security issues in ad hoc and sensor networks
19250E33C	Green Computing	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
19250E34A	Software Quality Assurance	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
19250E34B	Bio-Informatics	<ul style="list-style-type: none"> • Compare and contrast the various testing and maintenance. • Manage project schedule, estimate project cost and effort required
19250E34C	Wireless Application Protocols	<p>Identify different issues in wireless ad hoc and sensor networks .</p> <ul style="list-style-type: none"> • To analyze protocols developed for ad hoc and sensor networks . • To identify and understand security issues in ad hoc and sensor networks
19250P35	Project Work Phase - I	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
19250P41	Project Work Phase - Ii	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
19150C14P	Computer Architecture And Organization	<ul style="list-style-type: none"> • To implement a rule based system to tackle morphology/syntax of a language • To design a tag set to be used for statistical

Local Needs

Regional Needs

National Needs

Global Needs

19150C15P	Object Oriented Programming	<ul style="list-style-type: none"> • Develop Java programs using OOP principles • Develop Java programs with the concepts inheritance and interfaces • Build Java applications using exceptions and I/O streams • Develop Java applications with threads and generics classes • Develop interactive Java programs using swing
19148S21P	Numerical Methods	<ul style="list-style-type: none"> • Use both the limit definition and rules of differentiation to differentiate functions. • Apply differentiation to solve maxima and minima problems. • Evaluate integrals both by using Riemann sums and by using the Fundamental Theorem of Calculus. • Apply integration to compute multiple integrals, area, volume, integrals in polar coordinates, in addition to change of order and change of variables. • Evaluate integrals using techniques of integration, such as substitution, partial fractions and integration by parts. • Determine convergence/divergence of improper integrals and evaluate convergent improper integrals. • Apply various techniques in solving differential equations.
19150C22P	Microprocessors And Interfacing	<ul style="list-style-type: none"> • Understand and execute programs based on 8086 microprocessor. • Design Memory Interfacing circuits. • Design and interface I/O circuits <p>Design and implement 8051 microcontroller based systems</p>
19150C23P	Database Management Systems	<ul style="list-style-type: none"> • Classify the modern and futuristic database applications based on size and complexity • Map ER model to Relational model to perform database design effectively • Write queries using normalization criteria and optimize queries • Compare and contrast various indexing strategies in different database systems • Appraise how advanced databases differ from traditional databases

Local Needs

Regional Needs

National Needs

Global Needs

19150C24P	Design And Analysis Of Algorithm	<p>Design algorithms for various computing problems.</p> <ul style="list-style-type: none">• Analyze the time and space complexity of algorithms.• Critically analyze the different algorithm design techniques for a given problem.• Modify existing algorithms to improve efficiency
-----------	----------------------------------	--

Local Needs

Regional Needs

National Needs

Global Needs



Dept: COMPUTER SCIENCE AND ENGINEERING

BTECH (FT)- 2019R

Mapping of COs and POs

Course Code	Title of the Course	COs	POS												
			PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	
19147S11	COMMUNICATIVE ENGLISH	Read articles of a general kind in magazines and newspapers									✓	✓	✓		✓
		Participate effectively in informal conversations; introduce themselves and their friends and express opinions in English									✓	✓	✓		✓
		Comprehend conversations and short talks delivered in English									✓	✓	✓		✓
		Write short essays of a general kind and personal letters and emails in English.									✓	✓	✓		✓
19148S12	ENGINEERING MATHEMATICS – I	Use both the limit definition and rules of differentiation to differentiate functions.	✓	✓											
		Apply differentiation to solve maxima and minima problems	✓	✓	✓	✓	✓								
		Evaluate integrals both by using Riemann sums and by using the Fundamental	✓	✓	✓	✓									

		Theorem of Calculus													
		Apply integration to compute multiple integrals, area, volume, integrals in polar coordinates, in addition to change of order and change of variables	✓	✓	✓	✓									
		Evaluate integrals using techniques of integration, such as substitution, partial fractions and integration by parts.	✓	✓											
		Determine convergence/divergence of improper integrals and evaluate convergent improper integrals	✓	✓	✓										
		Apply various techniques in solving differential equations.	✓	✓	✓										
19149S13	ENGINEERING PHYSICS	The students will gain knowledge on the basics of properties of matter and its applications	✓	✓	✓										
		The students will acquire knowledge on the concepts of waves and optical devices and their applications in fibre optics,	✓	✓	✓	✓	✓								
		The students will have adequate knowledge on the concepts of thermal properties of materials and their	✓	✓	✓	✓	✓								

		applications in expansion joints and heat exchangers,													
		The students will get knowledge on advanced physics concepts of quantum theory and its applications in tunneling microscopes	✓	✓	✓	✓	✓								
		The students will understand the basics of crystals, their structures and different crystal growth techniques.	✓	✓	✓										
19149S14	ENGINEERING CHEMISTRY	The knowledge gained on engineering materials, fuels, energy sources and water treatment techniques will facilitate better understanding of engineering processes and applications for further learning	✓	✓	✓										
19150S16	PROBLEM SOLVING AND PYTHON PROGRAMMING	Develop algorithmic solutions to simple computational problems	✓	✓	✓			✓							
		Read, write, execute by hand simple Python programs	✓	✓	✓		✓	✓						✓	
		Structure simple Python programs for solving problems	✓	✓	✓		✓	✓							✓
		Decompose a Python program into functions.	✓	✓	✓		✓	✓							✓
		Represent compound data using Python lists, tuples,	✓	✓	✓		✓	✓							✓

		dictionaries												
		Read and write data from/to files in Python Programs	✓	✓	✓		✓	✓						✓
19154S15	ENGINEERING GRAPHICS	Familiarize with the fundamentals and standards of Engineering graphics	✓											
		Perform freehand sketching of basic geometrical constructions and multiple views of objects.		✓										
		Project orthographic projections of lines and plane surfaces			✓									
		Draw projections and solids and development of surfaces.			✓	✓				✓				
19150L17	PROBLEM SOLVING AND PYTHON PROGRAMMING LABORATORY	Write, test, and debug simple Python programs.	✓											
		Implement Python programs with conditionals and loops.		✓	✓									
		Develop Python programs step-wise by defining functions and calling them		✓	✓									
		Use Python lists, tuples, dictionaries for representing compound data.				✓	✓							
		Read and write data from/to files in Python.			✓									
19149L18	PHYSICS AND CHEMISTRY LABORATORY	Apply principles of elasticity, optics and thermal properties for engineering applications.	✓	✓	✓			✓					✓	

		The students will be outfitted with hands-on knowledge in the quantitative chemical analysis of water quality related parameters.			✓	✓	✓							✓
191VEA1 9	VALUE EDUCATION	Students will understand the importance of value based living.						✓	✓					
		Students will gain deeper understanding about the purpose of their life.						✓	✓					
		Students will understand and start applying the essential steps to become good leaders.									✓		✓	✓
		Students will emerge as responsible citizens with clear conviction to practice values and ethics in life.						✓	✓	✓				
		Students will become value based professionals.						✓	✓	✓				
		Students will contribute in building a healthy nation						✓	✓	✓				
19147S21	TECHNICAL ENGLISH	Read technical texts and write area- specific texts effortlessly							✓	✓	✓		✓	
		Listen and comprehend lectures and talks in their area of specialisation successfully							✓	✓	✓		✓	
		Speak appropriately and effectively in varied formal and informal contexts.							✓	✓	✓		✓	

		Write reports and winning job applications.								✓	✓	✓		✓
19148S22 A	ENGINEERING MATHEMATICS – II	Eigen values and eigenvectors, diagonalization of a matrix, Symmetric matrices, Positive definite matrices and similar matrices.		✓										
		Gradient, divergence and curl of a vector point function and related identities		✓		✓								
		Evaluation of line, surface and volume integrals using Gauss, Stokes and Green's theorems and their verification		✓	✓									
		Analytic functions, conformal mapping and complex integration		✓	✓	✓								
		Laplace transform and inverse transform of simple functions, properties, various related theorems and application to differential equations with constant coefficients.		✓		✓								
19149S23 A	PHYSICS FOR INFORMATION SCIENCE	Gain knowledge on classical and quantum electron theories, and energy band structures	✓	✓										
		Acquire knowledge on basics of semiconductor physics and its applications in various devices,	✓				✓							

		Get knowledge on magnetic properties of materials and their applications in data storage	✓		✓									
		Have the necessary understanding on the functioning of optical materials for optoelectronics		✓		✓	✓							
		Understand the basics of quantum structures and their applications in carbon electronics..			✓	✓								
19153S25 A	BASIC ELECTRICAL, ELECTRONICS AND MEASUREMENT ENGINEERING	Discuss the essentials of electric circuits and analysis.	✓	✓										
		Discuss the basic operation of electric machines and transformers	✓	✓										
		Introduction of renewable sources and common domestic loads.	✓	✓	✓									
		Introduction to measurement and metering for electric circuits.	✓	✓	✓									
19149S24 A	ENVIRONMENTAL SCIENCE AND ENGINEERING	Environmental Pollution or problems cannot be solved by mere laws. Public participation is an important aspect which serves the environmental Protection. One will obtain knowledge on the following							✓	✓	✓	✓		✓

		after completing the course.												
		Public awareness of environmental is at infant stage.						✓	✓	✓	✓			✓
		Ignorance and incomplete knowledge has lead to misconceptions						✓	✓	✓	✓			✓
		Development and improvement in std. of living has lead to serious environmental disasters						✓	✓	✓	✓			✓
19150S26 A	PROGRAMMING IN C	Develop simple applications in C using basic constructs	✓	✓	✓									
		Design and implement applications using arrays and strings	✓	✓	✓									
		Develop and implement applications in C using functions and pointers.		✓	✓									
		Develop applications in C using structures.		✓	✓									
		Design applications using sequential and random access file processing.		✓	✓									
19154L27	ENGINEERING PRACTICES LABORATORY	Fabricate carpentry components and pipe connections including plumbing works.	✓						✓				✓	
		Use welding equipments to join the structures. Carry out	✓		✓			✓			✓			

		the basic machining operations Make the models using sheet metal works												
		Illustrate on centrifugal pump, Air conditioner, operations of smithy, foundary and fittings Carry out basic home electrical works and appliances	✓	✓	✓	✓		✓						
		Measure the electrical quantities Elaborate on the components, gates, soldering practices.	✓	✓	✓	✓	✓		✓	✓				
19150L28 A	C - PROGRAMMING LAB	Develop C programs for simple applications making use of basic constructs, arrays and strings	✓	✓	✓									
		Develop C programs involving functions, recursion, pointers, and structures	✓	✓	✓	✓								
		Design applications using sequential and random access file processing	✓	✓	✓	✓	✓				✓			
19148C31 A	DISCRETE MATHEMATICS	Have knowledge of the concepts needed to test the logic of a program	✓	✓	✓									
		Have an understanding in identifying structures on many levels	✓		✓	✓								
		Be aware of a class of functions which transform a	✓	✓	✓	✓								✓

		finite set into another finite set which relates to input and output functions in computer science.													
		Be aware of the counting principles.	✓	✓	✓	✓	✓					✓		✓	
		Be exposed to concepts and properties of algebraic structures such as groups, rings and fields.	✓	✓	✓	✓	✓	✓	✓			✓			
19150C32	DIGITAL PRINCIPLES AND SYSTEM DESIGN	Simplify Boolean functions using KMap	✓	✓	✓	✓		✓	✓	✓					
		Design and Analyze Combinational and Sequential Circuits	✓	✓	✓	✓	✓	✓	✓	✓				✓	
		Implement designs using Programmable Logic Devices	✓	✓	✓	✓	✓	✓	✓	✓					✓
		Write HDL code for combinational and Sequential Circuits	✓	✓	✓	✓		✓	✓	✓					✓
19150C33	DATA STRUCTURES	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	✓	✓	✓							✓			
19150C34	OBJECT ORIENTED PROGRAMMING	Develop Java programs using OOP principles	✓	✓	✓	✓	✓							✓	
		Develop Java programs with	✓	✓	✓	✓	✓						✓	✓	

		the concepts inheritance and interfaces												
		Build Java applications using exceptions and I/O streams	✓	✓	✓	✓	✓						✓	✓
		Develop Java applications with threads and generics classes	✓	✓	✓	✓	✓				✓		✓	✓
		Develop interactive Java programs using swings	✓	✓	✓	✓	✓	✓			✓		✓	✓
19150C35	COMMUNICATION ENGINEERING	Apply analog and digital communication techniques	✓		✓	✓								✓
		Use data and pulse communication techniques.		✓							✓			✓
		Analyze Source and Error control coding.		✓							✓			✓
		Ability to comprehend and appreciate the significance and role of this course in the present contemporary world			✓									
19150L36	DATA STRUCTURES LABORATORY	Write functions to implement linear and non-linear data structure operations	✓											
		Suggest appropriate linear / non-linear data structure operations for solving a given problem	✓	✓	✓									
		Appropriately use the linear / non-linear data structure operations for a given problem	✓	✓	✓									
		Apply appropriate hash functions that result in a	✓	✓	✓	✓	✓							

		collision free scenario for data storage and retrieval													
19150L37	OBJECT ORIENTED PROGRAMMING LABORATORY	Develop and implement Java programs for simple applications that make use of classes, packages and interfaces	✓	✓	✓										
		Develop and implement Java programs with arraylist, exception handling and multithreading	✓	✓	✓	✓									
		Design applications using file processing, generic programming and event handling.		✓	✓		✓								
19150L38	DIGITAL SYSTEMS LABORATORY	Implement simplified combinational circuits using basic logic gates	✓												
		Implement combinational circuits using MSI devices		✓	✓										
		Implement sequential circuits like registers and counters		✓	✓	✓	✓								
		Simulate combinational and sequential circuits using HDL			✓										
19150L39	INTERPERSONAL SKILLS/LISTENING&SPEAKING	Listen and respond appropriately								✓	✓		✓		
		Participate in group discussions								✓	✓		✓		
		Make effective presentations								✓	✓		✓		
		Participate confidently and								✓	✓		✓		

		appropriately in conversations both formal and informal													
19148S41 A	PROBABILITY AND QUEUING THEORY	Understand the fundamental knowledge of the concepts of probability and have knowledge of standard distributions which can describe real life phenomenon	✓	✓	✓										
		Understand the basic concepts of one and two dimensional random variables and apply in engineering applications		✓	✓										
		Apply the concept of random processes in engineering disciplines		✓	✓										
		Acquire skills in analyzing queueing models.		✓	✓										
		Understand and characterize phenomenon which evolve with respect to time in a probabilistic manner		✓	✓										
19150C42	COMPUTER ARCHITECTURE	Understand the basics structure of computers, operations and instructions.	✓	✓	✓	✓									
		Design arithmetic and logic unit.	✓	✓	✓	✓									
		Understand pipelined execution and design control unit.	✓	✓	✓	✓									
		Understand parallel processing	✓	✓	✓	✓									

		architectures.												
		Understand the various memory systems and I/O communication	✓	✓	✓	✓								
19150C43	DATABASE MANAGEMENT SYSTEMS	Classify the modern and futuristic database applications based on size and complexity	✓	✓		✓		✓	✓					
		Map ER model to Relational model to perform database design effectively	✓	✓										
		Write queries using normalization criteria and optimize queries	✓	✓	✓									
		Compare and contrast various indexing strategies in different database systems	✓	✓		✓		✓	✓					
		Appraise how advanced databases differ from traditional databases	✓	✓	✓	✓	✓	✓						
19150C44	DESIGN AND ANALYSIS OF ALGORITHMS	Design algorithms for various computing problems	✓			✓								
		Analyze the time and space complexity of algorithms.		✓	✓	✓								
		Critically analyze the different algorithm design techniques for a given problem		✓	✓	✓	✓							
		Modify existing algorithms to improve efficiency.		✓	✓		✓	✓						
19150C45	OPERATING SYSTEMS	Analyze various scheduling algorithms.	✓	✓	✓	✓	✓	✓						

		Understand deadlock, prevention and avoidance algorithms.	✓	✓	✓	✓	✓								
		Compare and contrast various memory management schemes.	✓	✓	✓	✓	✓								
		Understand the functionality of file systems.	✓	✓	✓	✓	✓								
		Perform administrative tasks on Linux Servers.	✓	✓	✓	✓	✓	✓	✓				✓	✓	
		Compare iOS and Android Operating Systems.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
19150C46	SOFTWARE ENGINEERING	Identify the key activities in managing a software project.	✓	✓	✓	✓					✓	✓	✓	✓	
		Compare different process models	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
		Concepts of requirements engineering and Analysis Modeling.	✓	✓	✓	✓	✓	✓	✓	✓		✓			
		Apply systematic procedure for software design and deployment.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
		Compare and contrast the various testing and maintenance	✓	✓	✓	✓	✓	✓	✓	✓					
		Manage project schedule, estimate project cost and effort required.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
19150L47	DATABASE MANAGEMENT SYSTEMS	Use typical data definitions and manipulation commands	✓	✓	✓						✓	✓	✓	✓	
		Design applications to test	✓	✓	✓						✓	✓	✓	✓	

	LABORATORY	Nested and Join Queries												
		Implement simple applications that use Views	✓	✓	✓						✓	✓	✓	✓
		Implement applications that require a Front-end Tool	✓	✓	✓						✓	✓	✓	✓
		Critically analyze the use of Tables, Views, Functions and Procedures	✓	✓	✓						✓	✓	✓	✓
19150L48	OPERATING SYSTEMS LABORATORY	Compare the performance of various CPU Scheduling Algorithms	✓	✓	✓		✓			✓	✓	✓		✓
		Implement Deadlock avoidance and Detection Algorithms	✓	✓	✓		✓			✓	✓	✓		✓
		Implement Semaphores	✓	✓	✓		✓			✓	✓	✓		✓
		Create processes and implement IPC	✓	✓	✓		✓			✓	✓	✓		✓
		Analyze the performance of the various Page Replacement Algorithms	✓	✓	✓		✓			✓	✓	✓		✓
		Implement File Organization and File Allocation Strategies	✓	✓	✓		✓			✓	✓	✓		✓
19150L49	ADVANCED READING AND WRITING	Write winning job applications.	✓								✓	✓		✓
		Read and evaluate texts critically.	✓								✓	✓		✓
		Display critical thinking in various professional contexts	✓								✓	✓		✓
		Write different types of essays.	✓					✓	✓	✓	✓	✓		✓
19150CRS	RESEARCH LED	Exposure to various research domains	✓	✓	✓	✓	✓							✓

	SEMINAR	Acquaintance with languages of research	✓	✓	✓	✓								✓	
		Development of research aptitude			✓	✓	✓							✓	
19148S51 A	ALGEBRA AND NUMBER THEORY	Apply the basic notions of groups, rings, fields which will then be used to solve related problems.	✓	✓	✓										
		Explain the fundamental concepts of advanced algebra and their role in modern mathematics and applied contexts.	✓	✓	✓										
		Demonstrate accurate and efficient use of advanced algebraic techniques.	✓	✓	✓	✓	✓								
		Demonstrate their mastery by solving non - trivial problems related to the concepts, and by proving simple theorems about the, statements proven by the text			✓	✓	✓	✓							
		Apply integrated approach to number theory and abstract algebra, and provide a firm basis for further reading and study in the subject.			✓	✓	✓	✓	✓						
	COMPUTER	Understand the basic layers and its functions in computer networks	✓	✓	✓	✓								✓	

19150C52	NETWORKS	Evaluate the performance of a network	✓	✓	✓	✓	✓						✓	✓	
		Understand the basics of how data flows from one node to another.	✓	✓	✓	✓									✓
		Analyze and design routing algorithms.	✓	✓	✓	✓	✓				✓	✓	✓	✓	✓
		Design protocols for various functions in the network.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
		Understand the working of various application layer protocols.	✓	✓	✓	✓									
19150C53	MICROPROCESSORS AND MICROCONTROLLERS	Understand and execute programs based on 8086 microprocessor.	✓	✓	✓	✓	✓	✓							
		Design Memory Interfacing circuits.	✓	✓	✓	✓									
		Design and interface I/O circuits.	✓	✓	✓	✓									
		Design and implement 8051 microcontroller based systems.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
19150C55	THEORY OF COMPUTATION	Construct automata, regular expression for any pattern.	✓	✓	✓									✓	
		Write Context free grammar for any construct.	✓	✓	✓	✓								✓	
		Design Turing machines for any language.	✓	✓	✓	✓		✓		✓			✓	✓	
		Propose computation solutions using Turing machines.	✓	✓	✓	✓		✓		✓			✓	✓	
		Derive whether a problem is	✓	✓	✓	✓		✓		✓			✓	✓	

		decidable or not.												
19150C56	OBJECT ORIENTED ANALYSIS AND DESIGN	Express software design with UML diagrams	✓	✓	✓		✓	✓		✓	✓	✓	✓	✓
		Design software applications using OO concepts.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
		Identify various scenarios based on software requirements	✓	✓	✓	✓								
		Transform UML based software design into pattern based design using design patterns	✓	✓	✓	✓	✓	✓	✓					
		Understand the various testing methodologies for OO software	✓	✓	✓	✓	✓		✓	✓				✓
19150CRM	Research methodology	Understanding research questions and tools	✓	✓		✓								
		Experience in scientific writings	✓	✓	✓	✓								
		Practice in various aspects of scientific publications Inculcation of research ethics	✓	✓	✓	✓								
			✓	✓	✓	✓				✓				
19150L57	MICROPROCESSORS AND MICROCONTROLLERS LABORATORY	Write ALP Programmes for fixed and Floating Point and Arithmetic operations						✓						
		Interface different I/Os with processor								✓			✓	
		Generate waveforms using Microprocessors	✓			✓					✓			
		Execute Programs in 8051			✓							✓		

		Explain the difference between simulator and Emulator	✓					✓		✓			✓		
19150L58	OBJECT ORIENTED ANALYSIS AND DESIGN LABORATORY	Perform OO analysis and design for a given problem specification.	✓	✓	✓	✓					✓				
		Identify and map basic software requirements in UML mapping.		✓	✓	✓					✓		✓	✓	
		Improve the software quality using design patterns and to explain the rationale behind applying specific design patterns		✓	✓	✓			✓		✓	✓	✓	✓	
		Test the compliance of the software with the SRS		✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	
19150L59	NETWORKS LABORATORY	Implement various protocols using TCP and UDP.	✓	✓	✓			✓						✓	
		Compare the performance of different transport layer protocols.	✓		✓										✓
		Use simulation tools to analyze the performance of various network protocols.	✓	✓		✓	✓	✓						✓	✓
		Analyze various routing algorithms.	✓	✓			✓		✓			✓	✓	✓	
		Implement error correction codes.	✓		✓	✓		✓	✓		✓	✓	✓	✓	
19150C61	INTERNET	Construct a basic website using HTML and Cascading Style	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	

	PROGRAMMING	Sheets.													
		Build dynamic web page with validation using Java Script objects and by applying different event handling mechanisms.	✓	✓	✓	✓	✓	✓					✓	✓	
		Develop server side programs using Servlets and JSP.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
		Construct simple web pages in PHP and to represent data in XML format.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
		Use AJAX and web services to develop interactive web applications	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
19150C62	ARTIFICIAL INTELLIGENCE	Use appropriate search algorithms for any AI problem	✓	✓	✓	✓									
		Represent a problem using first order and predicate logic	✓	✓	✓		✓	✓	✓						
		Provide the apt agent strategy to solve a given problem	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
		Design software agents to solve a problem	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
		Design applications for NLP that use Artificial Intelligence.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
19150C63	MOBILE COMPUTING	Explain the basics of mobile telecommunication systems	✓	✓	✓	✓									
		Illustrate the generations of telecommunication systems in wireless networks	✓	✓	✓										
		Determine the functionality of	✓	✓	✓	✓	✓								

		MAC, network layer and Identify a routing protocol for a given Ad hoc network													
		Explain the functionality of Transport and Application layers	✓	✓	✓	✓									
		Develop a mobile application using android/blackberry/ios/Windows SDK	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
19150C64	COMPILER DESIGN	Understand the different phases of compiler.	✓	✓	✓	✓	✓								
		Design a lexical analyzer for a sample language.	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	
		Apply different parsing algorithms to develop the parsers for a given grammar.	✓	✓	✓	✓				✓	✓	✓			
		Understand syntax-directed translation and run-time environment.	✓	✓	✓	✓	✓								
		Learn to implement code optimization techniques and a simple code generator.	✓	✓	✓	✓	✓	✓	✓						
		Design and implement a scanner and a parser using LEX and YACC tools.	✓	✓	✓	✓	✓			✓	✓	✓	✓	✓	✓
19150C65	DISTRIBUTED SYSTEMS	Elucidate the foundations and issues of distributed systems	✓	✓	✓										
		Understand the various synchronization issues and	✓	✓	✓	✓									

		global state for distributed systems.												
		Understand the Mutual Exclusion and Deadlock detection algorithms in distributed systems	✓	✓	✓	✓	✓							
		Describe the agreement protocols and fault tolerance mechanisms in distributed systems.		✓	✓	✓	✓	✓						
		Describe the features of peer-to-peer and distributed shared memory systems		✓	✓	✓	✓	✓						
19150L61	INTERNET PROGRAMMING LABORATORY	Construct Web pages using HTML/XML and style sheets.	✓	✓	✓		✓	✓	✓	✓	✓	✓		✓
		Build dynamic web pages with validation using Java Script objects and by applying different event handling mechanisms.	✓	✓	✓	✓	✓		✓	✓	✓			✓
		Develop dynamic web pages using server side scripting.	✓	✓	✓	✓	✓		✓	✓	✓			✓
		Use PHP programming to develop web applications.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
		Construct web applications using AJAX and web services.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
19150L62	MOBILE APPLICATION DEVELOPMENT LABORATORY	Develop mobile applications using GUI and Layouts.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
		Develop mobile applications using Event Listener.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

		Develop mobile applications using Databases.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
		Develop mobile applications using RSS Feed, Internal/External Storage, SMS, Multi-threading and GPS.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
		Analyze and discover own mobile app for simple needs.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
		take up any challenging practical problems and find solution by formulating proper methodology	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
19150L63	MINI PROJECT	apply the knowledge of all related courses in providing hardware/software solutions	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
19150L64	PROFESSIONAL COMMUNICATION	Make effective presentations	✓					✓		✓	✓	✓	✓	✓
		Participate confidently in Group Discussions.	✓					✓	✓	✓	✓	✓	✓	✓
		Attend job interviews and be successful in them.	✓					✓	✓	✓	✓	✓	✓	✓
		Develop adequate Soft Skills required for the workplace	✓		✓			✓	✓	✓	✓	✓	✓	✓
19150CB R	Participation in Bounded Research	Hands on exposure to problem solving tools in contemporary research	✓	✓	✓	✓								
		Evolution of research intuitiveness and orientation	✓	✓	✓	✓								
		Familiarity with cutting edge research trends	✓	✓	✓	✓	✓							

19150C71	PRINCIPLES OF MANAGEMENT	to have clear understanding of managerial functions like planning, organizing, staffing, leading & controlling and have same basic knowledge on international aspect of management	✓						✓	✓	✓	✓	✓	✓	✓	
		Understand the fundamentals of networks security, security architecture, threats and vulnerabilities	✓	✓					✓	✓	✓	✓	✓	✓	✓	✓
19150C72	CRYPTOGRAPHY AND NETWORK SECURITY	Apply the different cryptographic operations of symmetric cryptographic algorithms	✓	✓	✓				✓							
		Apply the different cryptographic operations of public key cryptography	✓	✓	✓			✓	✓							
		Apply the various Authentication schemes to simulate different applications.	✓	✓	✓	✓	✓	✓	✓							✓
		Understand various Security practices and System security standards	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
		Articulate the main concepts, key technologies, strengths and limitations of cloud computing.	✓		✓											
		Learn the key and enabling technologies that help in the development of cloud.	✓	✓	✓											

19150C73	CLOUD COMPUTING	Develop the ability to understand and use the architecture of compute and storage cloud, service and delivery models.	✓	✓	✓	✓					✓				
		Explain the core issues of cloud computing such as resource management and security.	✓	✓	✓		✓	✓			✓				✓
		Be able to install and use current cloud technologies.	✓	✓	✓	✓	✓	✓			✓				✓
		Evaluate and choose the appropriate technologies, algorithms and approaches for implementation and use of cloud.	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓
19150L77	CLOUD COMPUTING LABORATORY	Configure various virtualization tools such as Virtual Box, VMware workstation.	✓	✓	✓	✓	✓								
		Design and deploy a web application in a PaaS environment.	✓	✓	✓	✓	✓								
		Learn how to simulate a cloud environment to implement new schedulers.	✓	✓	✓	✓	✓				✓		✓		
		Install and use a generic cloud environment that can be used as a private cloud.	✓	✓	✓	✓	✓								✓
		Manipulate large data sets in a	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

		parallel environment.												
19150L78	SECURITY LABORATORY	Develop code for classical Encryption Techniques to solve the problems.	✓	✓	✓		✓							
		Build cryptosystems by applying symmetric and public key encryption algorithms.	✓	✓	✓	✓	✓							
		Construct code for authentication algorithms.	✓	✓	✓	✓	✓	✓						✓
		Develop a signature scheme using Digital signature standard.	✓	✓	✓	✓	✓	✓				✓		✓
		Demonstrate the network security system using open source tools	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
19150P83	Project Work	Identify the problem by applying acquired knowledge.	✓	✓		1		✓	✓	✓				
		Analyze and categorize executable project modules after considering risks.		✓	✓	✓		✓	✓		✓	✓	✓	
		Choose efficient tools for designing project modules.			✓	✓	✓			✓	✓	✓	✓	✓
		Combine all the modules through effective team work after efficient testing.							✓	✓	✓	✓	✓	✓
19150E66 A	DATA WAREHOUSING AND DATA MINING	Design a Data warehouse system and perform business analysis with OLAP tools.	✓	✓	✓									
		Apply suitable pre-processing and visualization techniques	✓	✓	✓		✓							

		for data analysis												
		Apply frequent pattern and association rule mining techniques for data analysis	✓	✓	✓	✓	✓				✓			
		Apply appropriate classification and clustering techniques for data analysis	✓	✓	✓	✓	✓			✓	✓	✓	✓	✓
19150E66 B	SOFTWARE TESTING	Design test cases suitable for a software development for different domains.	✓	✓	✓						✓			✓
		Identify suitable tests to be carried out.	✓	✓	✓	✓					✓			✓
		Prepare test planning based on the document.	✓	✓	✓	✓			✓		✓	✓		✓
		Document test plans and test cases designed	✓	✓	✓	✓	✓			✓	✓	✓		✓
		Use automatic testing tools. · Develop and validate a test plan.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
19150E66 C	COMPUTER GRAPHICS AND MULTIMEDIA	Design two dimensional graphics.	✓	✓	✓									
		Apply two dimensional transformations.	✓	✓	✓	✓	✓							
		Design three dimensional graphics.	✓	✓	✓	✓	✓							
		Apply three dimensional transformations.	✓	✓	✓	✓	✓		✓			✓		✓
		Apply Illumination and color models.	✓	✓	✓	✓	✓	✓				✓		✓
		Apply clipping techniques to	✓	✓	✓	✓						✓	✓	

		graphics.													
		Understood Different types of Multimedia File Format	✓	✓	✓	✓	✓				✓			✓	
		Design Basic 3d Scenes using Blender	✓	✓	✓	✓	✓				✓	✓			
19150E66 D	GRAPH THEORY AND APPLICATIONS	Understand the basic concepts of graphs, and different types of graphs	✓	✓	✓	✓	✓								
		Understand the properties, theorems and be able to prove theorems.	✓	✓	✓				✓		✓				
		Apply suitable graph model and algorithm for solving applications.	✓	✓	✓	✓	✓				✓				
19150E75 A	BIG DATA ANALYTICS	Work with big data tools and its analysis techniques	✓	✓	✓		✓				✓				
		Analyze data by utilizing clustering and classification algorithms	✓	✓	✓	✓	✓							✓	
		Learn and apply different mining algorithms and recommendation systems for large volumes of data	✓	✓	✓	✓				✓	✓				✓
		Perform analytics on data streams	✓	✓	✓	✓	✓					✓		✓	✓
		Learn NoSQL databases and management.	✓	✓	✓	✓	✓						✓		✓
19150E75 B	MACHINE LEARNING TECHNIQUES	Differentiate between supervised, unsupervised, semi-supervised machine	✓	✓	✓										

		learning approaches												
		Discuss the decision tree algorithm and identify and overcome the problem of overfitting	✓	✓	✓	✓								
		Discuss and apply the back propagation algorithm and genetic algorithms to various problems	✓	✓	✓	✓	✓	✓		✓	✓			
		Apply the Bayesian concepts to machine learning	✓	✓	✓		✓			✓		✓		
		Analyse and suggest appropriate machine learning approaches for various types of problems	✓	✓	✓	✓	✓							
19150E75 C	SOFTWARE PROJECT MANAGEMENT	Understand Project Management principles while developing software.	✓	✓										
		Gain extensive knowledge about the basic project management concepts, framework and the process models.	✓	✓	✓									
		Obtain adequate knowledge about software process models and software effort estimation techniques.	✓	✓	✓		✓			✓				✓
		Estimate the risks involved in various project activities.	✓	✓	✓	✓	✓			✓			✓	
		Define the checkpoints,	✓	✓	✓	✓								

		project reporting structure, project progress and tracking mechanisms using project management principles.												
		Learn staff selection process and the issues related to people management	✓	✓	✓	✓	✓							
19150E75 D	SERVICE ORIENTED ARCHITECTURE	Understand XML technologies	✓			✓								
		Understand service orientation, benefits of SOA	✓	✓	✓									
		Understand web services and WS standards	✓		✓					✓		✓		✓
		Use web services extensions to develop solutions	✓	✓	✓		✓					✓		✓
		Understand and apply service modeling, service oriented analysis and design for application development	✓	✓		✓	✓					✓		✓
19150E76 A	INTERNET OF THINGS	Explain the concept of IoT.	✓	✓										
		Analyze various protocols for IoT.	✓	✓	✓	✓	✓							✓
		Design a PoC of an IoT system using Raspberry Pi/Arduino	✓	✓	✓			✓		✓		✓		✓
		Apply data analytics and use cloud offerings related to IoT.	✓	✓	✓	✓								
		Analyze applications of IoT in real time scenario	✓	✓	✓	✓	✓							
19150E76 B	MULTI-CORE ARCHITECTURE	Describe multicore architectures and identify their	✓	✓										

	S AND PROGRAMMING	characteristics and challenges.													
		Identify the issues in programming Parallel Processors.	✓		✓										✓
		Write programs using OpenMP and MPI.	✓	✓	✓	✓					✓				✓
		Design parallel programming solutions to common problems.	✓	✓	✓		✓				✓				✓
		Compare and contrast programming for serial processors and programming for parallel processors.	✓	✓		✓	✓	✓				✓			
19150E76 C	HUMAN COMPUTER INTERACTION	Design effective dialog for HCI	✓												
		Design effective HCI for individuals and persons with disabilities.	✓	✓											
		Assess the importance of user feedback.	✓		✓	✓	✓				✓				
		Explain the HCI implications for designing multimedia/ e-commerce/ e-learning Web sites.	✓	✓	✓	✓	✓				✓				✓
		Develop meaningful user interface.	✓		✓	✓	✓								
19150E76 D	WIRELESS ADHOC AND SENSOR NETWORKS	To identify and understand security issues in ad hoc and sensor networks	✓												
		To analyze protocols developed for ad hoc and	✓	✓	✓	✓	✓							✓	

		sensor networks												
		Identify different issues in wireless ad hoc and sensor networks	✓	✓	✓							✓	✓	
19150E81 A	DIGITAL IMAGE PROCESSING	Know and understand the basics and fundamentals of digital image processing, such as digitization, sampling, quantization, and 2D-transforms.	✓											
		Operate on images using the techniques of smoothing, sharpening and enhancement	✓	✓	✓				✓					
		Understand the restoration concepts and filtering techniques.	✓	✓	✓	✓								✓
		Learn the basics of segmentation, features extraction, compression and recognition methods for color models.	✓	✓	✓	✓	✓	✓	✓		✓	✓		✓
19150E81 B	SOCIAL NETWORK ANALYSIS	Represent knowledge using ontology.	✓		✓			✓	✓	✓	✓			
		Develop semantic web related applications.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
		Predict human behaviour in social web and related communities	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓
		Visualize social networks	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓
19150E81	INFORMATION	Discuss the basics of	✓				✓		✓		✓			

C	SECURITY	information security												
		Illustrate the legal, ethical and professional issues in information security	✓	✓	✓						✓		✓	✓
		Demonstrate the aspects of risk management	✓	✓	✓	✓	✓	✓			✓	✓		✓
		Become aware of various standards in the Information Security System	✓	✓	✓		✓		✓		✓	✓	✓	✓
		Design and implementation of Security Techniques.	✓	✓	✓	✓	✓				✓	✓	✓	✓
19150E81 D	CYBER FORENSICS	Understand the basics of computer forensics	✓							✓			✓	
		Apply a number of different computer forensic tools to a given scenario	✓	✓	✓							✓		✓
		Analyze and validate forensics data	✓	✓	✓	✓		✓		✓	✓	✓		✓
		Identify the vulnerabilities in a given network infrastructure	✓	✓	✓	✓	✓		✓	✓	✓	✓		✓
		Implement real-world hacking techniques to test system security.	✓	✓	✓		✓	✓		✓	✓	✓		✓
19150E82 A	INFORMATION RETRIEVAL TECHNIQUES	Use an open source search engine framework and explore its capabilities	✓											
		Apply appropriate method of classification or clustering.	✓	✓	✓									
		Design and implement innovative features in a search	✓	✓	✓		✓				✓			

		engine.												
		Design and implement a recommender system.	✓	✓	✓	✓	✓							
19150E82 CB	GPU ARCHITECTURE AND PROGRAMMING	Implement efficient algorithms in GPUs for common application kernels, such as matrix multiplication	✓		✓									
		Write simple programs using OpenCL	✓	✓	✓			✓				✓		
		Identify efficient parallel programming patterns to solve problems	✓	✓	✓	✓	✓							
		Describe GPU Architecture	✓	✓	✓	✓	✓					✓		✓
		Write programs using CUDA, identify issues and debug them	✓	✓	✓	✓	✓	✓		✓	✓			✓
19150E82 C	NATURAL LANGUAGE PROCESSING	To tag a given text with basic Language features	✓				✓							
		To design an innovative application using NLP components	✓	✓	✓						✓			✓
		To implement a rule based system to tackle morphology/syntax of a language	✓	✓	✓	✓		✓				✓		✓
		To design a tag set to be used for statistical processing for real-time applications	✓	✓	✓	✓		✓						✓
		To compare and contrast the use of different statistical approaches for different types	✓	✓				✓						

		of NLP applications												
19150E82 D	SPEECH PROCESSING	Create new algorithms with speech processing	✓											
		Derive new speech models	✓	✓	✓	✓				✓				
		Perform various language phonetic analysis	✓	✓	✓	✓	✓				✓	✓	✓	
		Create a new speech identification system	✓	✓	✓	✓	✓	✓			✓			✓
		Generate a new speech recognition system	✓	✓	✓	✓				✓				✓
1910P83	PROJECT WORK	Identify the problem by applying acquired knowledge	✓	✓		✓			✓	✓	✓			
		Analyze and categorize executable project modules after considering risks		✓	✓	✓	✓	✓	✓	✓	✓	✓		✓
		Choose efficient tools for designing project modules								✓	✓	✓	✓	✓
		Combine all the modules through effective team work after efficient testing							✓	✓	✓	✓	✓	✓
		Elaborate the completed task and compile the project report									✓	✓		✓
19150FE5 4A	CLOUD COMPUTING	Articulate the main concepts, key technologies, strengths and limitations of cloud computing.	✓					✓						
		Learn the key and enabling technologies that help in the development of cloud.	✓	✓	✓	✓	✓							
		Develop the ability to understand and use the	✓	✓	✓	✓					✓			

		architecture of compute and storage cloud, service and delivery models.													
		Explain the core issues of cloud computing such as resource management and security.	✓	✓	✓	✓		✓			✓			✓	
		Be able to install and use current cloud technologies.	✓	✓	✓		✓				✓			✓	
		Choose the appropriate technologies, algorithms and approaches for implementation and use of cloud.	✓	✓	✓		✓							✓	
19150FE5 4B	DATABASE MANAGEMENT SYSTEMS	understand relational data model, evolve conceptual model of a given problem, its mapping to relational model and Normalization	✓												
		query the relational database and write programs with database connectivity	✓	✓	✓										✓
		understand the concepts of database security and information retrieval systems	✓	✓	✓	✓	✓					✓			✓
19152FE5 4A	BASICS OF BIO MEDICAL INSTRUMENTA TION	To learn the different bio potential and its propagation	✓												
		To get Familiarize the different electrode placement for various physiological recording	✓	✓	✓										
		Students will be able design	✓	✓	✓	✓					✓			✓	

		bio amplifier for various physiological recording												
		Students will understand various technique non electrical physiological measurements	✓	✓	✓	✓	✓	✓						✓
		Understand the different biochemical measurements	✓	✓	✓	✓					✓	✓	✓	
19152FE5 4B	SENSORS AND TRANSDUCERS	Expertise in various calibration techniques and signal types for sensors	✓											
		Apply the various sensors in the Automotive and Mechatronics applications	✓	✓	✓									
		Study the basic principles of various smart sensors.	✓	✓	✓	✓	✓						✓	
		Implement the DAQ systems with different sensors for real time applications	✓	✓	✓	✓	✓							
19153FE5 4A	INDUSTRIAL NANO TECHNOLOGY	To elucidate on advantages of nanotechnology based applications in each industry	✓											
		To provide instances of contemporary industrial applications of nanotechnology	✓	✓	✓		✓	✓			✓			✓
		To provide an overview of future technological advancements and increasing role of nanotechnology in each industry	✓	✓	✓	✓	✓				✓			✓

19153FE5 4B	ENERGY CONSERVATION AND MANAGEMENT	To analyse the energy data of industries.	✓											✓
		Can carryout energy accounting and balancing	✓	✓	✓	✓		✓	✓		✓	✓		✓
		Can suggest methodologies for energy savings	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓
19154FE5 4A	RENEWABLE ENERGY SOURCES	Ability to classify the solar energy collectors and methodologies of storing solar energy.	✓											
		Knowledge in applying solar energy in a useful way.	✓	✓	✓									
		Knowledge in wind energy and biomass with its economic aspects.	✓	✓	✓	✓					✓	✓		✓
		Knowledge in capturing and applying other forms of energy sources like wind, biogas and geothermal energies.	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓
		Understanding the physics of solar radiation.	✓	✓	✓				✓		✓	✓	✓	✓
19154FE5 4B	AUTOMOTIVE SYSTEMS	the students will be able to identify the different components in automobile engineering	✓		✓	✓	✓							✓
		Have clear understanding on different auxiliary and transmission systems usual.	✓	✓	✓	✓	✓		✓	✓		✓		✓
19155FE5 4A	AIR POLLUTION AND CONTROL	Basic concepts of air quality management.	✓											

	ENGINEERING	Ability to identify, formulate and solve air and noise pollution problems.	✓	✓	✓									
		Ability to design stacks and particulate air pollution control devices to meet applicable standards		✓	✓									
		Ability to select control equipments		✓	✓	✓	✓			✓				
		Ability to ensure quality, control and preventive measures.		✓	✓		✓	✓		✓				
19155FE5 4B	GEOGRAPHIC INFORMATION SYSTEMS	Have basic idea about the fundamentals of GIS.	✓											
		Understand the types of data models.	✓	✓	✓			✓						
		Get knowledge about data input and topology.	✓	✓	✓			✓		✓				✓
		Gain knowledge on data quality and standards.	✓	✓	✓	✓	✓			✓		✓	✓	✓
		Understand data management functions and data output	✓	✓	✓				✓			✓		✓
19152FE7 4A	ROBOTICS	Apply the basic engineering knowledge for the design of robotics	✓	✓	✓	✓	✓							
		understand importance of robotics in today and future goods production	✓	✓	✓	✓								
		understand robot configuration and subsystems	✓	✓	✓									

		understand principles of robot programming and handle with typical robot	✓	✓	✓	✓									
		understand working of mobile robots	✓	✓	✓	✓									
19152FE7 4B	ELECTRONIC DEVICES	Analyze the characteristics of semiconductor diodes.	✓	✓	✓	✓									
		Analyze and solve problems of Transistor circuits using model parameters.	✓	✓	✓										
		Identify and characterize diodes and various types of transistors.	✓	✓	✓										
		Analyze the characteristics of special semiconductor devices.	✓	✓	✓										
		Analyze the characteristics of Power and Display devices.	✓	✓	✓										
			✓	✓	✓	✓									
19153FE7 4A	BASIC CIRCUIT THEORY	Ability to introduce electric circuits and its analysis	✓	✓	✓	✓									
		Ability to impart knowledge on solving circuit equations using network theorems	✓	✓	✓	✓									
		Ability to introduce the phenomenon of resonance in coupled circuits.	✓	✓	✓	✓									
		Ability to introduce Phasor diagrams and analysis of three phase circuits	✓	✓	✓	✓									
19153FE7	INTRODUCTION	Ability to understand and	✓	✓	✓	✓									

4B	TO RENEWABLE ENERGY SYSTEM	analyze power system operation, stability, control and protection.													
		Ability to handle the engineering aspects of electrical energy generation and utilization.	✓	✓	✓										
		Ability to understand the stand alone and grid connected renewable energy systems.	✓	✓	✓	✓									
		Ability to design of power converters for renewable energy applications.	✓	✓	✓	✓	✓								
		Ability to acquire knowledge on wind electrical generators and solar energy systems.	✓	✓	✓	✓									
		Ability to design power converters used for hybrid renewable energy systems.	✓	✓	✓	✓									
19154FE7 4A	INDUSTRIAL SAFETY	Illustrate and familiarize the basic concepts and scope of engineering safety.	✓	✓				✓	✓	✓					
		Understand the standards of professional conduct that are published by professional safety organizations and certification bodies.							✓	✓	✓				
		Illustrate the importance of safety of employees while working with machineries.							✓	✓	✓				

19154FE7 4B	TESTING OF MATERIALS	Reproduce the basic knowledge of mathematics and engineering in finding the strength in tension, compression, shear and torsion.	✓	✓	✓	✓										
		Identify, formulate and solve engineering problems of structural elements subjected to flexure.						✓	✓	✓						
		Evaluate the impact of engineering solutions on the society and also will be aware of contemporary issues regarding failure of structures due to unsuitable materials.			2											
19155FE7 4A	WASTE WATER MANAGEMENT	Will have knowledge about adsorption and oxidation process.	✓	✓	✓	✓										
		Will gain idea about various methods available for water treatment.	✓	✓	✓	✓										
		Will appreciate the necessity of water and acquire knowledge of preliminary treatment.	✓	✓	✓	✓			✓							
19155FE7 4B	GREEN BUILDING DESIGN	Students should be able to describe the importance and necessity of green building.	✓													
		Students should be able to assess a building on the norms available for green building.	✓	✓	✓	✓	✓	✓	✓	✓						

		Students should be able to suggest materials and technologies to improve energy efficiency of building.	✓	✓			✓	✓	✓	✓				
		Students should be able to design and assess building	✓	✓	3									
19150FE7 4A	INTRODUCTION TO C PROGRAMMING	Develop simple applications using basic constructs	✓	✓	✓									
		Develop applications using arrays and strings	✓	✓	✓	✓			✓		✓			✓
		Develop applications using functions and structures	✓	✓	✓	✓	✓			✓		✓	✓	✓
19150FE7 4B	DATA STRUCTURES AND ALGORITHMS	Implement linear data structures and solve problems using them	✓	✓	✓									
		Implement and apply trees and graphs to solve problems.	✓	✓	✓	✓				✓	✓			✓
		Implement the various searching and sorting algorithms.	✓	✓	✓	✓	✓	✓				✓		✓



Dept: COMPUTER SCIENCE AND ENGINEERING

BTECH (PT)- 2019R

Mapping of COs and POs

Course Code	Title of the Course	Course Objectives	POS											
			PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
19148S11P	Transforms and Partial Differential Equations+C24	Expand a function in terms of Fourier Series and apply it for solving engineering problems.	✓	✓	✓	✓								
		Gain knowledge on Fourier Transforms	✓	✓	✓	✓								
		Model and solve higher order partial differential equations	✓	✓	✓	✓								
		Apply the methods of solving PDE in practical problems	✓	✓	✓	✓								
		Handle problems in Z transforms and apply it to solve difference equations	✓	✓	✓	✓								
19152S12P	Digital Systems	Simplify Boolean functions using KMap	✓	✓	✓									
		Design and Analyze Combinational and Sequential Circuits	✓	✓	✓									
		Implement designs using Programmable Logic Devices	✓	✓	✓	✓								

		Write HDL code for combinational and Sequential Circuits	✓	✓	✓	✓	✓								
19150H13P	Data Structures and algorithms	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	✓	✓	✓	✓									
19150H14P	Computer Architecture and Organization	Understand the basics structure of computers, operations and instructions	✓	✓	✓										
		Design arithmetic and logic unit.	✓	✓	✓										
		Understand pipelined execution and design control unit.	✓	✓	✓										
		Understand parallel processing architectures.	✓	✓	✓	✓	✓	✓						✓	✓
19150H15P	Object Oriented Programming	Develop and implement Java programs for simple applications that	✓	✓	✓										
		make use of classes, packages and interfaces.	✓	✓	✓							✓			
		Develop and implement Java programs with arraylist, exception	✓	✓	✓							✓		✓	✓
		Determine the solution of algebraic and transcendental system of linear equations	✓	✓											

19150H21P	Numerical Methods	To interpolate the values of unknown functions using Newton's Formula	✓	✓		✓								
		Estimate the numerical values of the derivatives and integrals of Unknown function	✓	✓		✓								
		Solve first and second order initial value problem	✓	✓	✓	✓								
		Solve Numerically boundary value problem	✓	✓	✓	✓								
19150H22P	Microprocessors and Interfacing	Understand and execute programs based on 8086/8085 microprocessor.	✓	✓	✓									
		Classify the instructions with the help of Addressing modes of 8085 with necessary programs	✓	✓	✓									
		Design Memory Interfacing circuits.	✓	✓	✓	✓	✓	✓						
		Design and interface I/O circuits.	✓	✓	✓	✓								
		Design and implement 8051 microcontroller based systems.	✓	✓	✓	✓	✓							✓
		Classify the modern and futuristic database applications based on size and complexity	✓	✓	✓									
		Map ER model to Relational model to perform database design	✓	✓	✓									

19150H23P	Database Management Systems	effectively														
		Write queries using normalization criteria and optimize queries	✓	✓	✓											
		Compare and contrast various indexing strategies in different database systems	✓	✓	✓	✓										✓
		Appraise how advanced databases differ from traditional databases.	✓	✓	✓	✓	✓									✓
19150H24P	Design and Analysis Of Algorithms	Design algorithms for various computing problems. Analyze the time and space complexity of algorithms.	✓	✓	✓	✓										
		Critically analyze the different algorithm design techniques for a given problem	✓	✓	✓	✓										✓
		Modify existing algorithms to improve efficiency	✓	✓	✓	✓										✓
19150H25P	Software Engineering	Identify the key activities in managing a software project.	✓	✓	✓											
		Compare different process models	✓	✓	✓											
		Understand Concepts of requirements engineering and Analysis Modeling.	✓	✓	✓											
		Apply systematic procedure for software	✓	✓	✓	✓	✓									

		design and deployment														
		Compare and contrast the various testing and maintenance	✓	✓	✓	✓	✓									
		Manage project schedule, estimate project cost and effort requir	✓	✓	✓	✓	✓									
19148S31P	Discrete Mathematics	Have an understanding in identifying structures on many levels.	✓	✓	✓											
		Be aware of a class of functions which transform a finite set into another finite set which relates to input and output functions in computer science.	✓	✓	✓											
		Be aware of the counting principles.	✓	✓	✓											
		Be exposed to concepts and properties of algebraic structures such as groups, rings and fields.	✓	✓	✓											
		Have knowledge of the concepts needed to test the logic of a program.	✓	✓	✓											✓
		Analyze various scheduling algorithms.	✓	✓	✓											
19150H32P	Operating System	Understand deadlock, prevention and avoidance algorithms.	✓	✓	✓											
		Perform administrative tasks on Linux Servers.	✓	✓	✓	✓	✓									

		Compare and contrast various memory management schemes.	✓	✓	✓	✓	✓								
		Understand the functionality of file systems.	✓	✓	✓	✓	✓	✓							✓
		Compare iOS and Android Operating Systems	✓	✓	✓	✓	✓	✓							✓
19150H33P	Artificial Intelligence	Identify problems that are amenable to solution by AI methods.	✓	✓	✓										
		Identify appropriate AI methods to solve a given problem.	✓	✓	✓	✓	✓								
		Formalise a given problem in the language/framework of different AI methods.	✓	✓	✓	✓	✓								
		Implement basic AI algorithms.	✓	✓	✓	✓	✓								✓
		Design and carry out an empirical evaluation of different algorithms on a problem formalisation, and state the conclusions that the evaluation supports.	✓	✓	✓	✓	✓								
19150H34P	Computer Networks	Identify the components required to build different types of networks	✓	✓	✓										
		Choose the required functionality at each layer for given application	✓	✓	✓										

		Identify solution for each functionality at each layer	✓	✓	✓	✓	✓				✓			✓
		Trace the flow of information from one node to another node in the network	✓	✓	✓	✓	✓				✓			✓
19150L35P	Operating Systems and Networking	Analyze various scheduling algorithms.	✓	✓	✓									
		Understand deadlock, prevention and avoidance algorithms.	✓	✓	✓									
		Identify the components required to build different types of networks	✓	✓	✓	✓	✓							✓
		Choose the required functionality at each layer for given application	✓	✓	✓	✓	✓		✓		✓			✓
19150H41P	Principles Of Cryptography	Apply cryptographic algorithms for encrypting and decryption for secure data transmission	✓	✓	✓									
		Understand the importance of Digital signature for secure edocuments exchange	✓	✓	✓									
		Understand the program threats and apply good programming practice	✓	✓	✓			✓						
		Get the knowledge about the security services available for internet and web	✓	✓	✓	✓	✓							✓

		applications												
		Understand data vulnerability and sql injection Gain the knowledge of security models and published standards	✓	✓	✓	✓	✓	✓					✓	
19150H42P	Web Technology	Design simple web pages using markup languages like HTML and XHTML	✓	✓	✓						✓		✓	
		Design and implement 8051 microcontroller based systems.	✓	✓	✓								✓	
		Create dynamic web pages using DHTML and java script that is easy to navigate and use.	✓	✓	✓		✓							✓
		Program server side web pages that have to process request from client side web pages	✓	✓	✓	✓	✓							✓
		Represent web data using XML and develop web pages using JSP	✓	✓	✓	✓	✓				✓		✓	✓
		Understand various web services and how these web services interact.	✓	✓	✓	✓	✓				✓		✓	✓
		Write various applications using C# Language in the .NET Framework.	✓	✓	✓									✓
19150H43P	C# And .Net Framework	Create mobile	✓	✓	✓	✓	✓				✓		✓	

		applications using .NET compact Framework.												
		Develop distributed applications using .NET Framework	✓	✓	✓	✓	✓				✓			✓
19150E44AP	Theory of Computation	Design Finite State Machine, Pushdown Automata, and Turing Machine.	✓	✓	✓	✓								
		Explain the Decidability or Undecidability of various problems	✓	✓	✓	✓	✓							
19150E44BP	Real Time Systems	Explain the basic concepts of real time Operating system design	✓	✓	✓									
		Use the system design techniques to develop software for embedded systems	✓	✓	✓		✓	✓						✓
		Differentiate between the general purpose operating system and the real time operating system	✓	✓	✓	✓	✓	✓						
19150E44CP	User Interface Design	Design Web pages using HTML/XML and style sheets	✓	✓	✓									
		Create user interfaces using Java frames and applets.	✓	✓	✓									✓
		Create dynamic web pages using server side scripting.	✓	✓	✓									✓
		Write Client Server applications.	✓	✓	✓		✓	✓						✓

		Use the frameworks JSP Strut, Hibernate, Spring	✓	✓	✓	✓	✓	✓						✓
19150E44DP	Advanced Databases	design a database using ER diagrams and map ER into Relations and normalize the relations	✓	✓	✓									
		Acquire the knowledge of query evaluation to monitor the performance of the DBMS	✓	✓	✓									
		Acquire the knowledge about different special purpose databases and to critique how they differ from traditional database systems.	✓	✓	✓	✓	✓	✓						
19150L45P	Internet Programming Lab	Create 3D graphical scenes using open graphics library suits	✓	✓	✓									✓
		Implement image manipulation and enhancement	✓	✓	✓	✓	✓			✓				✓
		Create 2D animations using tools	✓	✓	✓	✓	✓			✓		✓	✓	✓
19150H51P	Object Oriented Analysis and	Design and implement projects using OO concepts.	✓	✓	✓	✓				✓				
		Use the UML analysis and design diagrams.	✓	✓	✓	✓	✓			✓		✓	✓	✓
		Apply appropriate design patterns.	✓	✓	✓	✓	✓			✓		✓	✓	✓
		Create code from design.	✓	✓	✓	✓	✓			✓				
		Compare and contrast various testing techniques.	✓	✓	✓	✓	✓			✓		✓	✓	✓

19150H52P	Software Quality Management	Perform functional and nonfunctional tests in the life cycle of the software product	✓	✓	✓						✓			
		Understand system testing and test execution process.	✓	✓	✓	✓	✓				✓		✓	✓
		Identify defect prevention techniques and software quality assurance metrics.	✓	✓	✓	✓	✓				✓		✓	✓
		Apply techniques of quality assurance for typical applications.	✓	✓	✓	✓	✓				✓		✓	✓
19150H53P	Graphics and Multimedia	Gain proficiency in 3D computer graphics API programming	✓	✓	✓	✓	✓							
		Able to understand different realizations of multimedia tools	✓	✓	✓	✓	✓							
		Able to develop interactive animations using multimedia tools	✓	✓	✓	✓	✓							✓
		Gain the knowledge of different media streams in multimedia transmission	✓	✓	✓	✓	✓				✓			✓
		Enhance the perspective of modern computer system with modeling, analysis and interpretation of 2D and 3D visual information.	✓	✓	✓	✓	✓							
19150E54AP	Soft Computing	Apply suitable soft computing techniques for various applications.	✓	✓	✓									

		Integrate various soft computing techniques for complex problems.	✓	✓	✓									
19150E54BP	Principles of Compiler Design	Design and implement a prototype compiler.	✓	✓	✓									
		Apply the various optimization techniques.	✓	✓	✓									
		Use the different compiler construction tools.	✓	✓	✓	✓	✓							
19150E54CP	Distributed Systems	Discuss trends in Distributed Systems.	✓	✓	✓									
		Apply network virtualization.	✓	✓	✓	✓	✓							
		Apply remote method invocation and objects	✓	✓	✓	✓	✓				✓		✓	✓
		Design process and resource management systems.	✓	✓	✓	✓	✓				✓		✓	✓
19150E54DP	Mobile Computing	Explain the basics of mobile telecommunication system	✓	✓	✓									
		Choose the required functionality at each layer for given application	✓	✓	✓									
		Identify solution for each functionality at each layer	✓	✓	✓									✓
		Use simulator tools and design Ad hoc networks	✓	✓	✓	✓	✓							✓
		Develop a mobile application.	✓	✓	✓	✓	✓							✓
19150L55P	Software Development Lab	Design and Implement various mobile	✓	✓	✓								✓	✓

		applications using emulators.												
		Deploy applications to hand-held devices	✓	✓	✓	✓	✓				✓		✓	✓
19150H61P	Embedded Systems	Able to design and control real time control systems	✓	✓	✓									
		Able to understand the functionality of 8085 microprocessor	✓	✓	✓									
		Able incorporate enhanced features in the embedded systems through software	✓	✓	✓	✓	✓							
		Able to rectify minor problems by troubleshooting	✓	✓	✓	✓	✓							
		Acquire the knowledge of real time operating system and implement real time functions	✓	✓	✓	✓	✓							
19150H62P	Advanced Java programming	Develop Java programs using OOP principles	✓	✓	✓									
		Develop Java programs with the concepts inheritance and interfaces	✓	✓	✓	✓	✓							
		Build Java applications using exceptions and I/O streams	✓	✓	✓	✓	✓							
		Develop Java applications with threads and generics classes	✓	✓	✓	✓	✓							
		Develop interactive Java programs using	✓	✓	✓	✓	✓							

		swings												
19150H63P	Software Testing	Design test cases suitable for a software development for different domains.	✓	✓	✓									
		Identify suitable tests to be carried out	✓	✓	✓	✓					✓		✓	✓
		Prepare test planning based on the document.	✓	✓	✓	✓					✓		✓	✓
		Document test plans and test cases designed.	✓	✓	✓	✓	✓				✓		✓	✓
		Use automatic testing tools.	✓	✓	✓	✓	✓				✓		✓	✓
		Develop and validate a test plan.	✓	✓	✓	✓	✓				✓		✓	✓
19160E64AP	Principles of Management	Upon completion of the course, students will be able to have clear understanding of managerial functions like planning, organizing, staffing, leading & controlling and have same basic knowledge on international aspect of management	✓	✓	✓				✓	✓	✓	✓	✓	✓
19150E64BP	Unix Internals	Explain UNIX Operating system and usage of file system.	✓	✓	✓									
		Apply Shell Commands for a given task using filter and pipe commands.	✓	✓	✓	✓	✓							
		Develop and implement the Shell scripts in VI	✓	✓	✓	✓	✓	✓						

		editor.											
		Discuss the various techniques used for optimising the cache performance	✓	✓	✓	✓	✓	✓			✓		✓
		Design hierarchal memory system	✓	✓	✓	✓	✓				✓		✓
19150E64CP	Parallel Computing	optimize sequential code for fastest possible execution	✓	✓	✓								✓
		Develop, analyze and implement algorithms for parallel computers	✓	✓	✓	✓	✓					✓	✓
19150E64DP	Programming paradigms	Identify and discuss the design principles of a given language or paradigms	✓	✓	✓	✓	✓						
		compare different programming languages from the point of view underlying design principles	✓	✓	✓	✓	✓				✓		✓
19150L65P	Java Programming Lab	Create 3D graphical scenes using open graphics library suits	✓	✓	✓	✓	✓						
		Implement image manipulation and enhancement	✓	✓	✓	✓	✓						✓
		Create 2D animations using tools	✓	✓	✓	✓	✓						✓
19160S71P	Total Quality Management	The student would be able to apply the tools and techniques of quality management to manufacturing and services processes.	✓	✓	✓				✓	✓	✓	✓	✓

19150H72P	Grid Computing	Apply grid computing techniques to solve large scale scientific problems.	✓	✓	✓									
		Apply the concept of virtualization.	✓	✓	✓									
		Use the grid and cloud tool kits.	✓	✓	✓		✓							✓
		Apply the security models in the grid and the cloud environment.	✓	✓	✓	✓	✓				✓	✓		✓
19150H73P	Middleware Technologies	To understand how middleware facilitates the development of distributed applications in heterogenous environments	✓	✓	✓									
		to learn the object oriented middleware basics through the example of cobra objects	✓	✓	✓									
		To understand the basics of web services that is the most often used middleare techniques	✓	✓	✓	✓	✓							✓
19150E74AP	High Speed Networks	Will be able to analyze the various parameters of networking	✓	✓	✓	✓								
		Will be able to understand the algorithm and	✓	✓	✓	✓	✓				✓		✓	✓

		technologies involved in internet and associated networks												
19150E74BP	Bio Informatics	Knowledge and awareness of basic principles and concepts of biology, computer science and mathematics	✓	✓	✓				✓		✓		✓	✓
		Existing software effectively to extract information from large databases and to use this information in computer modeling	✓	✓	✓	✓	✓	✓			✓		✓	
19150E74CP	Software Project Management	Identify the key activities in managing a software project.	✓	✓	✓						✓			✓
		Compare different process models.	✓	✓	✓						✓		✓	✓
		Concepts of requirements engineering and Analysis Modeling.	✓	✓	✓						✓		✓	✓
		Apply systematic procedure for software design and deployment.	✓	✓	✓	✓	✓				✓		✓	✓
		Compare and contrast the various testing and maintenance.	✓	✓	✓	✓	✓				✓		✓	✓
19150E74DP	Digital Image Processing	Know and understand the basics and fundamentals of digital image processing, such as digitization, sampling, quantization,	✓	✓	✓									

		and 2Dtransforms.												
		Operate on images using the techniques of smoothing, sharpening and enhancement	✓	✓	✓									
		Understand the restoration concepts and filtering techniques.	✓	✓	✓								✓	
		Learn the basics of segmentation, features extraction, compression and recognition methods for color models	✓	✓	✓	✓	✓						✓	
19150P75P	Project	To independently carry out research /investigation to identify and solve practical problems	✓	✓	✓	✓					✓		✓	✓
		To write and present a report	✓	✓	✓	✓	✓				✓		✓	✓
		To identify the problem in the existing power system and to develop software / hardware solution by doing research.	✓	✓	✓	✓	✓	✓			✓		✓	✓
		To write and present a substantial technical report	✓	✓	✓	✓	✓	✓			✓		✓	✓



COMPUTER SCIENCE AND ENGINEERING

M.TECH (FT)- 2019R

Mapping of COs and POs

Course Code	Title of the Course	Course Objectives	POS											
			PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
19248S11A	Higher Mathematics	Have knowledge of the concepts needed to test the logic of a program	✓		✓	✓								
		Have gained knowledge which has application in expert system, in data base and a basic for the prolog language	✓	✓	✓	✓	✓				✓			
		Have an understanding in identifying patterns on many levels		✓		✓	✓	✓	✓	✓				
19250H12	Modern Operating System	To have an overview of different types of operating systems.	✓		✓									
		To know the components of an operating system.	✓	✓	✓	✓		✓		✓		✓		
		To have a thorough knowledge of process management.	✓	✓	✓	✓		✓		✓	✓			
19250H13	Parallel and High Performance Computing	To understand the models and parameters used.	✓		✓	✓	✓				✓			
		To understand the Matrix Algorithms and Design Issues		✓	✓	✓		✓	✓			✓		
19250H14	Adhoc and Sensor Network	A broad overview of the state of wireless and ad hoc networking.	✓			✓	✓				✓	✓		
		The overview of the physical, networking and architectural issues of		✓	✓		✓		✓	✓				

		ad hoc networks													
19250H15	Advanced Data Structures and Algorithms	The Different Heap Structures, Search Structures and Multimedia Structures.	✓	✓			✓			✓		✓			
		The various coding scheduling and algorithms.	✓	✓	✓		✓								
		The various multimedia structures.	✓		✓	✓	✓	✓	✓		✓	✓			
19250E16 A	Multimedia Systems	To study the graphics techniques and algorithms.	✓	✓	✓		✓								
		To study the multimedia concepts and various I/O technologies				✓	✓		✓		✓	✓			
19250E16B	Genetic Algorithms	Understand and be able to apply fundamental GA theory	✓	✓	✓				✓			✓			
		be able to implement or modify simple genetic algorithms.	✓				✓	✓		✓					
		be able to apply GAs to problems in the student's field.					✓	✓			✓	✓			
19250E16C	Software Metrics	To introduce an integrated approach to software development incorporating quality management methodologies.	✓	✓	✓		✓								
		To study about the quality improvements in software					✓				✓	✓			
		To understand the Software Quality software standards	✓	✓			✓		✓			✓			
19250L17	Advanced Web Technologies Lab	On completion of this course, a student will be familiar with client server architecture and able to develop a web application using java technologies To create fully functional website/web application with MVC architecture	✓	✓	✓	✓	✓	✓	✓						
19250CRS	Research Led Seminar	Exposure to various research domains	✓	✓	✓		✓	✓		✓	✓			✓	
		Acquaintance with languages of research	✓	✓	✓	✓		✓		✓		✓	✓	✓	

		Development of research aptitude	✓	✓		✓						✓	✓	✓	
19250H21	Middleware Technologies	To study the set of services that a middleware system constitutes of.	✓	✓	✓	✓	✓			✓	✓				
		To understand how middleware facilitates the development of distributed applications in heterogeneous environments.	✓	✓			✓	✓		✓	✓	✓			
		To study how it helps to incorporate application portability, distributed application component interoperability and integration.	✓	✓		✓	✓	✓		✓	✓				
19250H22	Object Oriented Software Engineering	To learn about software prototyping, analysis and design.	✓	✓		✓	✓			✓	✓				
		To learn UML and its usage.	✓	✓	✓	✓		✓		✓					
		Case studies to apply the principles													
19250H23	Digital Image Processing	To study the image fundamentals and mathematical transforms necessary for image processing.	✓	✓	✓		✓		✓		✓	✓			
		To study the image enhancement techniques		✓		✓			✓	✓		✓			
		To study image restoration procedures.		✓	✓										
		To study the image compression procedures.	✓		✓	✓									
		To study the image segmentation and representation techniques													
19250E24 A	Advanced Distributed Computing	processing, distributed systems, operating system issues.	✓	✓		✓		✓							
		learn about distributed transaction	✓	✓	✓		✓	✓	✓						
		study about the distributed databases	✓	✓	✓	✓									
19250E24B	Data Warehousing & Data Mining	To introduce the concept of data mining with in detail coverage of basic tasks, metrics, issues, and implication. Core topics like classification,	✓	✓	✓										

		clustering and association rules are exhaustively dealt with.												
		To introduce the concept of data warehousing with special emphasis on architecture and design			✓	✓								
19250E24C	Artificial Neural Networks	To introduce the concepts of artificial neural networks such as biological neural networks, clustering and structures	✓	✓	✓	✓								
		To study the linear models for regression, classification, kernel methods and feed forward neural networks			✓	✓	✓							
19250E25 A	Service Oriented Architecture	Understand SOA, service orientation and web services	✓	✓	✓									
		Analyzing and designing business based on SOA principles.			✓	✓								
		Learning the concepts of XML				✓	✓	✓						
19250E25B	High Speed Networks	Describe and interpret the basics of high speed networking technologies.	✓	✓										
		Apply the concept learnt in this course to optimize and troubleshoot high-speed network.		✓	✓	✓								
		Demonstrate the knowledge of network planning and optimization				✓	✓	✓		✓				
19250E25C	Embedded Systems	To introduce students to the embedded systems, its hardware and software.	✓	✓										
		To introduce devices and buses used for embedded networking.		✓	✓	✓								
		To explain programming concepts and embedded programming in C and C++.			✓	✓	✓	✓	✓	✓				

		To explain real time operating systems, inter-task communication and an exemplary case of MUCOS – IIRTS			✓	✓	✓	✓							
19250L26	.NET Technologies Lab	Create Simple application using web controls	✓	✓	✓	✓	✓				✓	✓	✓	✓	
		Work with States of ASP.NET Pages & Adrotator Control Use of calendar control, Treeview control & Validation controls	✓	✓	✓	✓	✓				✓	✓	✓	✓	
192TECW R	Technical Writing /Seminars	Understand professional writing by studying management communication	✓	✓	✓	✓	✓				✓	✓	✓	✓	
19250CRM	Research Methodology	Understanding research questions and tools	✓	✓	✓	✓	✓		✓						
		Experience in scientific writings	✓	✓	✓	✓	✓	✓	✓						
		Practice in various aspects of scientific publications	✓	✓	✓			✓	✓						
		Inculcation of research ethics	✓	✓		✓	✓			✓		✓			
19250CBR	Participation in Bounded Research	Knowledge and awareness of basic principles and concepts of biology, computer science and mathematics	✓	✓	✓	✓			✓	✓	✓	✓			
19250H31	Software Project Management	Understand Project planning and management.	✓	✓											
		Identify Client management and project definition.		✓	✓										
		Understand testing based approach to development.				✓	✓								
19250E32 A	Cloud Computing	Identify cloud computing models, characteristics, and technologies.	✓	✓											
		Get knowledge about the different architectures in cloud.			✓	✓									
		Identify the information about service management and cloud securities				✓	✓	✓							
19250E32B	Information Security	To understand the basics of Information	✓	✓											

		Security.																	
		To know the legal, ethical and professional issues in Information Security.			✓	✓													
		To become aware of various standards in this area.				✓													
		To know the technological aspects of Information Security.				✓	✓												
19250E32C	Soft Computing	To introduce the ideas of Neural networks, fuzzy logic and use of heuristics base on human experience.	✓	✓															
		To have a general understanding of soft computing methodologies, including artificial neural networks, fuzzy sets, fuzzy logic, fuzzy clustering techniques and genetic algorithms;		✓	✓														
		To Design and development of certain scientific and commercial application using computational neural network models, fuzzy models, fuzzy clustering applications and genetic algorithms in specified applications			✓	✓	✓												
19250E33 A	Advanced Database Technology	Know the operations of parallel and distributed databases.	✓	✓															
		Understand the structure s and standards of object relational databases.		✓	✓	✓													
		Get familiar with the concepts of XML, Mobile and Multimedia Databases			✓	✓	✓												
19250E33B	Mobile Communication and Computing	Learning the basics of Wireless voice and data communications technologies.	✓	✓	✓	✓													
		Enhancing working knowledge on various telephone and satellite networks.			✓	✓	✓												

		Studying the working principles of wireless LAN and its standards.	✓		✓	✓	✓									
		Studying various wireless operating systems				✓	✓									
19250E33C	Green Computing	Understanding scientific and social environment.	✓	✓												
		Minimizing energy consumption from the IT estate.		✓	✓											
		Purchasing green energy and using green suppliers.							✓							
		Reducing the paper and other consumables used.							✓	✓	✓					
		Minimizing equipment disposal requirements														
19250E34 A	Software Quality Assurance	To introduce an integrated approach to software development incorporating quality management methodologies.	✓	✓												
		To study about the quality improvements in software			✓	✓	✓									
		To understand the Software Quality software standards					✓	✓								
19250E34B	Bio-Informatics	Build a solid foundation and acquire the vocabulary you need to supervise or to communicate with others who use these tools.	✓	✓												
		To have ability to design drugs.		✓	✓	✓										
		To understand Evolutionary Trees and Phylogeny.				✓	✓		✓							
		Learn the key methods and tools used in bioinformatics							✓	✓						
19250E34C	Wireless Application Protocols	Be able to discuss current and emerging technology in Wireless technology.	✓	✓	✓											
		Understand fundamental trends of technological evolution of Wireless technology.			✓	✓										

		Have hands-on knowledge in developing simple and comprehensive WAP contents.				✓	✓						
		Be able to create simple Wireless applications					✓						
19250P35	Project Work- Phase I	To independently carry out research /investigation to identify and solve practical problems	✓				✓			✓			✓
		To write and present a report											
19250CSR	Design/Socio Technical Project	To write and present a report	✓			✓			✓				
		To identify the problem in the existing power system and to develop software / hardware solution by doing research.	✓		✓			✓			✓		✓
		To write and present a substantial technical report	✓			✓			✓	✓			✓
19250P41	Project Work- Phase II	To independently carry out research /investigation to identify and solve practical problems			✓	✓						✓	✓
		To write and present a report	✓	✓	✓	✓	✓				✓	✓	✓
		To identify the problem in the existing power system and to develop software / hardware solution by doing research.	✓	✓	✓	✓	✓	✓			✓	✓	✓
		To write and present a substantial technical report	✓	✓	✓	✓	✓	✓			✓	✓	✓



COMPUTER SCIENCE AND ENGINEERING

M.TECH (PT)- 2019R

Mapping of COs and POs

Course Code	Title of the Course	Course Objectives	POS											
			PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
19248S11AP	Higher Mathematics	Have knowledge of the concepts needed to test the logic of a program	✓		✓	✓								
		Have gained knowledge which has application in expert system, in data base and a basic for the prolog language	✓	✓	✓	✓	✓				✓			
		Have an understanding in identifying patterns on many levels		✓		✓	✓	✓	✓	✓				
19250H12P	Adhoc and Sensor Network	A broad overview of the state of wireless and ad hoc networking.	✓			✓	✓				✓	✓		
		The overview of the physical, networking and architectural issues of ad hoc networks		✓	✓		✓		✓	✓				
19250H13P	Advanced Data Structures and Algorithms	The Different Heap Structures, Search Structures and Multimedia Structures.	✓	✓			✓			✓		✓		
		The various coding scheduling and algorithms.	✓	✓	✓		✓							
		The various multimedia structures.	✓	✓	✓	✓	✓	✓	✓		✓	✓		

19250L14P	Advanced Web Technologies Lab	On completion of this course, a student will be familiar with client server architecture and able to develop a web application using java technologies To create fully functional website/web application with MVC architecture	✓	✓	✓	✓	✓	✓	✓					
19250HRSP	Research Led Seminar	Exposure to various research domains	✓	✓	✓		✓	✓		✓	✓			✓
		Acquaintance with languages of research	✓	✓	✓	✓		✓		✓		✓	✓	✓
		Development of research aptitude	✓	✓		✓						✓	✓	✓
19250H21P	Middleware Technologies	To study the set of services that a middleware system constitutes of.	✓	✓	✓	✓	✓			✓	✓			
		To understand how middleware facilitates the development of distributed applications in heterogeneous environments.	✓	✓			✓	✓		✓	✓	✓		
		To study how it helps to incorporate application portability, distributed application component interoperability and integration.	✓	✓		✓	✓	✓		✓	✓			
19250H22P	Digital Image Processing	To study the image fundamentals and mathematical transforms necessary for image processing.	✓	✓	✓		✓		✓		✓	✓		
		To study the image enhancement		✓		✓			✓	✓		✓		

		techniques												
		To study image restoration procedures.		✓	✓									
		To study the image compression procedures.	✓		✓	✓								
		To study the image segmentation and representation techniques												
19250E23AP	Advanced Distributed Computing	processing, distributed systems, operating system issues.	✓	✓		✓		✓						
		learn about distributed transaction	✓	✓	✓		✓	✓	✓					
		study about the distributed databases	✓	✓	✓	✓								
19250E23BP	Data Warehousing & Data Mining	To introduce the concept of data mining with in detail coverage of basic tasks, metrics, issues, and implication. Core topics like classification, clustering and association rules are exhaustively dealt with.	✓	✓	✓									
		To introduce the concept of data warehousing with special emphasis on architecture and design			✓	✓								
19250E23CP	Artificial Neural Networks	To introduce the concepts of artificial neural networks such as biological neural networks, clustering and structures	✓	✓	✓									
		To study the linear models for regression, classification, kernel methods and feed forward neural networks			✓	✓	✓							
19250L24P	.NET Technologies Lab	Create Simple application using web controls	✓	✓	✓	✓	✓				✓	✓	✓	✓
		Work with States of ASP.NET Pages & Adrotator Control Use of calendar control, Treeview control &	✓	✓	✓	✓	✓				✓	✓	✓	✓

		Validation controls												
192TECWRP	Technical Writing /Seminars	Understand professional writing by studying management communication	✓	✓	✓	✓	✓				✓	✓	✓	✓
19250CRMP	Research Methodology	Understanding research questions and tools	✓	✓	✓	✓	✓		✓					
		Experience in scientific writings	✓	✓	✓	✓	✓	✓	✓					
		Inculcation of research ethics	✓	✓		✓	✓			✓		✓		
19250CBRP	Participation in Bounded Research	Knowledge and awareness of basic principles and concepts of biology, computer science and mathematics	✓	✓	✓	✓			✓	✓	✓	✓		
19250H31P	Modern Operating System	To have an overview of different types of operating systems.	✓		✓									
		To know the components of an operating system.	✓	✓	✓	✓		✓		✓		✓		
		To have a thorough knowledge of process management.	✓	✓	✓	✓		✓		✓	✓			
19250E32P	Parallel and High Performance Computing	To understand the models and parameters used.	✓		✓	✓	✓				✓			
		To understand the Matrix Algorithms and Design Issues		✓	✓	✓		✓	✓			✓		
19250E33AP	Multimedia Systems	To study the graphics techniques and algorithms.	✓	✓	✓		✓							
		To study the multimedia concepts and various I/O technologies				✓	✓		✓		✓	✓		
19250E33BP	Genetic Algorithms	Understand and be able to apply fundamental GA theory	✓	✓	✓				✓			✓		
		be able to implement or modify simple genetic algorithms.	✓				✓	✓		✓				
		be able to apply GAs to problems					✓	✓			✓	✓		

		in the student's field.												
19250E33CP	Software Metrics	To introduce an integrated approach to software development incorporating quality management methodologies.	✓	✓	✓		✓							
		To study about the quality improvements in software					✓				✓	✓		
		To understand the Software Quality software standards	✓	✓			✓		✓			✓		
19250CSR	Design/Socio Technical Project	To identify the problem in the existing power system and to develop software / hardware solution by doing research.	✓	✓			✓		✓			✓		
		To write and present a substantial technical report	✓			✓	✓			✓	✓			✓
19250H41P	Object Oriented Software Engineering	To learn about software prototyping, analysis and design.	✓	✓		✓	✓			✓		✓		
		To learn UML and its usage.	✓	✓	✓	✓		✓		✓				
		Case studies to apply the principles												
19250H42P	Software Project Management	Understand Project planning and management.	✓	✓										
		Identify Client management and project definition.		✓	✓									
		Understand testing based approach to development.				✓	✓							
19250E43AP	Service Oriented Architecture	Understand SOA, service orientation and web services	✓	✓	✓									
		Analyzing and designing business based on SOA principles.			✓	✓								
		Learning the concepts of XML				✓	✓	✓						
19250E43BP	High Speed	Describe and interpret the basics of high speed networking	✓	✓										

	Networks	technologies.												
		Apply the concept learnt in this course to optimize and troubleshoot high-speed network.		✓	✓	✓								
		Demonstrate the knowledge of network planning and optimization				✓	✓	✓		✓				
19250E43CP	Embedded Systems	To introduce students to the embedded systems, its hardware and software.	✓	✓										
		To introduce devices and buses used for embedded networking.		✓	✓	✓								
		To explain programming concepts and embedded programming in C and C++.			✓	✓	✓	✓	✓	✓				
		To explain real time operating systems, inter-task communication and an exemplary case of MUCOS – IIRTS			✓	✓	✓	✓						
19250P44P	Project Work-Phase I	To independently carry out research /investigation to identify and solve practical problems	✓				✓		✓				✓	
19250E51AP	Cloud Computing	Identify cloud computing models, characteristics, and technologies.	✓	✓										
		Get knowledge about the different architectures in cloud.			✓	✓								
		Identify the information about service management and cloud securities				✓	✓	✓						
19250E51BP	Information Security	To understand the basics of Information Security.	✓	✓										
		To know the legal, ethical and professional issues in Information Security.			✓	✓								

		To become aware of various standards in this area.				✓									
		To know the technological aspects of Information Security.				✓	✓								
19250E51CP	Soft Computing	To introduce the ideas of Neural networks, fuzzy logic and use of heuristics base on human experience.	✓	✓											
		To have a general understanding of soft computing methodologies, including artificial neural networks, fuzzy sets, fuzzy logic, fuzzy clustering techniques and genetic algorithms;		✓	✓										
		To Design and development of certain scientific and commercial application using computational neural network models, fuzzy models, fuzzy clustering applications and genetic algorithms in specified applications			✓	✓	✓								
19250E52AP	Advanced Database Technology	Know the operations of parallel and distributed databases.	✓	✓											
		Understand the structure s and standards of object relational databases.		✓	✓	✓									
		Get familiar with the concepts of XML, Mobile and Multimedia Databases			✓	✓	✓								
19250E52BP	Mobile Communication and Computing	Learning the basics of Wireless voice and data communications technologies.	✓	✓		✓									
		Enhancing working knowledge on various telephone and satellite networks.			✓	✓	✓								

		Studying the working principles of wireless LAN and its standards.	✓		✓	✓	✓								
		Studying various wireless operating systems				✓	✓								
19250E52CP	Green Computing	Understanding scientific and social environment.	✓	✓											
		Minimizing energy consumption from the IT estate.		✓	✓										
		Purchasing green energy and using green suppliers.							✓						
		Reducing the paper and other consumables used.							✓	✓	✓				
		Minimizing equipment disposal requirements													
17250E53AP	Software Quality Assurance	To introduce an integrated approach to software development incorporating quality management methodologies.	✓	✓											
		To study about the quality improvements in software			✓	✓	✓								
		To understand the Software Quality software standards					✓								
19250E53BP	Bio-Informatics	Build a solid foundation and acquire the vocabulary you need to supervise or to communicate with others who use these tools.	✓	✓											
		To have ability to design drugs.		✓	✓	✓									
		To understand Evolutionary Trees and Phylogeny.				✓	✓		✓						
		Learn the key methods and tools used in bioinformatics							✓	✓					
19250E53CP	Wireless Application	Be able to discuss current and emerging technology in Wireless technology.	✓	✓	✓										

	Protocols	Understand fundamental trends of technological evolution of Wireless technology.			✓	✓									
		Have hands-on knowledge in developing simple and comprehensive WAP contents.				✓	✓								
		Be able to create simple Wireless applications					✓								
19250P61P	Project Work-Phase II	To write and present a report	✓	✓	✓	✓	✓				✓		✓	✓	
		To identify the problem in the existing power system and to develop software / hardware solution by doing research.	✓	✓	✓	✓	✓	✓				✓		✓	✓
		To write and present a substantial technical report	✓	✓	✓	✓	✓	✓				✓		✓	✓

1.1.1 Curricula developed and implemented have relevance to the local, national, regional and global developmental needs which is reflected in Programme outcomes (POs), Programme Specific Outcomes(PSOs) and Course Outcomes(COs) of the Programmes offered by the University (19UGBTGE)

Program Outcomes and Course outcomes of

Department of Biotechnology

REGULATION – 2019

	LOCAL
	REGIONAL
	NATIONAL
	GLOBAL



DEPARTMENT OF BIOTECHNOLOGY

B. Sc - BIOTECHNOLOGY
19UGBTGEC

REGULATION 2019

Programme offered:

S. No	Programme Name	PO and CO
1.	B. Sc Biotechnology	Yes
2.	M. Sc Biotechnology	Yes
3.	M. Phil Biotechnology	Yes

PROGRAMME OUTCOMES	
PO1	Understand the basic concepts, fundamental principles, and the scientific theories related to various scientific phenomena and their relevancies in the day-to-day life
PO2	Understanding and better knowledge of the causes, types and control methods for environmental pollution by the students
PO3	The student will be able to discuss the mechanisms associated with gene expression system in prokaryotes and eukaryotes
PO4	Developed various communication skills such as reading, listening, speaking etc.,
PO5	Acquired the skills in handling scientific instruments, planning and performing in laboratory experiments
PO6	Ethics: Convey and practice social, environmental and biological ethics
PO7	To get knowledge about research tools and learn to do review literature. Ability to carry out independent literature survey corresponding to the specific publications type and asses basic research tool
PROGRAM SPECIFIC OUTCOME	
PS01	Graduates will exhibit contemporary knowledge in Biotechnology and students will be eligible for doing jobs in pharmaceutical and biotechnological Industry.
PS02	An expert in biotechnology and allied fields (medical, microbial, Agricultural, environmental, plant and animal) for utilizing the practical skill to address biotechnological challenges.
PS03	Graduates will be able to work individually as well as in team to survive in multidisciplinary environment.
PS04	If students will engage themselves in the process of effective learning, it will give opportunities to utilize acquired knowledge for the catering the needs of science and technology as well as for the betterment of human mankind.
PS05	Graduates will be able to understand the potentials, and impact of biotechnological innovations on environment and their implementation for finding sustainable solution to issues pertaining to environment, health sector, agriculture, etc.
PROGRAM EDUCATIONAL OBJECTIVES	
PE01	To obtain detailed information about the fundamentals of Biotechnology, allied subjects and life skills
PE02	To provide information about the molecular methods which involved in cellular processes of living systems such as microbes to higher order organisms for applied aspects. To address the emerging need for skilled scientific manpower with research ethics involving organisms
PE03	To impart the basics and current molecular tools in the areas of Molecular Diagnostics,

	Fermentation Technology, Plant, Animal & Environmental Biotechnology are included to train the students for man power development and also sensitize them to scope for research. The practical subjects will provide information about the careers in the industry and applied research where biological system is employed
PEO4	To make the graduates of Biotechnology to learn and to adopt in a competitive world of technology update and contribute to all forms of life
PEO5	To enable them to excute a research objective through experimentation

POs/PEO	P01	P02	P03	P04	P05
PEO1	*	*		*	
PEO2			*	*	*
PEO3		*		*	
PEO4	*	*			*
PEO5			*		

Semester	Course Code	Title of the Course	Cos
I	19110AEC11	Language-I (Tamil-I)	CO1 - Learn the changes that have occurred in literature since the classical period.
			CO2 - Make use of vocabulary systematically.
			CO3 - Understand how to lead one's life realizing the modernity and its environment/atmosphere.
I	19111AEC11	Advanced English-I	CO1 - Develop vocabulary
			CO2 - Learn to edit and do proof reading
			CO3 - Read and comprehend literature
I	19111AEC12	English-I	CO1 - Read and comprehend literature
			CO2 - Appreciate poetry and prose
			CO3 - Familiarize students with fiction.
I	19117AEC13	Fundamentals of Biological system	CO1 - Understand the physical, chemical, and mathematical basis of biology
			CO2 - Appreciate the different scales of biological systems
			CO3 - To understand the Basics in life sciences, evolution and organization of life, living and non-living things
			CO4 - To understand the basics of biomolecules, carbohydrates, proteins, lipids and Nucleic acids
I	19117AEC15L	Fundamentals of Biological system Lab	CO1 - The learners will acquire knowledge on the structure and functions relationship of biological system and as well their roll in various biological process
			CO2 - To know the cellular organization of life, cell theory- cell organization- cell organelles- plant and animal cell

			CO3 - To understanding the basic fundamentals of Biological System
I	19115AEC15A	Biological Chemistry	CO1 - The learners will acquire knowledge on the structure and functions relationship of proteins nucleic acid carbohydrates and as well their roll in various biological process
			CO2 - They study the influence and role of structure in reactivity of biomolecules
			CO3 - Through this course the students are exposed to importance of biological macromolecules
I	19115AEC16AL	Biological Chemistry Lab	CO1 - Students will use current biochemical and molecular techniques to plan and carry out experiments.
			CO2 - Biochemistry Majors will gain proficiency in basic laboratory techniques in both chemistry and biology, and be able to apply the scientific method to the processes of experimentation and hypothesis testing
			CO3 - At the end of the course, the students have a thorough understanding on the role of biomolecules and their functions
I	19120SEC01A	Skill Based Elective-I	CO1 - Recognize when to use each of the Microsoft Office programs to create professional and academic documents.
			CO2 - Use Microsoft Office programs to create personal, academic and business documents following current professional and/or industry standards.
			CO3 - Apply skills and concepts for basic use of computer hardware, software, networks, and the Internet in the workplace and in future coursework as identified by the internationally accepted Internet and Computing Core (IC3) standards.
I	19111SEC01L	Communicative English Lab-I	CO1 - Learn grammar.
			CO2 - Enrich vocabulary
			CO3 - Understand the process of communication
			CO4 - Develop listening skill
I	191INDCONS	Indian Constitution	CO1 - Democratic values and citizenship Training and gained
			CO2 - Awareness on fundamental Rights are established
			CO3 - The functions of union Government and State Government are learnt
			CO4 - The Power and functions of the Judiciary learnt thoroughly
			CO5 - Appreciation of Democratic Parliamentary Rule is learnt
II	19110AEC21	Language-II (Tamil-II)	CO1 - Know what devotion really is.
			CO2 - Know the fruitfulness obtained through devotion
			CO3 - Perceive the progress achieved in the society through devotion.
II	19111AEC21	Advanced English-II	CO1 - Develop technological skills.
			CO2 - Able to write in a variety of formats
			CO3 - Read biographies and develop personality

II	19111AEC22	English-II	CO1 - Appreciate different forms of literature
			CO2 - Acquire language skills through literature
			CO3 - Broadens the horizon of knowledge
II	19117AEC23	Cell Biology and Genetics	CO1 - This paper will enable the students to learn the basics and lay strong foundation in understanding the composition of cells, how cells works is fundamental to living systems.
			CO2 - The course outcome is to train the students in understanding genetics and relate modern DNA technology for disease diagnostics and therapy
			CO3 - Students will be taught Mendelian genetics, their principles and gene interaction.
			CO4 - This gives them a strong foundation on the basic unit of life.
II	19117AEC24L	Cell Biology and Genetics lab	CO1 - Able to isolate the DNA, identify and distinguish different blood cells, to solve simple genetic problems and analyze Human karyotype
			CO2 - The course teaches the students about genes at molecular level
			CO3 - They learn about DNA, RNA and their replication, mutations, DNA repair mechanism
II	19116AEC25	Microbiology	CO1 - This fundamental paper discusses the importance of microorganisms
			CO2 - The course throws light on types of microorganisms in and around humans
			CO3 - At the end of the course, the student has understanding on the metabolism and mechanism of microbial life
			CO4 - Gain knowledge about metabolism.
II	19116AEC26L	Microbiology lab	CO1 - Develop basic skill in aseptic techniques
			CO2 - Understand various accessories for microbiology practicals
			CO3 - Perform various staining techniques
			CO4 - Cultivate bacteria with different cultivation technique
II	19117RLC27	Research LED Seminar	CO1 - Exposure to various research domains
			CO2 - Acquaintance with languages of research
			CO3 - Development of research aptitude
II	19120SEC02A	Skill Based Elective –II	CO1 - Identify the names and functions of the PowerPoint interface.
			CO2 - Create, edit, save, and print presentations.
			CO3 - Format presentations.

			CO4 - Add a graphic to a presentation.
			CO5 - Create and manipulate a simple slideshow with outlines and notes.
			CO6 - Create slide presentations that include text, graphics, animation, and transitions.
II	19111SEC02L	Communicative English Lab-II	CO1 - Learn grammar.
			CO2 - Use a variety of reading strategies
			CO3 - Enhance the skill of making grammatically correct sentences.
III	19110AEC31	Language-III (Tamil-III)	CO1 - Achieve one's goal by following the ancestral path
			CO2 - Learn to lead life of perfection by realizing the uncertainty in the life
			CO3 - Attain happiness through honesty
III	19111AEC31	Advanced English-III	CO1 - Understand phonetics.
			CO2 - Develop writing skill
			CO3 - Able to develop creative writing
III	19111AEC32	English-III	CO1 - Enable to appreciate different types of prose
			CO2 - Develop the conversational skills through one-act plays
			CO3 - Enhance the skill of making grammatically correct sentences.
III	19117AEC33	Plant Physiology	CO1 - Impart an insight into the various plant water relations
			CO2 - Learning about the mineral nutrition in plants
			CO3 - Understand the mechanism of various metabolic processes in plants
			CO4 - Understand the respiration in higher plants with particular emphasis on aerobic and anaerobic respiration.
III	19117AEC34L	Plant physiology Lab	CO1 - Equip students with skills and techniques related to plant physiology so that they can design their own experiments
			CO2 - Learn about the movement of sap and absorption of water in plant body.
			CO3 - Understand the plant movements
III	19117AEC35	Immunology	CO1 - The students may understanding the immune system, its components and various techniques used in bio manipulation.
			CO2 - This course gives an overview on the immune system including organs, cells and receptors
			CO3 - The students learns about molecular basis of antigen recognition, hyper-sensitivity reaction, antigen-antibody reactions
			CO4 - The course develops in the student an appreciation for principles of immunology and its applications in treating human diseases

III	19117AEC36L	Immunology Lab	CO1 - Identify the structure, function, and characteristics of immunoglobulins.
			CO2 - Explain the principles of and perform serological tests.
			CO3 - It's a paper which accomplishes the learning of techniques involved in understanding the immunological aspects of physiology and biological samples
III	19117RMC37	Research Methodology	CO1 - Understanding research questions and tools
			CO2 - Experience in scientific writings
			CO3 - Practice in various aspects of scientific publications
			CO4 - Inculcation of research ethics
III	19120SEC03A	Skill based Elective- III	CO1 - Indicate the names and functions of the Excel interface components.
			CO2 - Enter and edit data.
			CO3 - Format data and cells.
			Construct formulas, including the use of built-in functions, and relative and absolute references.
			CO2 - Create and modify charts.
			CO4 - Preview and print worksheets
III	19111SEC03L	Communicative English Lab-III	CO1 - Learn grammar.
			CO2 - Enhance their fluency in English
			CO3 - Develop speaking and writing skills
			CO4 - Develop individual perspectives that demonstrate critical thinking skills
IV	19110AEC41	Language-IV (Tamil-IV)	CO1 - Realize how the ancient people changed their lifestyle according to the ages
			CO2 - Learn how to change one's lifestyle according to the needs of the future
			CO3 - Accept the modern trends and its uses
IV	19111AEC41	Advanced English-IV	CO1 - Develop writing skill.
			CO2 - Comprehend and describe poems
			CO3 - Learn interviewing skills
IV	19111AEC42	English-IV	CO1 - Improve their ability to read and understand them
			CO2 - Know the genius of Shakespeare
			CO3 - Express in writing their views.

IV	19117AEC43	Animal physiology	<p>CO1 - To provide advanced undergraduate and introductory graduate students with a comprehensive overview of animal physiology from molecular, cellular and whole animal systems approaches.</p> <p>CO2 - To critically evaluate clinical and research case problems relating to endocrinology and cell biology.</p>
IV	19117AEC44L	Animal Physiology Lab	<p>CO1 - Have an enhanced knowledge and appreciation of mammalian physiology</p> <p>CO2 - Understand the functions of important physiological systems including the cardiorespiratory, renal, reproductive and metabolic systems</p> <p>CO3 - It trains the students with essentiality of molecules, cells, tissues and organs involved in the defense mechanism</p>
IV	19117AEC45	Bioinformatics and biostatistics	<p>CO1 - Know the applications and limitations of different bioinformatics and statistical methods.</p> <p>CO2 - Be able to perform and interpret bioinformatics and statistical analyses with real molecular biology data.</p> <p>CO3 - Be able to describe statistical methods and probability distributions relevant for molecular biology data.</p>
IV	19117AEC46L	Bioinformatics and Biostatistics Lab	<p>CO1 - This laboratory course will prepare the students for various applications of bioinformatics in life science research.</p> <p>CO2 - The student will be able to apply basic principles of biology, computer science and mathematics to address complex biological problems</p> <p>CO3 - This course imparts the knowledge of basic statistical methods to solve problems</p>
IV	19120SEC04A	Skill based Elective- IV	<p>CO1 - Examine database concepts and explore the Microsoft Office Access environment.</p> <p>CO2 - Design a simple database.</p> <p>CO3 - Build a new database with related tables.</p> <p>CO4 - Manage the data in a table.</p> <p>CO5 - Query a database using different methods.</p> <p>CO6 - Design a form.</p> <p>CO7 - Generate a report.</p> <p>CO8 - Import and export data.</p>
IV	19111SEC04L	Communicative English Lab-IV	<p>CO1 - Learn grammar.</p> <p>CO2 - Enable to express their views in conversation</p> <p>CO3 - Develop soft skills</p> <p>CO4 - Enhance presentation skills</p>
IV	191ENVTSTU	Environmental Studies	<p>CO1 - Understand ecosystem</p>

			CO2 - Know social issues and the environment
			CO3 - Learn keep the environment eco-friendly
V	19117AEC51	Developmental Biology	CO1 - Be able to list the types of characteristics that make an organism ideal for the study of developmental biology
			CO2 - Be familiar with the events that lead up to and comprise the process of fertilization.
			CO3 - Be able to compare and contrast the process of gastrulation in the various model organisms discussed
V	19117SEC52	Cell and Tissue culture	CO1 - Fundamentals of plant tissue culture. Plant regeneration and organogenesis. Embryogenesis. Organ, anther and pollen culture. Ovary, ovule and embryo culture. Callus suspension culture.
			CO2 - Protoplast, isolation, culture and fusion.
			CO3 - Production of hybrids and cybrids.
V	19117AEC53	Enzyme and enzyme technology	CO1 - The course will provide an overview of the key enzymes currently used in large scale industrial processes
			CO2 - This course includes the isolation, purification and characterization of enzymes and their applications
			CO3 - Discover the current and future trends of applying enzyme technology for the commercialization purpose of biotechnological products.
V	19117AEC54L	Developmental biology, tissue culture lab	CO1 - Demonstrate a basic understanding of developmental terms and mechanisms.
			CO2 - Utilize laboratory techniques to design and carry-out experimental studies.
			CO3 - Conservation of endangered plant species
			CO4 - Molecular, pharmacological and biochemical investigations of different aspects of plant growth and development such as in vitro flowering.
V	19117AEC55L	Enzyme and Enzyme Technology Lab	CO1 - Distinguish the fundamentals of enzyme properties, nomenclatures, characteristics and mechanisms
			CO2 - Apply biochemical calculation for enzyme kinetics
			CO3 - Compare methods for production, purification, characterization and immobilization of enzymes
			CO4 - Discuss various application of enzymes that can benefit human life
V	19117DSC56A	Discipline Specific Elective -I rDNA Technology	CO1 - Utilize the knowledge on creation of a genomic library
			CO2 - Explain the significance of model organisms in recombinant DNA technology
			CO3 - This course teaches rDNA technology techniques and their application in the field of genetic engineering They learn about plasmids, vectors and gain knowledge on the construction of cDNA libraries

V	19117DSC56B	Molecular Biology	CO1 - Understand and apply the principles and techniques of molecular biology which prepares students for further education and/or employment in teaching, basic research, or the health professions
			CO2 - Explain the concept of recombination, linkage mapping and elucidate the gene transfer mechanisms in prokaryotes and eukaryotes
			CO3 - Know the terms and terminologies related to molecular biology and microbial
V	19117BRC57	Participation in Bound- ed Research	CO1 - Hands on exposure to problem solving tools in contemporary research
			CO2 - Evolution of research intuitiveness and orientation
			CO3 - Familiarity with cutting edge research trends
V	19120SEC05A	Skill based Elective- V	CO1 - Work with the Photoshop workspace
			CO2 - Navigate images
			CO3 - Resize and crop images
			CO4 - Make and work with selections
			CO5 - Create new layers and perform other basic layer functions
			CO46- Transform images
V	19111SEC05L	Communicative English Lab-V	CO1 - Develop corporate skills.
			CO2 - Handle their day to day affairs well with their knowledge of language skills.
			CO3 - Get a Job.
VI	19117AEC61	Plant and Animal Bio- technology	CO1 - This course teaches organization and expression of plant and animal genome and plant and animal tissue culture
			CO2 - Students learn about transgenic animal, their application in pharmaceutical industry, cloning and its importance.
			CO3 - This course prepares the students in appreciating the its benefits and applications in biotechnological, pharmaceutical, medical and agricultural field
VI	19117SEC62	Applied Biotechnology	CO1 - Evaluate and describe systems of product research, development, and production
			CO2 - Analyze the potential for commercialization for innovations within the biotechnology industry
			CO3 - The students will gain the basic knowledge of aquaculture and Students will solve a variety of problems using creative thinking skills and analytical skills in the lab.
VI	19117SEC63L	Plant, Animal and Ap- plied Biotechnology Lab	CO1 - The students should have knowledge on biotechnological analysis and the utilization of these knowledge about procedures and utilization of such knowledge to combine biotechnological methods to obtain analytical results

			<p>CO2 - The students will develop fundamental knowledge in Plant Molecular Biotechnology and its application in laboratory and industry settings.</p> <p>CO3 - Describe mechanisms of plant pollination and differentiate between haploid and diploid cells and their role in sexual reproduction</p>
VI	19117AEC64L	Environmental Biotechnology Lab	<p>CO1 - To present an overview of important environmental biotechnologies involved in treatment of pollutants and resource recovery</p> <p>CO2 - The students will be able to demonstrate the use of environmental science principle in solving various environmental problems</p> <p>CO3 - Describe the most commonly applied disinfection methods, and the steps typically involved in drinking water treatment process</p>
VI	19117DSC65A	Discipline Specific Elective - II Environmental Biotechnology	<p>CO1 - Biofuels: Advantages, Energy from biomass, Biogas, Biohydrogen, Biosafety, Toxicity Bio magnification, Threshold Dose, Factor Affecting Toxicity.</p> <p>CO2 - Students will gain about environmental pollutions, preventive measures.</p> <p>CO3 - Explain the microbial processes and growth requirements underlying the activated sludge process, nitrification, denitrification, enhanced phosphorus removal, and anaerobic digestion</p>
VI	19117DSC65B	Environmental Management	<p>CO1 - The students in the course are exposed to the diversity, function, ecological adaptation of microorganisms within the environment</p> <p>CO2 - This course gives the importance of microbial life to key ecosystem process and teaches the role of biotechnology to address environmental issues</p>
VI	19117PRW67	Project Work	<p>CO1 - Understand basic concepts of research and its methodologies</p> <p>CO2 - Identify appropriate research problem and parameters</p> <p>CO3 - Prepare a research report</p>
VI	19120SEC06A	Skill Based Elective – VI	<p>CO1 - Learn to create animated graphics, add sound and interactivity.</p> <p>CO2 - Can develop Website</p> <p>CO3 - CD based presentations</p>
VI	19111SEC06L	Communicative English Lab-VI	<p>CO1 - Apply study skills</p> <p>CO2 - Widen creative thinking</p> <p>CO3 - Be a good team worker</p> <p>CO4 - Make them proficient in English</p>



PRIST
DEEMED TO BE
UNIVERSITY
NAAC ACCREDITED
THANJAVUR – 613 403 - TAMILNADU

DEPARTMENT OF BIOTECHNOLOGY

M. Sc - BIOTECHNOLOGY
19PGBTGEC

PROGRAMME OUTCOMES	
PO1	Vital Thinking: Acquire knowledgeable actions after identifying the hypothesis that frame our idea and dealings, read-through out the degree to which these hypothesis are precise and suitable, and give the impression of being at our thoughts and assessments (academic, organizational and individual) from diverse perception.
PO2	Precious communication: Study about speak, read, write and listen noticeably in person and throughout electronic media in English and in one Indian language

	and build meaning of the globe by connecting people, thoughts books, media and technology.
PO3	Effectual citizenship: Reveal empathetic social concern and fairnesscentred national progress and the capability to act with andtake part in civic life through volunteering
PO4	Ethics: Be aware of diverse value systems including the individual, under the ethical dimensions of personal choice, and believe responsibility for them.
PO5	Environment and Sustainability: Analyze the importance of microbes for environmental clean-up and sustainable development.
PO6	Self-directed and life-long learning: To gain the talent to employ in self-determining and life-long learning in the broadest circumstance socio technological transforms.
PROGRAM SPECIFIC OUTCOME	
PSO1	Upon master graduation, Microbiology majors will master a set of advanced skills, which would be useful to function effectively as professionals and to their continued development and learning within the field of Microbiology.
PSO2	Able to explain why microorganisms are ubiquitous in nature, inhabiting a multitude of habitats and occupying a wide range of ecological habitats.
PSO3	Able to cite examples of the vital role of microorganisms in biotechnology, fermentation, medicine and other industries important to human well-being.
PSO4	Able to demonstrate that microorganisms have an indispensable role in the environment, including elemental cycles, biodegradation etc
PSO5	Able to systematically collect record and analyze data, identify sources of error, interpret the result and reach logical conclusion.
PROGRAM EDUCATIONAL OBJECTIVES	
PEO1	To provide detailed knowledge of Microbiology and their application fields. To understand the beneficial and harmful role of microorganisms in the environment and in the industries.
PEO2	To understand the fundamentals of physiological reactions including metabolic pathways and biochemical reactions in microorganisms. To understand the fundamental concepts of immunology, biochemistry, biotechnology and genetics etc.
PEO3	To develop human resource and entrepreneurs in microbiology with the ability to independently start their own ventures or small biotech units in the field of biotechnology.
PEO4	Understand modern microbiology - practices and approaches with an emphasis in technology application in pharmaceutical, medical, industrial, environmental and agricultural areas.
PEO5	Gain experience with standard molecular tools and approaches utilized: manipulate genes, gene products and organisms. Become familiar with handling of Laboratory animals for the research purpose. Interpret differences in data distributions via visual displays.

**MAPPING OF PEO AND PO
M.Sc., CURRICULUM MAPPING
PROGRAMME EDUCATIONAL OBJECTIVES VS PROGRAMME OURCOME**

POs/PEO	PO1	PO2	PO3	PO4	PO5
PEO1	*	*	*	*	
PEO2	*			*	*
PEO3		*		*	
PEO4	*	*			*
PEO5	*		*		

Semester	Course Code	Title of the Course	COs
I	19217AEC11	General Microbiology	CO1 - Students can gain the idea of how to identify the microorganisms based on the modern polyphasic approach.
	19217AEC12	Molecular genetics	CO1 - After successful completion of the paper the students will get an overall view about genetic makeup of organisms and can take up a career in research.
	19217AEC13	Biochemistry	CO1 - This paper in biochemistry has been designed to provide the student with a firm foundation in the biochemical aspects of cellular functions which forms a base for their future research.
	19217SEC14L	Microbiology & Molecular Genetics Lab	CO1 - After successful completion of the paper the students will get an overall view about genetic makeup of organisms and can take up a career in research.
	19217DSC15A	Immunology	CO1 - This course will provide the student insights into the various aspects of Immunology such as classical immunology, clinical immunology, Immunotherapy and diagnostic immunology.
	19217DSC15B	Biosafety and Biodiversity	CO1 - To study the diversity of plants and animal life in a particular habitat, ethical issues and potential of biotechnology for the benefit of man kind
	19217RLS16	Research Led Seminar	CO1 - Exposure to various research domains
CO2 - Acquaintance with languages of research			
CO3 - Development of research aptitude			
II	19217AEC21	Cell & Molecular Biology	CO1 - Students after completion of this paper will be exceptionally well prepared to pursue careers in cellular and sub cellular biological research, biomedical research, or medicine or allied health fields.

	19217AEC22	Biophysics & Bioinformatics	CO2 - This paper has been designed to give the students comprehensive training in the emerging and exciting upcoming field of Systems Biology, which will help students to get career in both industry/R&D.
	19217AEC23	Industrial Biotechnology	CO1 - This course is important in the era of industrialization leading to environmental hazards and hence will help students to take up a career in tackling industrial pollution and also to take up the research in areas like development of biological systems for remediation of contaminated environments (land, air, water), and for environment-friendly processes such as green manufacturing technologies and sustainable development.
	19217SEC24L	Molecular Biology & Industrial Biotechnology Lab	CO1 - Students after completion of this paper will be exceptionally well prepared to pursue careers in cellular and sub cellular biological research, biomedical research, or medicine or allied health fields
	19217DSC25A	Endocrinology	CO1 -To know the pathophysiological significance of the system with special reference to humans.
	19217DSC25B	Intellectual Property Rights	CO1 - To get registration in our country and foreign countries of their invention, designs and thesis or theory written by the students during their project work and for this they must have knowledge of patents, copy right, trademarks, designs and information Technology Act. Further teacher will have to demonstrate with products and ask the student to identify the different types of IPR'
	19217RMC26	Research Methodology	CO1 - Understanding research questions and tools
CO2 - Experience in scientific writings			
CO3 - Practice in various aspects of scientific publications			
CO4 - Inculcation of research ethics			
	19217BRC27	Participation in Bounded Research	CO1 - Hands on exposure to problem solving tools in contemporary research
CO2 - Evolution of research intuitiveness and orientation			
CO3 - Familiarity with cutting edge research trends			
III	19217AEC31	Genomics	CO1 - Acquire the aspects of Gene Contig and Shotgun method.
			CO2 - Know the features of the Genome Mapping databases.
	19217AEC32	Proteomics	CO1 - Gain knowledge on phylogenetic profiles
			CO2 - Describe the features of Yeast two-hybrid system.

	19217SEC33L	Genomics & Proteomics - Lab	CO1 - This paper will help students interested in careers as laboratory, research or animal care technicians in the fields of veterinary and human health or biotechnology.
	19217DSC34A	Discipline specific elective III Nanobiotechnology	CO1 - This course will act as a bridge between students from non-biology course at all levels
	19217DSC34B	Discipline specific elective III Environmental biotechnology	CO1 - This course is important in the era of industrialization leading to environmental hazards and hence will help students to take up a career in tackling industrial pollution and also who is willing to take up the research in areas like development of biological systems for remediation of contaminated environments (land, air, water), and for environment-friendly processes such as green manufacturing technologies and sustainable development
IV	19217AEC41	Food Technology	CO1 - To understand the basic food safety issues in the food market
			CO2 - To develop and evaluate quality of new food products using objective and subjective methodologies.
			CO3 - To understand the basic concepts in food chemistry and food analysis
	19217AEC42	Bio instrumentation	CO1 - Check for analytical functions and find the analytical function and study
			CO2 - Learn the measurement systems, errors of measurement
			CO3 - Demonstrate basic knowledge of Biotechniques
	19217SEC43L	Food technology and Bio instrumentation lab	CO1 - Ability to apply principles of food engineering in industry.
			CO2 - Understand, identify and analyze a problem related to food industry and ability to find an appropriate solution for the same.
	19217DSC44A	Gene therapy utilization pharmacology	CO1 - Understand some of the types of disease that might be treatable by gene therapy
			CO2 - Understand the basic principles of genetic manipulation
			CO3 - Understand how genetics may be used in the design of drugs
	19217DSC44B	Plant conservation & disaster management	CO1 - To make sustainable utilization of species and ecosystems
CO2 - Familiarity with disaster management theory (cycle, phases) Knowledge about existing global frameworks and existing agreements (e.g. Sendai)			
CO3 - Regulatory practices, biosensors and applications in Pharmaceuticals			
CO4 - Quality Assurance and Validation			

19217PRW45	Project work	CO1 - Experience from a master's project and international literature.
		CO2 - Develop ability to independently carry out a complete scientific process.
		CO3 - Learn about how to write dissertations and proposals for the scientific community.



PRIST
DEEMED TO BE
UNIVERSITY
NAAC ACCREDITED
THANJAVUR – 613 403 - TAMILNADU

School of Arts and Science
Department of Biotechnology
19MPBTGE
2019 Regulation
Program Outcomes and Course outcomes of
M. Phil., Mapping of COs and POs

Semester	Course Code	Title of the Course	COs
I	193BTC12	Advanced Biotechnology	Understanding research questions and tools
			Experience in scientific writings
			Practice in various aspects of scientific publications
			Inculcation of research ethics
	193BTE13	Environmental Bio-	Develop and demonstrate the advanced genetic engineering and cloning techniques

		technology	Explain the elaborate details of plant biotechnology like vector for gene transfer, Binary vector
			Demonstrate the advanced fermentation techniques and conventional fermentation versus biotransformation.



PRIST
DEEMED TO BE
UNIVERSITY
NAAC ACCREDITED
THANJAVUR – 613 403 - TAMILNADU

School of Arts and Science
Department of Biotechnology
19UGMBTGEC
2019 Regulation
Program Outcomes and Course outcomes of
B.Sc., Mapping of COs and POs

Semester	Course Code	Title of the Course	Cos	POS						
				PO1	PO2	PO3	PO4	PO5	PO6	PO7
I	19110AEC11	Language-I (Tamil-I)	CO1 - Learn the changes that have occurred in literature since the classical period.	*		*	*	*		*
			CO2 - Make use of vocabulary systematically	*	*	*		*	*	*
			CO3 - Understand how to lead one's life realizing the modernity and its environment/atmosphere	*	*	*		*	*	*
I	19111AEC11	Advanced English-I	CO1 - Develop vocabulary	*	*	*		*	*	*
			CO2 - Learn to edit and do proof reading	*	*		*	*		*
			CO3 - Read and comprehend literature	*	*	*		*	*	*
I	19111AEC12	English-I	CO1 - Read and comprehend literature	*	*	*	*		*	*
			CO2 - Appreciate poetry and prose	*		*	*	*	*	*

			CO3 - Familiarize students with fiction.		*	*	*	*		*
I	19117AEC13	Fundamentals of Biological system	CO1 - Understand the physical, chemical, and mathematical basis of biology	*		*	*	*		*
			CO2 - Appreciate the different scales of biological systems	*	*		*	*	*	*
			CO3 - To understand the Basics in life sciences, evolution and organization of life, living and non-living things	*	*	*	*	*	*	*
			CO4 - To understand the basics of biomolecules, carbohydrates, proteins, lipids and Nucleic acids	*	*	*	*	*	*	*
I	19117AEC15L	Fundamentals of Biological system Lab	CO1 - The learners will acquire knowledge on the structure and functions relationship of biological system and as well their roll in various biological process	*	*	*	*		*	*
			CO2 - To know the cellular organization of life, cell theory-cell organization-cell organelles- plant and animal cell	*	*	*	*	*	*	*
			CO3 - To understanding the basic fundamentals of Biological System	*	*	*	*	*	*	*
I	19115AEC15A	Biological Chemistry	CO1 - The learners will acquire knowledge on the structure and functions relationship of proteins nucleic acid carbohydrates and as well their roll in various biological process	*	*	*		*	*	*
			CO2 - They study the influence and role of structure in reactivity of biomolecules	*	*	*	*	*	*	*
			CO3 - Through this course the students are exposed to importance of biological macromolecules	*	*	*	*	*	*	*

I	19115AEC16AL	Biological Chemistry Lab	CO1 - Students will use current biochemical and molecular techniques to plan and carry out experiments.	*	*		*	*	*	*
			CO2 - Biochemistry Majors will gain proficiency in basic laboratory techniques in both chemistry and biology, and be able to apply the scientific method to the processes of experimentation and hypothesis testing	*		*	*	*	*	*
			CO3 - At the end of the course, the students have a thorough understanding on the role of biomolecules and their functions	*	*	*	*	*	*	*
I	19120SEC01A	Skill Based Elective-I	CO1 - Recognize when to use each of the Microsoft Office programs to create professional and academic documents.	*	*	*		*	*	
			CO2 - Use Microsoft Office programs to create personal, academic and business documents following current professional and/or industry standards.	*	*		*	*	*	*
			CO3 - Apply skills and concepts for basic use of computer hardware, software, networks, and the Internet in the workplace and in future coursework as identified by the internationally accepted Internet and Computing Core (IC3) standards.	*		*	*	*	*	*
I	19111SEC01L	Communicative English Lab-I	CO1 - Learn grammar.	*	*	*		*	*	*
			CO2 - Enrich vocabulary	*		*	*	*		*
			CO3 - Understand the process of communication	*	*		*		*	*
			CO4 - Develop listening skill	*	*		*		*	*
I	191INDCONS	Indian Constitution	CO1 - Democratic values and citizenship Training and gained	*	*	*		*	*	*
			CO2 - Awareness on fundamental Rights are established	*	*	*	*	*	*	*

			CO3 - The functions of union Government and State Government are learnt	*	*	*	*	*	*	*
			CO4 - The Power and functions of the Judiciary learnt thoroughly	*	*		*	*	*	*
			CO5 - Appreciation of Democratic Parliamentary Rule is learnt	*	*		*	*	*	
II	19110AEC21	Language-II (Tamil-II)	CO1 - Know what devotion really is.	*	*		*	*	*	*
			CO2 - Know the fruitfulness obtained through devotion	*	*	*		*	*	*
			CO3 - Perceive the progress achieved in the society through devotion.	*	*		*	*	*	*
II	19111AEC21	Advanced English-II	CO1 - Develop technological skills.	*	*		*	*	*	*
			CO2 - Able to write in a variety of formats	*	*	*	*		*	*
			CO3 - Read biographies and develop personality	*	*	*	*		*	*
II	19111AEC22	English-II	CO1 - Appreciate different forms of literature	*		*	*	*	*	*
			CO2 - Acquire language skills through literature	*	*	*	*		*	*
			CO3 - Broadens the horizon of knowledge	*	*	*	*		*	*
II	19117AEC23	Cell Biology and Genetics	CO1 - This paper will enable the students to learn the basics and lay strong foundation in understanding the composition of cells, how cells works is fundamental to living systems.	*	*	*	*		*	*
			CO2 - The course outcome is to train the students in understanding genetics and relate modern DNA technology for disease diagnostics and therapy	*	*	*		*	*	*

			CO3 - Students will be taught Mendelian genetics, their principles and gene interaction.	*	*	*		*	*	*
			CO4 - This gives them a strong foundation on the basic unit of life.	*	*	*	*	*	*	*
II	19117AEC24L	Cell Biology and Genetics lab	CO1 - Able to isolate the DNA, identify and distinguish different blood cells, to solve simple genetic problems and analyze Human karyotype	*	*	*	*	*	*	*
			CO2 - The course teaches the students about genes at molecular level	*	*	*		*	*	*
			CO3 - They learn about DNA, RNA and their replication, mutations, DNA repair mechanism	*	*	*	*	*		*
II	19116AEC25	Microbiology	CO1 - This fundamental paper discusses the importance of microorganisms	*	*	*		*	*	*
			CO2 - The course throws light on types of microorganisms in and around humans	*	*		*	*	*	*
			CO3 - At the end of the course, the student has understanding on the metabolism and mechanism of microbial life	*	*		*	*	*	*
			CO4 - Gain knowledge about metabolism.	*	*		*	*	*	*
II	19116AEC26L	Microbiology lab	CO1 - Develop basic skill in aseptic techniques	*	*	*		*	*	*
			CO2 - Understand various accessories for microbiology practical's	*	*		*	*	*	*
			CO3 - Perform various staining techniques	*	*	*		*	*	*

			CO4 - Cultivate bacteria with different cultivation technique	*	*		*	*	*	*
II	19117RLC27	Research LED Seminar	CO1 - Exposure to various research domains	*	*	*		*	*	*
			CO2 - Acquaintance with languages of research	*		*	*	*	*	*
			CO3 - Development of research aptitude	*	*	*		*	*	*
II	19120SEC02A	Skill Based Elective – II	CO1 - Identify the names and functions of the PowerPoint interface.	*	*		*	*	*	*
			CO2 - Create, edit, save, and print presentations.	*	*	*		*		*
			CO3 - Format presentations.	*	*		*	*	*	*
			CO4 - Add a graphic to a presentation.	*	*	*	*		*	*
			CO5 - Create and manipulate a simple slideshow with outlines and notes.	*	*	*		*	*	*
			CO6 - Create slide presentations that include text, graphics, animation, and transitions.	*	*	*	*		*	*
II	19111SEC02L	Communicative English Lab-II	CO1 - Learn grammar.	*	*	*	*		*	*
			CO2 - Use a variety of reading strategies	*	*		*	*	*	*
			CO3 - Enhance the skill of making grammatically correct sentences.	*	*	*	*	*		*
III	19110AEC31	Language-III (Tamil-III)	CO1 - Achieve one's goal by following the ancestral path	*	*	*		*	*	*
			CO2 - Learn to lead life of perfection by realizing the uncertainty in the life	*	*	*	*	*		*

			CO3 - Attain happiness through honesty	*	*	*	*		*	*
III	19111AEC31	Advanced English-III	CO1 - Understand phonetics.	*	*		*	*	*	*
			CO2 - Develop writing skill	*	*	*	*		*	*
			CO3 - Able to develop creative writing	*	*	*		*	*	*
III	19111AEC32	English-III	CO1 - Enable to appreciate different types of prose	*	*		*	*	*	*
			CO2 - Develop the conversational skills through one-act plays	*		*	*	*	*	*
			CO3 - Enhance the skill of making grammatically correct sentences.	*	*	*	*		*	*
III	19117AEC33	Plant Physiology	CO1 - Impart an insight into the various plant water relations		*	*	*	*	*	*
			CO2 - Learning about the mineral nutrition in plants	*		*	*	*	*	*
			CO3 - Understand the mechanism of various metabolic processes in plants	*	*	*		*	*	*
			CO4 - Understand the respiration in higher plants with particular emphasis on aerobic and anaerobic respiration.	*		*	*	*	*	*
III	19117AEC34L	Plant physiology Lab	CO1 - Equip students with skills and techniques related to plant physiology so that they can design their own experiments	*	*	*	*	*	*	*
			CO2 - Learn about the movement of sap and absorption of water in plant body.	*	*	*		*	*	*

			CO3 - Understand the plant movements	*	*	*	*	*	*	*	
III	19117AEC35	Immunology	CO1 - The students may understand the immune system, its components and various techniques used in bio manipulation.	*	*	*	*	*	*	*	
			CO2 - This course gives an overview on the immune system including organs, cells and receptors	*	*	*	*	*		*	
			CO3 - The students learns about molecular basis of antigen recognition, hypersensitivity reaction, antigen-antibody reactions	*		*	*	*	*	*	*
			CO4 - The course develops in the student an appreciation for principles of immunology and its applications in treating human diseases	*	*	*		*	*	*	
III	19117AEC36L	Immunology Lab	CO1 - Identify the structure, function, and characteristics of immunoglobulins.	*	*		*	*	*	*	
			CO2 - Explain the principles of and perform serological tests.	*	*	*	*	*		*	
			CO3 - It's a paper which accomplishes the learning of techniques involved in understanding the immunological aspects of physiology and biological samples	*	*		*	*	*	*	
III	19117RMC37	Research Methodology	CO1 - Understanding research questions and tools	*	*	*	*	*	*	*	
			CO2 - Experience in scientific writings	*	*	*	*		*	*	
			CO3 - Practice in various aspects of scientific publications	*		*	*	*	*	*	
			CO4 - Inculcation of research ethics	*	*	*		*	*	*	

III	19120SEC03A	Skill based Elective-III	CO1 - Indicate the names and functions of the Excel interface components.	*	*	*		*	*	*
			CO2 - Enter and edit data.	*	*	*	*		*	*
			CO3 - Format data and cells.	*	*		*	*	*	*
			CO4 - Construct formulas, including the use of built-in functions, and relative and absolute references.	*	*	*	*	*		*
			CO5 - Create and modify charts.	*	*		*	*	*	*
			CO6 - Preview and print worksheets	*	*	*		*	*	*
III	19111SEC03L	Communicative English Lab-III	CO1 - Learn grammar.	*	*		*	*	*	*
			CO2 - Enhance their fluency in English	*		*	*	*	*	*
			CO3 - Develop speaking and writing skills	*	*	*	*		*	*
			CO4 - Develop individual perspectives that demonstrate critical thinking skills	*		*	*		*	*
IV	19110AEC41	Language-IV (Tamil-IV)	CO1 - Realize how the ancient people changed their lifestyle according to the ages	*	*		*	*	*	
			CO2 - Learn how to change one's lifestyle according to the needs of the future	*	*		*	*	*	*
			CO3 - Accept the modern trends and its uses	*	*		*	*	*	*
IV	19111AEC41	Advanced English-IV	CO1 - Develop writing skill.	*		*	*	*	*	*
			CO2 - Comprehend and describe poems	*	*	*	*		*	*

			CO3 - Learn interviewing skills	*	*		*	*	*	*
IV	19111AEC42	English-IV	CO1 - Improve their ability to read and understand them	*	*		*	*	*	*
			CO2 - Know the genius of Shakespeare	*	*		*		*	*
			CO3 - Express in writing their views.	*	*	*	*	*		*
IV	19117AEC43	Animal physiology	CO1 - To provide advanced undergraduate and introductory graduate students with a comprehensive overview of animal physiology from molecular, cellular and whole animal systems approaches.	*		*	*		*	
			CO2 - To critically evaluate clinical and research case problems relating to endocrinology and cell biology.	*	*	*	*	*		*
IV	19117AEC44L	Animal Physiology Lab	CO1 - Have an enhanced knowledge and appreciation of mammalian physiology	*	*	*	*	*		*
			CO2 - Understand the functions of important physiological systems including the cardiorespiratory, renal, reproductive and metabolic systems	*	*	*	*		*	*
			CO3 - It trains the students with essentiality of molecules, cells, tissues and organs involved in the defense mechanism	*	*	*	*	*	*	*
IV	19117AEC45	Bioinformatics and biostatistics	CO1 - Know the applications and limitations of different bioinformatics and statistical methods.	*	*	*	*	*	*	*
			CO2 - Be able to perform and interpret bioinformatics and statistical analyses with real molecular biology data.	*	*	*	*		*	*

			CO3 - Be able to describe statistical methods and probability distributions relevant for molecular biology data.	*	*		*	*	*	*
IV	19117AEC46L	Bioinformatics and Biostatistics Lab	CO1 - This laboratory course will prepare the students for various applications of bioinformatics in life science research.	*	*	*	*	*	*	*
			CO2 - The student will be able to apply basic principles of biology, computer science and mathematics to address complex biological problems	*	*	*	*		*	*
			CO3 - This course imparts the knowledge of basic statistical methods to solve problems	*	*		*	*	*	*
IV	19120SEC04A	Skill based Elective-IV	CO1 - Examine database concepts and explore the Microsoft Office Access environment.	*	*		*	*		*
			CO2 - Design a simple database.	*	*	*		*	*	*
			CO3 - Build a new database with related tables.	*	*	*	*	*	*	*
			CO4 - Manage the data in a table.	*	*	*	*	*	*	*
			CO5 - Query a database using different methods.	*	*		*	*	*	*
			CO6 - Design a form.	*		*	*		*	*
			CO7 - Generate a report.	*	*	*		*		*
			CO8 - Import and export data.		*		*	*	*	*
IV	19111SEC04L	Communicative	CO1 - Learn grammar	*	*		*	*		*

		English Lab-IV	CO2 - Enable to express their views in conversation		*	*	*		*	*
			CO3 - Develop soft skills	*		*	*	*	*	*
			CO4 - Enhance presentation skills	*	*		*	*	*	*
IV	191ENVTSTU	Environmental Studies	CO1 - Understand ecosystem	*		*	*	*		*
			CO2 - Know social issues and the environment	*	*		*	*	*	*
			CO3 - Learn keep the environment eco-friendly	*	*	*	*		*	*
V	19117AEC51	Developmental Biology	CO1 - Be able to list the types of characteristics that make an organism ideal for the study of developmental biology	*	*		*	*		*
			CO2 - Be familiar with the events that lead up to and comprise the process of fertilization.	*	*		*	*	*	*
			CO3 - Be able to compare and contrast the process of gastrulation in the various model organisms discussed	*	*	*		*	*	*
V	19117SEC52	Cell and Tissue culture	CO1 - Fundamentals of plant tissue culture. Plant regeneration and organogenesis. Embryogenesis. Organ, anther and pollen culture. Ovary, ovule and embryo culture. Callus suspension culture.	*	*	*		*	*	*
			CO2 - Protoplast, isolation, culture and fusion.	*	*	*		*	*	*
			CO3 - Production of hybrids and cybrids.	*	*	*	*	*		*
V	19117AEC53	Enzyme and enzyme technology	CO1 - The course will provide an overview of the key enzymes currently used in large scale industrial processes	*	*	*		*	*	*

			CO2 - This course includes the isolation, purification and characterization of enzymes and their applications	*	*		*	*	*	*
			CO3 - Discover the current and future trends of applying enzyme technology for the commercialization purpose of biotechnological products.	*		*	*	*	*	*
V	19117AEC54L	Developmental biology, tissue culture lab	CO1 - Demonstrate a basic understanding of developmental terms and mechanisms.	*		*	*	*	*	*
			CO2 - Utilize laboratory techniques to design and carry-out experimental studies.	*	*		*	*	*	*
			CO3 - Conservation of endangered plant species	*	*		*	*	*	*
			CO4 - Molecular, pharmacological and biochemical investigations of different aspects of plant growth and development such as in vitro flowering.	*	*	*	*	*	*	*
V	19117AEC55L	Enzyme and Enzyme Technology Lab	CO1 - Distinguish the fundamentals of enzyme properties, nomenclatures, characteristics and mechanisms	*	*		*	*	*	*
			CO2 - Apply biochemical calculation for enzyme kinetics	*	*	*		*	*	*
			CO3 - Compare methods for production, purification, characterization and immobilization of enzymes	*		*	*		*	*
			CO4 - Discuss various application of enzymes that can benefit human life	*	*	*	*	*		*
V	19117DSC56A	Discipline Specific Elective -I rDNA Technology	CO1 - Utilize the knowledge on creation of a genomic library	*	*	*		*	*	*
			CO2 - Explain the significance of model organisms in recombinant DNA technology	*		*	*	*	*	*

			CO1 - This course teaches rDNA technology techniques and their application in the field of genetic engineering They learn about plasmids, vectors and gain knowledge on the construction of cDNA libraries	*	*	*		*	*	*
V	19117DSC56B	Molecular Biology	CO1 - Understand and apply the principles and techniques of molecular biology which prepares students for further education and/or employment in teaching, basic research or the health professions	*	*	*		*	*	*
			CO2 - Explain the concept of recombination, linkage mapping and elucidate the gene transfer mechanisms in prokaryotes and eukaryotes	*	*	*	*	*		*
			CO3 - Know the terms and terminologies related to molecular biology and microbial	*	*	*	*	*		*
V	19117BRC57	Participation in Bounded Research	CO1 - Hands on exposure to problem solving tools in contemporary research	*	*	*	*	*	*	*
			CO2 - Evolution of research intuitiveness and orientation	*	*	*		*	*	*
			CO3 - Familiarity with cutting edge research trends	*	*	*	*	*	*	*
V	19120SEC05A	Skill based Elective-V	CO1 - Work with the Photoshop workspace	*	*	*	*	*	*	*
			CO2 - Navigate images	*	*	*		*	*	*
			CO3 - Resize and crop images	*	*	*	*	*	*	*
			CO4 - Make and work with selections	*	*	*		*	*	*
			CO5 - Create new layers and perform other basic layer functions	*	*	*	*	*		*

			CO6 - Transform images	*		*	*	*	*	*
V	19111SEC05L	Communicative English Lab-V	CO1 - Develop corporate skills.	*	*		*	*	*	*
			CO2 - Handle their day to day affairs well with their knowledge of language skills.	*	*	*	*	*		*
			CO3 - Get a Job.	*	*		*	*	*	*
VI	19117AEC61	Plant and Animal Biotechnology	CO1 - This course teaches organization and expression of plant and animal genome and plant and animal tissue culture	*	*	*	*		*	*
			CO2 - Students learn about transgenic animal, their application in pharmaceutical industry, cloning and its importance.	*	*		*	*	*	*
			CO3 - This course prepares the students in appreciating the its benefits and applications in biotechnological, pharmaceutical, medical and agricultural field	*	*	*	*	*		*
VI	19117SEC62	Applied Biotechnology	CO1 - Evaluate and describe systems of product research, development, and production	*	*	*	*		*	*
			CO2 - Analyze the potential for commercialization for innovations within the biotechnology industry	*	*		*	*		*
			CO3 - The students will gain the basic knowledge of aquaculture and Students will solve a variety of problems using creative thinking skills and analytical skills in the lab.	*	*	*		*	*	*
VI	19117SEC63L	Plant, Animal and Applied Biotechnology Lab	CO1 - The students should have knowledge on biotechnological analysis and the utilization of these knowledge about procedures and utilization of such knowledge to combine biotechnological methods to obtain analytical results	*	*	*		*	*	*

			CO2 - The students will develop fundamental knowledge in Plant Molecular Biotechnology and its application in laboratory and industry settings.	*	*	*	*	*		*
			CO3 - Describe mechanisms of plant pollination and differentiate between haploid and diploid cells and their role in sexual reproduction	*	*	*	*		*	*
VI	19117AEC64L	Environmental Biotechnology Lab	CO1 - To present an overview of important environmental biotechnologies involved in treatment of pollutants and resource recovery	*		*	*	*	*	*
			CO2 - The students will be able to demonstrate the use of environmental science principle in solving various environmental problems	*	*	*	*	*	*	*
			CO3 - Describe the most commonly applied disinfection methods, and the steps typically involved in drinking water treatment process	*	*	*		*	*	*
VI	19117DSC65A	Discipline Specific Elective - II Environmental Biotechnology	CO1 - Biofuels: Advantages , Energy from biomass, Biogas, Biohydrogen, Biosafety • Toxicity Bio magnification, Threshold Dose, Factor Affecting Toxicity.	*		*	*	*	*	*
			CO2 - Students will gain about environmental pollutions, preventive measures.	*	*	*	*	*	*	*
			CO3 - Explain the microbial processes and growth requirements underlying the activated sludge process, nitrification, denitrification, enhanced phosphorus removal, and anaerobic digestion	*	*	*	*	*	*	

VI	19117DSC65B	Environmental Management	CO1 - The students in the course are exposed to the diversity, function, ecological adaptation of microorganisms within the environment	*	*	*	*	*	*	*
			CO2 - This course gives the importance of microbial life to key ecosystem process and teaches the role of biotechnology to address environmental issues	*	*	*	*	*	*	*
VI	19117PRW67	Project Work	CO1 - Understand basic concepts of research and its methodologies	*	*	*	*	*	*	*
			CO2 - Identify appropriate research problem and parameters	*	*		*	*	*	*
			CO3 - Prepare a research report	*	*	*	*	*	*	*
VI	19120SEC06A	Skill Based Elective – VI	CO1 - Learn to create animated graphics, add sound and interactivity.	*		*	*	*	*	*
			CO2 - Can develop Website	*	*	*		*	*	*
			CO3 - CD based presentations	*	*		*	*	*	*
VI	19111SEC06L	Communicative English Lab-VI	CO1 - Apply study skills	*	*		*	*	*	*
			CO2 - Widen creative thinking		*	*	*	*	*	*
			CO3 - Be a good team worker	*	*		*	*	*	*
			CO4 - Make them proficient in English	*	*		*	*		*



PRIST
 DEEMED TO BE
 UNIVERSITY
 NAAC ACCREDITED
 THANJAVUR – 613 403 - TAMILNADU

School of Arts and Science
Department of Biotechnology
19UGBTGEC
2019 Regulation
Program Outcomes and Course outcomes of
B.Sc., Mapping of COs and Pos

Semester	Course Code	Title of the Course	Cos	POS						
				PO1	PO 2	PO 3	PO 4	PO 5	PO 6	PO7
I	19110AEC11	Language-I (Tamil-I)	CO1 - Learn the changes that have occurred in literature since the classical period.	3	0	2	1	2	0	2
			CO2 - Make use of vocabulary systematically.	2	1	2	0	1	2	3
			CO3 - Understand how to lead one's life realizing the modernity and its environment/atmosphere.	3	2	1	0	2	2	1
I	19111AEC11	Advanced English-I	CO1 - Develop vocabulary	1	2	2	0	3	1	2
			CO2 - Learn to edit and do proof reading	1	2	0	3	2	0	1
			CO3 - Read and comprehend literature	1	1	2	0	1	2	3
I	19111AEC12	English-I	CO1 - Read and comprehend literature	2	1	2	3	0	3	2
			CO2 - Appreciate poetry and prose	3	0	1	2	2	2	3
			CO3 - Familiarize students with fiction.	0	1	2	1	3	0	3
I	19117AEC13	Fundamentals of Biological system	CO1 - Understand the physical, chemical, and mathematical basis of biology	2	0	3	1	2	0	3
			CO2 - Appreciate the different scales of biological systems	2	3	0	3	2	2	1

			CO3 - To understand the Basics in life sciences, evolution and organization of life, living and non-living things	3	2	2	3	2	3	1
			CO4 - To understand the basics of biomolecules, carbohydrates, proteins, lipids and Nucleic acids	1	1	2	3	3	2	1
I	19117AEC15L	Fundamentals of Biological system Lab	CO1 - The learners will acquire knowledge on the structure and functions relationship of biological system and as well their roll in various biological process	3	3	2	1	0	2	3
			CO2 - To know the cellular organization of life, cell theory- cell organization-cell organelles- plant and animal cell	1	2	3	1	1	2	2
			CO3 - To understanding the basic fundamentals of Biological System	2	1	1	3	2	1	2
I	19115AEC15A	Biological Chemistry	CO1 - The learners will acquire knowledge on the structure and functions relationship of proteins nucleic acid carbohydrates and as well their roll in various biological process	1	1	2	0	2	2	3
			CO2 - They study the influence and role of structure in reactivity of biomolecules	1	2	2	3	1	2	3
			CO3 - Through this course the students are exposed to importance of biological macromolecules	1	2	1	1	2	1	2
I	19115AEC16AL	Biological Chemistry Lab	CO1 - Students will use current biochemical and molecular techniques to plan and carry out experiments.	3	2	0	2	3	1	2

			CO2 - Biochemistry Majors will gain proficiency in basic laboratory techniques in both chemistry and biology, and be able to apply the scientific method to the processes of experimentation and hypothesis testing	3	0	1	1	2	2	3
			CO3 - At the end of the course, the students have a thorough understanding on the role of biomolecules and their functions	1	2	3	1	2	3	3
I	19120SEC01A	Skill Based Elective-I	CO1 - Recognize when to use each of the Microsoft Office programs to create professional and academic documents.	3	2	1	0	2	1	0
			CO2 - Use Microsoft Office programs to create personal, academic and business documents following current professional and/or industry standards.	3	2	0	2	1	1	2
			CO3 - Apply skills and concepts for basic use of computer hardware, software, networks, and the Internet in the workplace and in future coursework as identified by the internationally accepted Internet and Computing Core (IC3) standards.	2	0	1	1	2	2	3
I	19111SEC01L	Communicative English Lab-I	CO1 - Learn grammar.	1	1	2	0	1	2	3
			CO2 - Enrich vocabulary	2	0	3	2	1	0	1
			CO3 - Understand the process of communication	3	2	0	1	0	2	1
			CO4 - Develop listening skill	1	3	0	1	0	2	2
I	191INDCONS	Indian Constitution	CO1 - Democratic values and citizenship Training and gained	3	2	1	0	2	3	1
			CO2 - Awareness on fundamental Rights are established	3	1	1	2	2	3	0
			CO3 - The functions of union Government and State Government are learnt	2	3	2	1	2	3	3
			CO4 - The Power and functions of the Judiciary learnt thoroughly	2	1	0	1	2	2	3

			CO5 - Appreciation of Democratic Parliamentary Rule is learnt	1	2	0	2	1	2	0
II	19110AEC21	Language-II (Tamil-II)	CO1 - Know what devotion really is.	1	1	2	0	1	2	3
			CO2 - Know the fruitfulness obtained through devotion	1	2	2	0	1	1	2
			CO3 - Perceive the progress achieved in the society through devotion.	1	3	0	2	1	1	2
II	19111AEC21	Advanced English-II	CO1 - Develop technological skills.	1	2	0	2	1	1	2
			CO2 - Able to write in a variety of formats	1	1	2	2	0	1	2
			CO3 - Read biographies and develop personality	1	1	1	2	0	2	3
II	19111AEC22	English-II	CO1 - Appreciate different forms of literature	2	0	2	2	1	1	1
			CO2 - Acquire language skills through literature	1	2	3	1	0	2	1
			CO3 - Broadens the horizon of knowledge	1	3	2	1	0	1	2
II	19117AEC23	Cell Biology and Genetics	CO1 - This paper will enable the students to learn the basics and lay strong foundation in understanding the composition of cells, how cells works is fundamental to living systems.	1	2	2	3	0	3	2
			CO2 - The course outcome is to train the students in understanding genetics and relate modern DNA technology for disease diagnostics and therapy	1	2	1	0	1	1	2
			CO3 - Students will be taught Mendelian genetics, their principles and gene interaction.	3	2	1	0	2	3	3
			CO4 - This gives them a strong foundation on the basic unit of life.	2	1	2	3	1	2	3

II	19117AEC24L	Cell Biology and Genetics lab	CO1 - Able to isolate the DNA, identify and distinguish different blood cells, to solve simple genetic problems and analyze Human karyotype	1	2	2	1	2	1	2
			CO2 - The course teaches the students about genes at molecular level	2	2	3	0	3	2	1
			CO3 - They learn about DNA, RNA and their replication, mutations, DNA repair mechanism	1	2	2	3	2	0	1
II	19116AEC25	Microbiology	CO1 - This fundamental paper discusses the importance of microorganisms	1	1	1	0	3	3	2
			CO2 - The course throws light on types of microorganisms in and around humans	2	3	0	1	2	1	2
			CO3 - At the end of the course, the student has understanding on the metabolism and mechanism of microbial life	2	3	0	3	2	1	1
			CO4 - Gain knowledge about metabolism.	2	2	0	3	2	3	1
II	19116AEC26L	Microbiology lab	CO1 - Develop basic skill in aseptic techniques	3	2	1	0	2	2	1
			CO2 - Understand various accessories for microbiology practical's	1	2	0	2	3	2	1
			CO3 - Perform various staining techniques	2	2	1	0	2	2	2
			CO4 - Cultivate bacteria with different cultivation technique	2	1	0	2	3	1	2
II	19117RLC27	Research LED Seminar	CO1 - Exposure to various research domains	2	1	2	0	3	1	1
			CO2 - Acquaintance with languages of research	2	0	2	3	3	2	1

			CO3 - Development of research aptitude	2	1	1	0	1	2	3
II	19120SEC02A	Skill Based Elective – II	CO1 - Identify the names and functions of the PowerPoint interface.	1	2	0	2	1	3	2
			CO2 - Create, edit, save, and print presentations.	1	2	1	0	1	0	3
			CO3 - Format presentations.	3	2	0	1	2	3	2
			CO4 - Add a graphic to a presentation.	2	3	3	2	0	1	2
			CO5 - Create and manipulate a simple slideshow with outlines and notes.	1	2	1	0	1	2	3
			CO6 - Create slide presentations that include text, graphics, animation, and transitions.	1	2	3	1	0	2	3
II	19111SEC02L	Communicative English Lab-II	CO1 - Learn grammar.	1	2	1	1	0	2	3
			CO2 - Use a variety of reading strategies	1	2	0	1	2	3	2
			CO3 - Enhance the skill of making grammatically correct sentences.	1	1	2	3	2	0	1
III	19110AEC31	Language-III (Tamil-III)	CO1 - Achieve one's goal by following the ancestral path	2	1	2	0	3	2	1
			CO2 - Learn to lead life of perfection by realizing the uncertainty in the life	3	2	1	1	2	0	2
			CO3 - Attain happiness through honesty	2	3	2	3	0	1	2
III	19111AEC31	Advanced English-III	CO1 - Understand phonetics.	2	1	0	2	3	1	2
			CO2 - Develop writing skill	3	2	1	2	0	2	1

			CO3 - Able to develop creative writing	2	1	2	0	1	1	1
III	19111AEC32	English-III	CO1 - Enable to appreciate different types of prose	2	1	0	2	1	3	2
			CO2 - Develop the conversational skills through one-act plays	2	0	3	2	1	2	3
			CO3 - Enhance the skill of making grammatically correct sentences.	2	3	2	1	0	1	1
III	19117AEC33	Plant Physiology	CO1 - Impart an insight into the various plant water relations	0	1	2	1	1	1	1
			CO2 - Learning about the mineral nutrition in plants	3	0	1	2	3	2	1
			CO3 - Understand the mechanism of various metabolic processes in plants	1	2	2	0	2	1	1
			CO4 - Understand the respiration in higher plants with particular emphasis on aerobic and anaerobic respiration.	2	0	3	1	1	2	2
III	19117AEC34L	Plant physiology Lab	CO1 - Equip students with skills and techniques related to plant physiology so that they can design their own experiments	1	2	1	3	3	2	1
			CO2 - Learn about the movement of sap and absorption of water in plant body.	1	2	3	0	2	1	3
			CO3 - Understand the plant movements	1	2	3	2	1	1	2
III	19117AEC35	Immunology	CO1 - The students may understand the immune system, its components and various techniques used in bio manipulation.	1	2	1	2	3	1	2
			CO2 - This course gives an overview on the immune system including organs, cells and receptors	3	2	1	3	2	0	2

			CO3 - The students learns about molecular basis of antigen recognition, hypersensitivity reaction, antigen-antibody reactions	3	0	3	2	1	1	2
			CO4 - The course develops in the student an appreciation for principles of immunology and its applications in treating human diseases	3	2	1	0	3	2	1
III	19117AEC36L	Immunology Lab	CO1 - Identify the structure, function, and characteristics of immunoglobulins.	1	2	0	3	2	1	1
			CO2 - Explain the principles of and perform serological tests.	2	3	1	2	3	0	2
			CO3 - It's a paper which accomplishes the learning of techniques involved in understanding the immunological aspects of physiology and biological samples	3	3	0	2	1	2	2
III	19117RMC37	Research Methodology	CO1 - Understanding research questions and tools	1	2	3	2	3	3	1
			CO2 - Experience in scientific writings	2	1	2	3	0	2	3
			CO3 - Practice in various aspects of scientific publications	2	0	1	2	1	2	3
			CO4 - Inculcation of research ethics	2	1	2	0	2	1	3
III	19120SEC03A	Skill based Elective-III	CO1 - Indicate the names and functions of the Excel interface components.	2	3	1	3	0	3	3
			CO2 - Enter and edit data.	2	1	2	2	0	1	2
			CO3 - Format data and cells.	1	2	0	1	1	1	2
			CO4 - Construct formulas, including the use of built-in functions, and relative and absolute references.	2	3	1	1	1	0	2

			CO5 - Create and modify charts.	1	2	0	1	1	1	2
			CO6 - Preview and print worksheets	1	2	2	0	1	2	3
III	19111SEC03L	Communicative English Lab-III	CO1 - Learn grammar.	1	2	0	1	1	1	2
			CO2 - Enhance their fluency in English	0	0	0	3	0	0	0
			CO3 - Develop speaking and writing skills	1	2	1	1	0	1	2
			CO4 - Develop individual perspectives that demonstrate critical thinking skills	1	0	1	1	0	1	1
IV	19110AEC41	Language-IV (Tamil-IV)	CO1 - Realize how the ancient people changed their lifestyle according to the ages	1	2	0	1	1	1	0
			CO2 - Learn how to change one's lifestyle according to the needs of the future	1	1	0	2	2	1	1
			CO3 - Accept the modern trends and its uses	1	1	0	2	1	2	1
IV	19111AEC41	Advanced English-IV	CO1 - Develop writing skill.	1	0	2	1	2	2	1
			CO2 - Comprehend and describe poems	1	2	1	1	0	1	2
			CO3 - Learn interviewing skills	1	2	0	1	1	2	2
IV	19111AEC42	English-IV	CO1 - Improve their ability to read and understand them	2	1	0	1	1	1	1
			CO2 - Know the genius of Shakespeare	2	1	0	1	0	1	2
			CO3 - Express in writing their views.	1	1	2	1	2		1

IV	19117AEC43	Animal physiology	CO1 - To provide advanced undergraduate and introductory graduate students with a comprehensive overview of animal physiology from molecular, cellular and whole animal systems approaches.	1	0	2	2	0	2	0
			CO2 - To critically evaluate clinical and research case problems relating to endocrinology and cell biology.	1	1	1	1	1	0	1
IV	19117AEC44L	Animal Physiology Lab	CO1 - Have an enhanced knowledge and appreciation of mammalian physiology	3	3	2	1	3	0	3
			CO2 - Understand the functions of important physiological systems including the cardiorespiratory, renal, reproductive and metabolic systems	2	1	2	3	0	2	2
			CO3 - It trains the students with essentiality of molecules, cells, tissues and organs involved in the defense mechanism	1	2	3	3	2	1	3
IV	19117AEC45	Bioinformatics and biostatistics	CO1 - Know the applications and limitations of different bioinformatics and statistical methods.	2	1	2	3	2	1	2
			CO2 - Be able to perform and interpret bioinformatics and statistical analyses with real molecular biology data.	2	3	3	2	0	1	1
			CO3 - Be able to describe statistical methods and probability distributions relevant for molecular biology data.	3	3	0	3	2	1	2
IV	19117AEC46L	Bioinformatics and Biostatistics Lab	CO1 - This laboratory course will prepare the students for various applications of bioinformatics in life science research.	1	2	2	3	3	2	1
			CO2 - The student will be able to apply basic principles of biology, computer science and mathematics to address complex biological problems	1	2	3	2	0	1	2

			CO3 - This course imparts the knowledge of basic statistical methods to solve problems	1	3	0	2	1	1	2
IV	19120SEC04A	Skill based Elective-IV	CO1 - Examine database concepts and explore the Microsoft Office Access environment.	1	2	0	2	1	0	2
			CO2 - Design a simple database.	1	1	1	0	1	2	2
			CO3 - Build a new database with related tables.	2	2	3	2	3	1	2
			CO4 - Manage the data in a table.	2	1	1	2	3	1	1
			CO5 - Query a database using different methods.	1	2	0	1	1	2	1
			CO6 - Design a form.	1	0	2	1	0	1	2
			CO7 - Generate a report.	2	1	3	0	2	0	1
			CO8 - Import and export data.	1	1	0	1	1	1	1
IV	19111SEC04L	Communicative English Lab-IV	CO1 - Learn grammar	1	2	0	1	2	0	1
			CO2 - Enable to express their views in conversation	0	1	2	1	0	1	1
			CO3 - Develop soft skills	1	0	1	2	1	1	1
			CO4 - Enhance presentation skills	1	2	0	1	2	1	1
IV	191ENVTSTU	Environmental Studies	CO1 - Understand ecosystem	2	0	1	1	1	0	1
			CO2 - Know social issues and the environment	1	1	0	1	2	1	1
			CO3 - Learn keep the environment eco-friendly	1	1	2	1	0	1	1

V	19117AEC51	Developmental Biology	CO1 - Be able to list the types of characteristics that make an organism ideal for the study of developmental biology	1	2	0	1	1	0	1
			CO2 - Be familiar with the events that lead up to and comprise the process of fertilization.	1	2	0	1	1	1	1
			CO3 - Be able to compare and contrast the process of gastrulation in the various model organisms discussed	1	2	3	0	3	3	2
V	19117SEC52	Cell and Tissue culture	CO1 - Fundamentals of plant tissue culture. Plant regeneration and organogenesis. Embryogenesis. Organ, anther and pollen culture. Ovary, ovule and embryo culture. Callus suspension culture.	3	1	1	0	1	2	1
			CO2 - Protoplast, isolation, culture and fusion.	3	2	1	0	2	1	3
			CO3 - Production of hybrids and cybrids.	2	3	3	1	2	0	2
V	19117AEC53	Enzyme and enzyme technology	CO1 - The course will provide an overview of the key enzymes currently used in large scale industrial processes	1	2	2	0	1	2	3
			CO2 - This course includes the isolation, purification and characterization of enzymes and their applications	2	1	0	3	2	1	1
			CO3 - Discover the current and future trends of applying enzyme technology for the commercialization purpose of biotechnological products.	1	0	3	1	1	2	2
V	19117AEC54L	Developmental biology, tissue culture lab	CO1 - Demonstrate a basic understanding of developmental terms and mechanisms.	1	0	2	1	2	3	2
			CO2 - Utilize laboratory techniques to design and carry-out experimental studies.	1	2	0	1	2	3	1

			CO3 - Conservation of endangered plant species	1	2	0	1	2	1	1
			CO4 - Molecular, pharmacological and biochemical investigations of different aspects of plant growth and development such as in vitro flowering.	2	1	3	2	1	1	3
V	19117AEC55L	Enzyme and Enzyme Technology Lab	CO1 - Distinguish the fundamentals of enzyme properties, nomenclatures, characteristics and mechanisms	3	2	0	2	1	2	3
			CO2 - Apply biochemical calculation for enzyme kinetics	1	2	3	0	1	2	3
			CO3 - Compare methods for production, purification, characterization and immobilization of enzymes	3	0	3	2	0	2	1
			CO4 - Discuss various application of enzymes that can benefit human life	3	2	2	1	3	0	1
V	19117DSC56A	Discipline Specific Elective -I rDNA Technology	CO1 - Utilize the knowledge on creation of a genomic library	3	2	1	0	2	1	3
			CO2 - Explain the significance of model organisms in recombinant DNA technology	2	0	2	3	2	1	2
			CO1 - This course teaches rDNA technology techniques and their application in the field of genetic engineering They learn about plasmids, vectors and gain knowledge on the construction of cDNA libraries	3	2	1	0	3	2	1
V	19117DSC56B	Molecular Biology	CO1 - Understand and apply the principles and techniques of molecular biology which prepares students for further education and/or employment in teaching, basic research or the health professions	1	2	3	0	1	2	1
			CO2 - Explain the concept of recombination, linkage mapping and elucidate the gene transfer mechanisms in prokaryotes and eukaryotes	2	1	1	1	2	0	3

			CO3 - Know the terms and terminologies related to molecular biology and microbial	2	3	3	2	2	0	1
V	19117BRC57	Participation in Bounded Research	CO1 - Hands on exposure to problem solving tools in contemporary research	1	2	3	3	2	2	3
			CO2 - Evolution of research intuitiveness and orientation	3	2	3	0	2	1	3
			CO3 - Familiarity with cutting edge research trends	1	2	2	1	2	3	1
V	19120SEC05A	Skill based Elective-V	CO1 - Work with the Photoshop workspace	2	1	1	2	1	2	1
			CO2 - Navigate images	1	2	1	0	3	2	1
			CO3 - Resize and crop images	1	3	2	1	1	2	3
			CO4 - Make and work with selections	1	3	1	0	3	2	1
			CO5 - Create new layers and perform other basic layer functions	1	1	2	1	2	0	1
			CO6 - Transform images	1	0	1	2	1	1	1
V	19111SEC05L	Communicative English Lab-V	CO1 - Develop corporate skills.	1	2	0	3	1	1	1
			CO2 - Handle their day to day affairs well with their knowledge of language skills.	1	1	1	1	1	0	1
			CO3 - Get a Job.	1	2	0	2	1	2	3
VI	19117AEC61	Plant and Animal Biotechnology	CO1 - This course teaches organization and expression of plant and animal genome and plant and animal tissue culture	1	1	2	1	0	1	1
			CO2 - Students learn about transgenic animal, their application in pharmaceutical industry, cloning and its importance.	1	1	0	3	2	1	1

			CO3 - This course prepares the students in appreciating the its benefits and applications in biotechnological, pharmaceutical, medical and agricultural field	1	2	1	1	1	0	3
VI	19117SEC62	Applied Biotechnology	CO1 - Evaluate and describe systems of product research, development, and production	1	2	1	1	0	2	2
			CO2 - Analyze the potential for commercialization for innovations within the biotechnology industry	1	1	0	1	1	0	1
			CO3 - The students will gain the basic knowledge of aquaculture and Students will solve a variety of problems using creative thinking skills and analytical skills in the lab.	1	2	1	0	1	2	1
VI	19117SEC63L	Plant, Animal and Applied Biotechnology Lab	CO1 - The students should have knowledge on biotechnological analysis and the utilization of these knowledge about procedures and utilization of such knowledge to combine biotechnological methods to obtain analytical results	1	2	3	0	2	1	1
			CO2 - The students will develop fundamental knowledge in Plant Molecular Biotechnology and its application in laboratory and industry settings.	1	2	3	1	1	0	2
			CO3 - Describe mechanisms of plant pollination and differentiate between haploid and diploid cells and their role in sexual reproduction	1	2	3	3	0	2	1
VI	19117AEC64L	Environmental Biotechnology Lab	CO1 - To present an overview of important environmental biotechnologies involved in treatment of pollutants and resource recovery	1	0	2	3	2	1	3
			CO2 - The students will be able to demonstrate the use of environmental science principle in solving various environmental problems	1	2	3	3	2	1	3

			CO3 - Describe the most commonly applied disinfection methods, and the steps typically involved in drinking water treatment process	3	1	1	0	2	1	2
VI	19117DSC65A	Discipline Specific Elective - II Environmental Biotechnology	CO1 - Biofuels: Advantages , Energy from biomass, Biogas, Biohydrogen, Biosafety • Toxicity Bio magnification, Threshold Dose, Factor Affecting Toxicity.	1	0	2	2	1	3	2
			CO2 - Students will gain about environmental pollutions, preventive measures.	2	1	3	2	1	3	1
			CO3 - Explain the microbial processes and growth requirements undelaying the activated sludge process, nitrification, denitrification, enhanced phosphorus removal, and anaerobic digestion	1	2	3	1	1	2	0
VI	19117DSC65B	Environmental Management	CO1 - The students in the course are exposed to the diversity, function, ecological adaptation of microorganisms within the environment	2	1	3	2	1	1	2
			CO2 - This course gives the importance of microbial life to key ecosystem process and teaches the role of biotechnology to address environmental issues	1	2	1	2	3	1	2
VI	19117PRW67	Project Work	CO1 - Understand basic concepts of research and its methodologies	1	2	3	2	1	1	3
			CO2 - Identify appropriate research problem and parameters	2	3	0	1	1	1	1
			CO3 - Prepare a research report	1	2	2	3	1	2	1
VI	19120SEC06A	Skill Based Elective – VI	CO1 - Learn to create animated graphics, add sound and interactivity.	1	0	2	1	2	1	1
			CO2 - Can develop Website	2	1	1	0	1	1	2

			CO3 - CD based presentations	3	2	0	2	1	2	1
VI	19111SEC06L	Communicative English Lab-VI	CO1 - Apply study skills	1	2	0	2	1	1	1
			CO2 - Widen creative thinking	0	2	2	1	1	2	1
			CO3 - Be a good team worker	1	2	0	2	1	1	2
			CO4 - Make them proficient in English	1	1	0	1	2	0	3

1- Low, 2-Medium, 3- Higher, 0 No correlation



PRIST
DEEMED TO BE
UNIVERSITY
NAAC ACCREDITED
THANJAVUR – 613 403 - TAMILNADU

School of Arts and Science
Department of Biotechnology
19PGBTGEC
2019 Regulation
Program Outcomes and Course outcomes of
M.Sc., Mapping of COs and POs

Semester	Course Code	Title of the Course	COs	POS					
				PO1	PO2	PO3	PO4	PO5	PO6
I	19217AEC11	General Microbiology	CO1 - Students can gain the idea of how to identify the microorganisms based on the modern polyphasic approach.	*	*		*	*	*

	19217AEC12	Molecular genetics	CO2 - After successful completion of the paper the students will get an overall view about genetic makeup of organisms and can take up a career in research.	*	*	*			*
	19217AEC13	Biochemistry	CO3 - This paper in biochemistry has been designed to provide the student with a firm foundation in the biochemical aspects of cellular functions which forms a base for their future research.	*	*	*	*	*	*
	19217SEC14L	Microbiology & Molecular Genetics Lab	CO1 - After successful completion of the paper the students will get an overall view about genetic makeup of organisms and can take up a career in research.	*	*			*	*
	19217DSC15A	Immunology	CO1 - This course will provide the student insights into the various aspects of Immunology such as classical immunology, clinical immunology, Immunotherapy and diagnostic immunology.	*	*	*		*	*
	19217DSC15B	Biosafety and Biodiversity	CO1 - To study the diversity of plants and animal life in a particular habitat, ethical issues and potential of biotechnology for the benefit of man kind	*	*		*	*	*
	19217RLS16	Research Led Seminar	CO1 - Exposure to various research domains	*	*		*	*	*
CO2 - Acquaintance with languages of research			*	*	*	*	*	*	
CO3 - Development of research aptitude			*	*	*	*	*	*	
II	19217AEC21	Cell & Molecular Biology	CO1 - Students after completion of this paper will be exceptionally well prepared to pursue careers in cellular and sub cellular biological research, biomedical research, or medicine or allied health fields.	*		*	*	*	*

19217AEC22	Biophysics & Bioinformatics	CO2 - This paper has been designed to give the students comprehensive training in the emerging and exciting upcoming field of Systems Biology, which will help students to get career in both industry/R&D.	*			*	*	*
19217AEC23	Industrial Biotechnology	CO1 - This course is important in the era of industrialization leading to environmental hazards and hence will help students to take up a career in tackling industrial pollution and also to take up the research in areas like development of biological systems for remediation of contaminated environments (land, air, water), and for environment-friendly processes such as green manufacturing technologies and sustainable development.	*	*	*	*	*	*
19217SEC24L	Molecular Biology & Industrial Biotechnology Lab	CO1 - Students after completion of this paper will be exceptionally well prepared to pursue careers in cellular and sub cellular biological research, biomedical research, or medicine or allied health fields	*	*		*	*	*
19217DSC25A	Endocrinology	CO1 -To know the pathophysiological significance of the system with special reference to humans.	*			*	*	*
19217DSC25B	Intellectual Property Rights	CO1 - To get registration in our country and foreign countries of their invention, designs and thesis or theory written by the students during their project work and for this they must have knowledge of patents, copy right, trademarks, designs and information Technology Act. Further teacher will have to demonstrate with products and ask the student to identify the different types of IPR'	*		*	*	*	*

	19217RMC26	Research Methodology	CO1 - Understanding research questions and tools	*	*	*	*	*	*
			CO2 - Experience in scientific writings	*	*	*	*	*	*
			CO3 - Practice in various aspects of scientific publications	*	*	*	*	*	*
			CO4 - Inculcation of research ethics	*	*	*	*	*	*
	19217BRC27	Participation in Bounded Research	CO1 - Hands on exposure to problem solving tools in contemporary research	*				*	*
			CO2 - Evolution of research intuitiveness and orientation	*				*	*
			CO3 - Familiarity with cutting edge research trends	*			*	*	*
III	19217AEC31	Genomics	CO1 - Acquire the aspects of Gene Contig and Shotgun method.	*	*	*	*	*	*
			CO2 - Know the features of the Genome Mapping databases.	*	*	*	*	*	*
	19217AEC32	Proteomics	CO1 - Gain knowledge on phylogenetic profiles	*	*	*	*	*	*
			CO2 - Describe the features of Yeast two-hybrid system.	*	*	*	*	*	*
	19217SEC33L	Genomics & Proteomics - Lab	CO1 - This paper will help students interested in careers as laboratory, research or animal care technicians in the fields of veterinary and human health or biotechnology.	*	*		*	*	*

	19217DSC34A	Discipline specific elective III Nanobiotechnology	CO1 - This course will act as a bridge between students from non-biology course at all levels	*			*	*	*
	19217DSC34B	Discipline specific elective III Environmental biotechnology	CO1 - This course is important in the era of industrialization leading to environmental hazards and hence will help students to take up a career in tackling industrial pollution and also who is willing to take up the research in areas like development of biological systems for remediation of contaminated environments (land, air, water), and for environment- friendly processes such as green manufacturing technologies and sustainable development	*	*	*	*	*	*
IV	19217AEC41	Food Technology	CO1 - To understand the basic food safety issues in the food market	*	*	*	*	*	*
			CO2 - To develop and evaluate quality of new food products using objective and subjective methodologies.	*			*	*	*
			CO3 - To understand the basic concepts in food chemistry and food analysis	*	*	*	*	*	*
	19217AEC42	Bio instrumentation	CO1 - Check for analytical functions and find the analytical function and study	*	*	*	*	*	*
			CO2 - Learn the measurement systems, errors of measurement	*	*	*	*	*	*
			CO3 - Demonstrate basic knowledge of Biotechniques	*			*	*	*
	19217SEC43L	Food technology and Bio instrumentation lab	CO1 - Ability to apply principles of food engineering in industry.	*	*	*	*	*	*
			CO2 - Understand, identify and analyze a problem related to food industry and ability to find an appropriate solution for the same.	*	*	*	*	*	*

19217DSC44A	Gene therapy utilization pharmacology	CO1 - Understand some of the types of disease that might be treatable by gene therapy	*	*	*	*	*	*
		CO2 - Understand the basic principles of genetic manipulation	*			*	*	*
		CO3 - Understand how genetics may be used in the design of drugs	*	*	*	*	*	*
19217DSC44B	Plant conservation & disaster management	CO1 - To make sustainable utilization of species and ecosystems	*	*	*	*	*	*
		CO2 - Familiarity with disaster management theory (cycle, phases) Knowledge about existing global frameworks and existing agreements (e.g. Sendai)	*	*	*	*	*	*
		CO3 - Regulatory practices, biosensors and applications in Pharmaceuticals	*			*	*	*
		CO4 - Quality Assurance and Validation	*	*	*	*	*	*
19217PRW45	Project work	CO1 - Experience from a master's project and international literature.	*			*	*	*
		CO2 - Develop ability to independently carry out a complete scientific process.	*	*	*	*	*	*
		CO3 - Learn about how to write dissertations and proposals for the scientific community.	*	*	*	*	*	*



PRIST
DEEMED TO BE
UNIVERSITY
NAAC ACCREDITED
THANJAVUR – 613 403 - TAMILNADU

School of Arts and Science
Department of Biotechnology
19PGBTGEC
2019 Regulation
Program Outcomes and Course outcomes of
M.Sc., Mapping of COs and Pos

Semester	Course Code	Title of the Course	COs	POS					
				PO1	PO2	PO3	PO4	PO5	PO6
I	19217AEC11	General Microbiology	CO1 - Students can gain the idea of how to identify the microorganisms based on the modern polyphasic approach.	3	1	0	1	2	2
	19217AEC12	Molecular genetics	CO2 - After successful completion of the paper the students will get an overall view about genetic makeup of organisms and can take up a career in research.	2	0	0	1	2	2
	19217AEC13	Biochemistry	CO3 - This paper in biochemistry has been designed to provide the student with a firm foundation in the biochemical aspects of cellular functions which forms a base for their future research.	3	0	0	3	2	2
	19217SEC14L	Microbiology & Molecular Genetics Lab	CO1 - After successful completion of the paper the students will get an overall view about genetic makeup of organisms and can take up a career in research.	2	2	1	0	1	2

	19217DSC15A	Immunology	CO1 - This course will provide the student insights into the various aspects of Immunology such as classical immunology, clinical immunology, Immunotherapy and diagnostic immunology.	2	1	1	0	0	1
	19217DSC15B	Biosafety and Biodiversity	CO1 - To study the diversity of plants and animal life in a particular habitat, ethical issues and potential of biotechnology for the benefit of man kind	3	1	1	2	2	1
	19217RLS16	Research Led Seminar	CO1 - Exposure to various research domains	3	2	1	0	2	2
			CO2 - Acquaintance with languages of research	3	2	2	0	0	1
			CO3 - Development of research aptitude	2	1	1	2	2	1
	II	19217AEC21	Cell & Molecular Biology	CO1 - Students after completion of this paper will be exceptionally well prepared to pursue careers in cellular and sub cellular biological research, biomedical research, or medicine or allied health fields.	2	1	1	1	1
19217AEC22		Biophysics & Bioinformatics	CO2 - This paper has been designed to give the students comprehensive training in the emerging and exciting upcoming field of Systems Biology, which will help students to get career in both industry/R&D.	2	1	1	2	1	1
19217AEC23		Industrial Biotechnology	CO1 - This course is important in the era of industrialization leading to environmental hazards and hence will help students to take up a career in tackling industrial pollution and also to take up the research in areas like development of biological systems for remediation of contaminated environments (land, air, water), and for environment-friendly processes such as green manufacturing technologies and sustainable development.	2	1	0	1	1	1

19217SEC24L	Molecular Biology & Industrial Biotechnology Lab	CO1 - Students after completion of this paper will be exceptionally well prepared to pursue careers in cellular and sub cellular biological research, biomedical research, or medicine or allied health fields	2	1	0	0	1	2
19217DSC25A	Endocrinology	CO1 -To know the pathophysiological significance of the system with special reference to humans.	1	2	0	1	1	3
19217DSC25B	Intellectual Property Rights	CO1 - To get registration in our country and foreign countries of their invention, designs and thesis or theory written by the students during their project work and for this they must have knowledge of patents, copy right, trademarks, designs and information Technology Act. Further teacher will have to demonstrate with products and ask the student to identify the different types of IPR'	2	2	1	1	2	2
19217RMC26	Research Methodology	CO1 - Understanding research questions and tools	1	2	1	1	2	2
		CO2 - Experience in scientific writings	3	1	1	0	2	1
		CO3 - Practice in various aspects of scientific publications	3	1	1	0	2	1
		CO4 - Inculcation of research ethics	3	1	1	1	2	1
19217BRC27	Participation in Bounded Research	CO1 - Hands on exposure to problem solving tools in contemporary research	3	0	0	2	1	2
		CO2 - Evolution of research intuitiveness and orientation	3	1	0	3	1	1
		CO3 - Familiarity with cutting edge research trends	2	1	0	3	1	1

III	19217AEC31	Genomics	CO1 - Acquire the aspects of Gene Contig and Shotgun method.	2	2	0	3	2	1
			CO2 - Know the features of the Genome Mapping databases.	1	1	0	1	1	1
	19217AEC32	Proteomics	CO1 - Gain knowledge on phylogenetic profiles	1	1	1	1	1	1
			CO2 - Describe the features of Yeast two-hybrid system.	2	1	1	1	1	1
	19217SEC33L	Genomics & Proteomics - Lab	CO1 - This paper will help students interested in careers as laboratory, research or animal care technicians in the fields of veterinary and human health or biotechnology.	3	0	2	2	2	1
	19217DSC34A	Discipline specific elective III Nanobiotechnology	CO1 - This course will act as a bridge between students from non-biology course at all levels	2	1	1	1	2	2
19217DSC34B	Discipline specific elective III Environmental biotechnology	CO1 - This course is important in the era of industrialization leading to environmental hazards and hence will help students to take up a career in tackling industrial pollution and also who is willing to take up the research in areas like development of biological systems for remediation of contaminated environments (land, air, water), and for environment- friendly processes such as green manufacturing technologies and sustainable development	2	1	2	1	1	2	
IV	19217AEC41	Food Technology	CO1 - To understand the basic food safety issues in the food market	2	2	2	1	1	2
			CO2 - To develop and evaluate quality of new food products using objective and subjective methodologies.	2	0	0	1	1	2

		CO3 - To understand the basic concepts in food chemistry and food analysis	2	0	0	1	1	2
19217AEC42	Bio instrumentation	CO1 - Check for analytical functions and find the analytical function and study	2	1	1	1	1	2
		CO2 - Learn the measurement systems, errors of measurement	3	0	1	1	1	2
		CO3 - Demonstrate basic knowledge of Biotechniques	2	1	1	1	1	1
19217SEC43L	Food technology and Bio instrumentation lab	CO1 - Ability to apply principles of food engineering in industry.	3	0	1	0	2	1
		CO2 - Understand, identify and analyze a problem related to food industry and ability to find an appropriate solution for the same.	2	1	1	0	1	1
19217DSC44A	Gene therapy utilization pharmacology	CO1 - Understand some of the types of disease that might be treatable by gene therapy	3	1	2	0	2	1
		CO2 - Understand the basic principles of genetic manipulation	2	1	0	1	2	1
		CO3 - Understand how genetics may be used in the design of drugs	2	0	0	1	2	2
19217DSC44B	Plant conservation & disaster management	CO1 - To make sustainable utilization of species and ecosystems	1		0	1	2	2
		CO2 - Familiarity with disaster management theory (cycle, phases) Knowledge about existing global frameworks and existing agreements (e.g. Sendai)	1	1	1	1	1	2
		CO3 - Regulatory practices, biosensors and applications in Pharmaceuticals	1		0	1	1	2
		CO4 - Quality Assurance and Validation	3	1	0	1	2	2

19217PRW45	Project work	CO1 - Experience from a master's project and international literature.	2	0	0	1	2	2
		CO2 - Develop ability to independently carry out a complete scientific process.	3	0	0	3	2	2
		CO3 - Learn about how to write dissertations and proposals for the scientific community.	2	2	1	0	1	2

1- Low, 2-Medium, 3- Higher, 0 No correlation



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

School of Arts and Science
Department of Biotechnology
19MPBTGE
2019 Regulation
Program Outcomes and Course outcomes of
M. Phil., Mapping of COs and POs

Semester	Course Code	Title of the Course	COs	POS					
				PO1	PO2	PO3	PO4	PO5	PO6
I	193BTC12	Advanced Biotechnology	CO1 - Understanding research questions and tools	*		*		*	*

			CO2 - Experience in scientific writings	*	*	*		*	*
			CO3 - Practice in various aspects of scientific publications	*	*	*		*	*
			CO4 - Inculcation of research ethics	*	*		*	*	*
	193BTE13	Environmental Biotechnology	CO1 - Develop and demonstrate the advanced genetic engineering and cloning techniques	*			*	*	*
			CO2 - Explain the elaborate details of plant biotechnology like vector for gene transfer, Binary vector	*	*		*	*	*
			CO3 - Demonstrate the advanced fermentation techniques and conventional fermentation versus	*	*	*		*	*



PRIST
DEEMED TO BE
UNIVERSITY
NAAC ACCREDITED
THANJAVUR – 613 403 - TAMILNADU

School of Arts and Science
Department of Biotechnology
19PGMBGEC
2019 Regulation
Program Outcomes and Course outcomes of
M. Phil., Mapping of COs and POs

Semester	Course Code	Title of the Course	COs	POS					
				PO1	PO2	PO3	PO4	PO5	PO6
I	193BTC12	Advanced Biotechnology	CO1 - Understanding research questions and tools	3	0	1	0	2	1
			CO2 - Experience in scientific writings	2	1	1	0	1	1

			CO3 - Practice in various aspects of scientific publications	3	1	2	0	2	1
			CO4 - Inculcation of research ethics	2	1	0	1	2	1
	193BTE13	Environmental Biotechnology	CO1 - Develop and demonstrate the advanced genetic engineering and cloning techniques	2	0	0	1	2	2
			CO2 - Explain the elaborate details of plant biotechnology like vector for gene transfer, Binary vector	1	3	0	1	2	2
			CO3 - Demonstrate the advanced fermentation techniques and conventional fermentation versus biotransformation.	1	1	1	1	1	2



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

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

B.TECH - FULL TIME (UG - 2017)

COURSE CODE	COURSE TITLE	COURSE OUTCOMES
19147S11	COMMUNICATIVE ENGLISH	Read articles of a general kind in magazines and newspapers.
		Participate effectively in informal conversations; introduce themselves and their friends and express opinions in English.
		Comprehend conversations and short talks delivered in English
		Write short essays of a general kind and personal letters and emails in English.
19148S12	ENGINEERING MATHEMATICS – I	Use both the limit definition and rules of differentiation to differentiate functions.
		Apply differentiation to solve maxima and minima problems.
		Evaluate integrals both by using Riemann sums and by using the Fundamental Theorem of Calculus.
		Apply integration to compute multiple integrals, area, volume, integrals in polar coordinates, in addition to change of order and change of variables.
		Evaluate integrals using techniques of integration, such as substitution, partial fractions and integration by parts.
		Determine convergence/divergence of improper integrals and evaluate convergent improper integrals.
		Apply various techniques in solving differential equations.
19149S13	ENGINEERING PHYSICS	the students will gain knowledge on the basics of properties of matter and its applications,
		the students will acquire knowledge on the concepts of waves and optical devices and their applications in fibre optics,
		the students will have adequate knowledge on the concepts of thermal properties of materials and their applications in expansion joints and heat exchangers,

LOCAL NEEDS

REGIONAL NEEDS

NATIONAL NEEDS

GLOBAL NEEDS

		the students will get knowledge on advanced physics concepts of quantum theory and its applications in tunneling microscopes, and
		the students will understand the basics of crystals, their structures and different crystal growth techniques.
19149S14	ENGINEERING CHEMISTRY	The knowledge gained on engineering materials, fuels, energy sources and water treatment techniques will facilitate better understanding of engineering processes and applications for further learning.
19154S15	ENGINEERING GRAPHICS	familiarize with the fundamentals and standards of Engineering graphics
		perform freehand sketching of basic geometrical constructions and multiple views of objects.
		project orthographic projections of lines and plane surfaces.
		draw projections and solids and development of surfaces.
		visualize and to project isometric and perspective sections of simple solids.
17150S16	PROBLEM SOLVING AND PYTHON PROGRAMMING	Develop algorithmic solutions to simple computational problems
		Read, write, execute by hand simple Python programs.
		Structure simple Python programs for solving problems.
		Decompose a Python program into functions.
		Represent compound data using Python lists, tuples, dictionaries.
		Read and write data from/to files in Python Programs.
19150L17	PROBLEM SOLVING AND PYTHON PROGRAMMING LABORATORY	Write, test, and debug simple Python programs.
		Implement Python programs with conditionals and loops.
		Develop Python programs step-wise by defining functions and calling them.
		Use Python lists, tuples, dictionaries for representing compound data.

LOCAL NEEDS

REGIONAL NEEDS

NATIONAL NEEDS

GLOBAL NEEDS

		Read and write data from/to files in Python.
19150L18	PHYSICS AND CHEMISTRY LABORATORY	apply principles of elasticity, optics and thermal properties for engineering applications.
19147S21	TECHNICAL ENGLISH	Read technical texts and write area-specific texts effortlessly.
		Listen and comprehend lectures and talks in their area of specialisation successfully.
		Speak appropriately and effectively in varied formal and informal contexts.
		Write reports and winning job applications.
17148S22A	ENGINEERING MATHEMATICS – II	Eigen values and eigenvectors, diagonalization of a matrix, Symmetric matrices, Positive definite matrices and similar matrices.
		Gradient, divergence and curl of a vector point function and related identities.
		Evaluation of line, surface and volume integrals using Gauss, Stokes and Green's theorems and their verification.
		Analytic functions, conformal mapping and complex integration.
		Laplace transform and inverse transform of simple functions, properties, various related theorems and application to differential equations with constant coefficients.
19148S22A	PHYSICS FOR ELECTRONICS ENGINEERING	gain knowledge on classical and quantum electron theories, and energy band structures,
		acquire knowledge on basics of semiconductor physics and its applications in various devices,
		get knowledge on magnetic and dielectric properties of materials,

LOCAL NEEDS

REGIONAL NEEDS

NATIONAL NEEDS

GLOBAL NEEDS

		<p>have the necessary understanding on the functioning of optical materials for optoelectronics,</p> <p>understand the basics of quantum structures and their applications in spintronics and carbon electronics.</p>
19149S24A	ENVIRONMENTAL SCIENCE AND ENGINEERING	<p>Environmental Pollution or problems cannot be solved by mere laws. Public participation is an important aspect which serves the environmental Protection. One will obtain knowledge on the following after completing the course.</p> <p>Public awareness of environmental is at infant stage.</p> <p>Ignorance and incomplete knowledge has lead to misconceptions</p> <p>Development and improvement in std. of living has lead to serious environmental disasters</p>
19153S25C	CIRCUIT THEORY	<p>Ability to analyse electrical circuits</p> <p>Ability to apply circuit theorems</p> <p>Ability to analyse transients</p>
19154S26C	BASIC CIVIL AND MECHANICAL ENGINEERING	<p>appreciate the Civil and Mechanical Engineering components of Projects.</p> <p>explain the usage of construction material and proper selection of construction materials.</p> <p>measure distances and area by surveying</p> <p>identify the components used in power plant cycle.</p> <p>demonstrate working principles of petrol and diesel engine.</p> <p>elaborate the components of refrigeration and Air conditioning cycle.</p>
19154L27	Engineering Practices Laboratory	<p>fabricate carpentry components and pipe connections including plumbing works.</p> <p>use welding equipments to join the structures.</p> <p>Carry out the basic machining operations</p> <p>Make the models using sheet metal works</p>

LOCAL NEEDS

REGIONAL NEEDS

NATIONAL NEEDS

GLOBAL NEEDS

		<p>Illustrate on centrifugal pump, Air conditioner, operations of smithy, foundry and fittings</p>
		<p>Carry out basic home electrical works and appliances</p>
		<p>Measure the electrical quantities</p>
		<p>Elaborate on the components, gates, soldering practices.</p>
19153L28C	ELECTRIC CIRCUITS LABORATORY	<p>Understand and apply circuit theorems and concepts in engineering applications.</p>
		<p>Simulate electric circuits.</p>
19149S31C	TRANSFORMS AND PARTIAL DIFFERENTIAL EQUATIONS	<p>Understand how to solve the given standard partial differential equations.</p>
		<p>Solve differential equations using Fourier series analysis which plays a vital role in engineering applications.</p>
		<p>Appreciate the physical significance of Fourier series techniques in solving one and two dimensional heat flow problems and one dimensional wave equations.</p>
		<p>Understand the mathematical principles on transforms and partial differential equations would provide them the ability to formulate and solve some of the physical problems of engineering.</p>
		<p>Use the effective mathematical tools for the solutions of partial differential equations by using Z transform techniques for discrete time systems.</p>
19153C32	DIGITAL LOGIC CIRCUITS	<p>Ability to design combinational and sequential Circuits.</p>
		<p>Ability to simulate using software package.</p>
		<p>Ability to study various number systems and simplify the logical expressions using Boolean functions</p>
		<p>Ability to design various synchronous and asynchronous circuits.</p>
		<p>Ability to introduce asynchronous sequential circuits and PLDs</p>
		<p>Ability to introduce digital simulation for development of application oriented logic circuits.</p>

LOCAL NEEDS

REGIONAL NEEDS

NATIONAL NEEDS

GLOBAL NEEDS

19153C33	ELECTROMAGNETIC THEORY	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
19153C34	ELECTRICAL MACHINES – I	Ability to analyze the magnetic-circuits.
		Ability to acquire the knowledge in constructional details of transformers.
		Ability to understand the concepts of electromechanical energy conversion.
		Ability to acquire the knowledge in working principles of DC Generator.
		Ability to acquire the knowledge in working principles of DC Motor
		Ability to acquire the knowledge in various losses taking place in D.C. Machines
19153C35	ELECTRON DEVICES AND CIRCUITS	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.

LOCAL NEEDS

REGIONAL NEEDS

NATIONAL NEEDS

GLOBAL NEEDS

		Employ the acquired knowledge in design and analysis of oscillators
19153C36	POWER PLANT ENGINEERING	Explain the layout, construction and working of the components inside a thermal power plant.
		Explain the layout, construction and working of the components inside a Diesel, Gas and Combined cycle power plants.
		Explain the layout, construction and working of the components inside nuclear power plants.
		Explain the layout, construction and working of the components inside Renewable energy power plants
		Explain the applications of power plants while extend their knowledge to power plant economics and environmental hazards and estimate the costs of electrical energy production.
19153L37	ELECTRONICS LABORATORY	Ability to understand and analyse electronic circuits.
19153L38	ELECTRICAL MACHINES LABORATORY-I	Ability to understand and analyze DC Generator
		Ability to understand and analyze DC Motor
		Ability to understand and analyse Transformers.
19149C41C	NUMERICAL METHODS	Understand the basic concepts and techniques of solving algebraic and transcendental equations.
		Appreciate the numerical techniques of interpolation and error approximations in various intervals in real life situations.
		Apply the numerical techniques of differentiation and integration for engineering problems.
		Understand the knowledge of various techniques and methods for solving first and second order ordinary differential equations
		Solve the partial and ordinary differential equations with initial and boundary conditions by using certain techniques with engineering applications.

LOCAL NEEDS

REGIONAL NEEDS

NATIONAL NEEDS

GLOBAL NEEDS

19153C42	ELECTRICAL MACHINES – II	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.
19153C43	TRANSMISSION AND DISTRIBUTION	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.
19153C44	MEASUREMENTS AND INSTRUMENTATION	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

LOCAL NEEDS

REGIONAL NEEDS

NATIONAL NEEDS

GLOBAL NEEDS

		Ability to model and analyze electrical and electronic Instruments and understand the operational features of display Devices and Data Acquisition System.
19153C45	LINEAR INTEGRATED CIRCUITS AND APPLICATIONS	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.
19153C46	CONTROL SYSTEMS	Ability to develop various representations of system based on the knowledge of Mathematics, Science and Engineering fundamentals.
		Ability to do time domain and frequency domain analysis of various models of linear system
		Ability to interpret characteristics of the system to develop mathematical model.
		Ability to design appropriate compensator for the given specifications.
		Ability to come out with solution for complex control problem
		Ability to understand use of PID controller in closed loop system.
19153L47	ELECTRICAL MACHINES LABORATORY - II	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

LOCAL NEEDS

REGIONAL NEEDS

NATIONAL NEEDS

GLOBAL NEEDS

19153L48	LINEAR AND DIGITAL INTEGRATED CIRCUITS LABORATORY	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 TOTA
		Ability to Design and implement counters using specific counter IC.
19153C51	POWER SYSTEM ANALYSIS	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.
19153C52	MICROPROCESSORS AND MICROCONTROLLERS	Ability to acquire knowledge in Addressing modes & instruction set of 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.
		Ability to need & use of Interrupt structure 8085 & 8051.
19153C53	POWER ELECTRONICS	Ability to analyse AC-AC and DC-DC and DC-AC converters.
		Ability to choose the converters for real time applications.

LOCAL NEEDS

REGIONAL NEEDS

NATIONAL NEEDS

GLOBAL NEEDS

19150FE54 A	Database Management System	This course introduces the core principles and techniques required in the design and implementation of database systems.	
		This introductory application-oriented course covers the relational database systems RDBMS - the predominant system for business, scientific and engineering applications at present.	
		Ability to recognize current and possible future role of renewable energy sources.	
		It includes Entity-Relational model, Normalization, Relational model, Relational algebra, and data access queries as well as an introduction to SQL.	
		It also covers essential DBMS concepts such as: Transaction Processing, Concurrency Control and Recovery.	
		It also provides students with theoretical knowledge and practical skills in the use of databases and database management systems in information technology applications.	
19153C55	DIGITAL SIGNAL PROCESSING	Ability to understand the importance of Fourier transform, digital filters and DS Processors.	
		Ability to acquire knowledge on Signals and systems & their mathematical representation	
		Ability to understand and analyze the discrete time systems.	
		Ability to analyze the transformation techniques & their computation.	
		Ability to analyze the transformation techniques & their computation.	
		Ability to acquire knowledge on programmability digital signal processor & quantization effects.	
19153C56	OBJECT ORIENTED PROGRAMMING	Develop Java programs using OOP principles	
		Develop Java programs with the concepts inheritance and interfaces	
		Build Java applications using exceptions and I/O streams	
		Develop Java applications with threads and generics classes	
		Develop interactive Java programs using swings	
LOCAL NEEDS	REGIONAL NEEDS	NATIONAL NEEDS	GLOBAL NEEDS

19153L57	CONTROL AND INSTRUMENTATION LABORATORY	<p>Ability to understand control theory and apply them to electrical engineering problems.</p> <p>Ability to analyze the various types of converters</p> <p>Ability to design compensators</p> <p>Ability to understand the basic concepts of bridge networks.</p> <p>Ability to the basics of signal conditioning circuits</p> <p>Ability to study the simulation packages.</p>
19153L58	OBJECT ORIENTED PROGRAMMING LABORATORY	<p>Develop and implement Java programs with arraylist, exception handling and multithreading .</p> <p>Design applications using file processing, generic programming and event handling.</p>
19153L59	PROFESSIONAL COMMUNICATION	<p>Make effective presentations</p> <p>Participate confidently in Group Discussions</p> <p>Attend job interviews and be successful in them</p> <p>Develop adequate Soft Skills required for the workplace</p>
19153C61	SOLID STATE DRIVES	<p>Ability to understand and suggest a converter for solid state drive.</p> <p>Ability to select suitability drive for the given application</p> <p>Ability to study about the steady state operation and transient dynamics of a motor load system.</p> <p>Ability to analyze the operation of the converter/chopper fed dc drive</p>

LOCAL NEEDS

REGIONAL NEEDS

NATIONAL NEEDS

GLOBAL NEEDS

		Ability to analyze the operation and performance of AC motor drives
		Ability to analyze and design the current and speed controllers for a closed loop solid state DC motor drive.
19153C62	PROTECTION AND SWITCHGEAR	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.
		Ability to analyze the characteristics and functions of relays and protection schemes
		Ability to study about the apparatus protection, static and numerical relays.
		Ability to acquire knowledge on functioning of circuit breaker
19153C63		EMBEDDED SYSTEMS
	Ability to suggest an embedded system for a given application.	
	Ability to operate various Embedded Development Strategies	
	Ability to study about the bus Communication in processors.	
	Ability to acquire knowledge on various processor scheduling algorithms.	
	Ability to understand basics of Real time operating system.	
19153E64E	MODERN POWER CONVERTERS	
19153E65C	POWER QUALITY	Ability to understand various sources, causes and effects of power quality issues, electrical systems and their measures and mitigation.
		Ability to analyze the causes & Mitigation techniques of various PQ events.
		Ability to study about the various Active & Passive power filters.

LOCAL NEEDS

REGIONAL NEEDS

NATIONAL NEEDS

GLOBAL NEEDS

		<p>Ability to understand the concepts about Voltage and current distortions, harmonics.</p> <p>Ability to analyze and design the passive filters.</p> <p>Ability to acquire knowledge on compensation techniques.</p> <p>Ability to acquire knowledge on DVR.</p>
19153L66	POWER ELECTRONICS AND DRIVES LABORATORY	<p>Ability to practice and understand converter and inverter circuits and apply software for engineering problems</p> <p>Ability to experiment about switching characteristics various switches</p> <p>Ability to analyze about AC to DC converter circuits</p> <p>Ability to analyze about DC to AC circuits.</p> <p>Ability to acquire knowledge on AC to AC converters</p> <p>Ability to acquire knowledge on simulation software</p>
19153L67	MICROPROCESSORS AND MICROCONTROLLERS LABORATORY	<p>Ability to understand and apply computing platform and software for engineering problems</p> <p>Ability to programming logics for code conversion.</p> <p>Ability to acquire knowledge on A/D and D/A</p> <p>Ability to understand basics of serial communication</p> <p>Ability to understand and impart knowledge in DC and AC motor interfacing</p> <p>Ability to understand basics of software simulators.</p>
19153MP68	MINI PROJECT	<p>On Completion of the mini project work students will be in a position to take up their final year project work and find solution by formulating proper methodology.</p>
19153C71	HIGH VOLTAGE ENGINEERING	<p>Ability to understand Transients in power system</p> <p>Ability to understand Generation and measurement of high voltage</p>

LOCAL NEEDS

REGIONAL NEEDS

NATIONAL NEEDS

GLOBAL NEEDS

		Ability to understand High voltage testing.
		Ability to understand various types of over voltages in power system
		Ability to measure over voltages.
		Ability to test power apparatus and insulation coordination
19153C72	POWER SYSTEM OPERATION AND CONTROL	Ability to understand the day-to-day operation of electric power system.
		Ability to analyze the control actions to be implemented on the system to meet the minute to-minute variation of system demand.
		Ability to understand the significance of power system operation and control.
		Ability to acquire knowledge on real power-frequency interaction
		Ability to understand the reactive power-voltage interaction.
		Ability to design SCADA and its application for real time operation
19153C73	RENEWABLE ENERGY SYSTEMS	Ability to create awareness about renewable Energy Sources and technologies.
		Ability to get adequate inputs on a variety of issues in harnessing renewable Energy.
		Ability to recognize current and possible future role of renewable energy sources.
		Ability to explain the various renewable energy resources and technologies and their applications.
		Ability to understand basics about biomass energy
		Ability to acquire knowledge about solar energy.
19154FE74 B	TESTING OF MATERIALS	Identify suitable testing technique to inspect industrial component

LOCAL NEEDS

REGIONAL NEEDS

NATIONAL NEEDS

GLOBAL NEEDS

		ability to use the different technique and know its application and limitation
19153E75A	DISASTER MANAGEMENT	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.
		Draw the hazard and vulnerability profile of India, Scenarios in the Indian context, Disaster damage assessment and management.
19153E76F	TOTAL QUALITY MANAGEMENT	The student would be able to apply the tools and techniques of quality management to manufacturing and services processes.
19153L77	POWER SYSTEM SIMULATION LABORATORY	Ability to understand power system planning and operational studies.
		Ability to acquire knowledge on Formation of Bus Admittance and Impedance Matrices and Solution of Networks
		Ability to analyze the power flow using GS and NR method
		Ability to find Symmetric and Unsymmetrical fault
		Ability to understand the economic dispatch
		Ability to analyze the electromagnetic transients.
19153L78	RENEWABLE ENERGY SYSTEMS LABORATORY	Ability to understand and analyze Renewable energy systems.
		Ability to train the students in Renewable Energy Sources and technologies.
		Ability to provide adequate inputs on a variety of issues in harnessing Renewable Energy.
		Ability to simulate the various Renewable energy sources.
		Ability to recognize current and possible future role of Renewable energy sources
		Ability to understand basics of Intelligent Controllers.

LOCAL NEEDS

REGIONAL NEEDS

NATIONAL NEEDS

GLOBAL NEEDS

19153E81G	PRINCIPLES OF MANAGEMENT	Upon completion of the course, students will be able to have clear understanding of managerial functions like planning, organizing, staffing, leading & controlling and have same basic knowledge on international aspect of management
19153E82F	BIOMEDICAL INSTRUMENTATION	Ability to understand the philosophy of the heart, lung, blood circulation and respiration system.
		Ability to provide latest ideas on devices of non-electrical devices.
		Ability to gain knowledge on various sensing and measurement devices of electrical origin.
		Ability to understand the analysis systems of various organ types.
		Ability to bring out the important and modern methods of imaging techniques and their analysis.
		Ability to explain the medical assistance/techniques, robotic and therapeutic equipments.
19153P81	PROJECTWORK	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.

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

B.TECH - PART TIME (UG - 2017)

CO UR SE CO DE	COURSE TITLE	COURSE OUTCOMES
191 48S 11 P	TRANSFORMS AND PARTIAL DIFFERENTIAL EQUATIONS	<p>Understand how to solve the given standard partial differential equations.</p> <p>Solve differential equations using Fourier series analysis which plays a vital role in engineering applications.</p>

LOCAL NEEDS

REGIONAL NEEDS

NATIONAL NEEDS

GLOBAL NEEDS

		<p>Appreciate the physical significance of Fourier series techniques in solving one and two dimensional heat flow problems and one dimensional wave equations.</p> <hr/> <p>Understand the mathematical principles on transforms and partial differential equations would provide them the ability to formulate and solve some of the physical problems of engineering.</p> <hr/> <p>Use the effective mathematical tools for the solutions of partial differential equations by using Z transform techniques for discrete time systems.</p>
191 53 H1 2P	CONTROL SYSTEM	<p>To understand the methods of representation of systems and getting their transfer function models</p> <hr/> <p>To provide adequate knowledge in the time response of systems and steady state error analysis</p> <hr/> <p>To give basic knowledge is obtaining the open loop and closed-loop frequency responses of systems</p> <hr/> <p>To understand the concept of stability of control system and methods of stability analysis</p> <hr/> <p>To study the three ways of designing compensation for a control system</p>
191 53 H1 3P	CIRCUIT ANALYSIS AND NETWORKS	<p>To study about various network theorems and the method of application to analyse a circuit.</p> <hr/> <p>To know the concept of transfer function of a network and the nature of response to external inputs</p> <hr/> <p>To synthesize a network in different forms from the transfer function.</p> <hr/> <p>To know the concept and design of frequency selective filters.</p>
191 53	ELECTRONIC CIRCUITS	<p>To acquaint the students with construction, theory and characteristics of the following electronic devices</p>

LOCAL NEEDS

REGIONAL NEEDS

NATIONAL NEEDS

GLOBAL NEEDS

H1 4P		Bipolar transistor, Field Effect transistor, Multivibrators, Power control/regulator devices, Feedback amplifiers and oscillators
191 53 H1 5P	ELECTRICAL MACHINES - I	<p>To introduce the concept of rotating machines and the principle of electromechanical energy conversion in single and multiple excited systems.</p> <p>To understand the generation of D.C. voltages by using different type of generators and study their performance.</p> <p>To study the working principles of D.C. motors and their load characteristics, starting and methods of speed control.</p> <p>To familiarize with the constructional details of different type of transformers, working principle and their performance.</p> <p>To estimate the various losses taking place in D.C. machines and transformers and to study the different testing method to arrive at their performance.</p>
191 48S 21 P	NUMERICAL METHODS	<p>Apply the basic concepts of classifications of design of experiments in the field of agriculture.</p> <p>Appreciate the numerical techniques of interpolation in various intervals and apply the numerical techniques of differentiation and integration for engineering problems.</p> <p>Understand the knowledge of various techniques and methods for solving first and second order ordinary differential equations.</p> <p>Solve the partial and ordinary differential equations with initial and boundary conditions by using certain techniques with engineering applications</p>
171 50S 22 P	COMPUTER ARCHITECTURE	<p>Computer arithmetic and logic unit design.</p> <p>Input and output organizations and interfacing.</p> <p>Control Mechanism and CPU functioning.</p> <p>Pipeline architecture and vector processing.</p> <p>Various memories and their organization.</p>

LOCAL NEEDS

REGIONAL NEEDS

NATIONAL NEEDS

GLOBAL NEEDS

191 53 H2 3P	ELECTRICAL MACHINES-II	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.
191 53 H2 4P	DIGITAL ELECTRONICS	To study various number systems and to simplify the mathematical expressions using Boolean functions simple problems.
		To study implementation of combinational circuits
		To study the design of various synchronous and asynchronous circuits.
		To expose the students to various memory devices.
		To develop expression for computation of fundamental parameters of lines.
191 53 H2 5P	TRANSMISSION AND DISTRIBUTION	To categorize the lines into different classes and develop equivalent circuits for these classes.
		To analyze the voltage distribution in insulator strings and cables and methods to improve the same.
		To develop expression for computation of fundamental parameters of lines.
191 48S 31 P	PROBABILITY AND STATISTICS	To categorize the lines into different classes and develop equivalent circuits for these classes.
		To analyze the voltage distribution in insulator strings and cables and methods to improve the same.
		To study the IC fabrication procedure.
191 52S 32 P	ANALOG INTEGRATED CIRCUITS	To study characteristics; realize circuits; design for signal analysis using Op-amp Ics.
		To study the applications of Op-amp.

LOCAL NEEDS

REGIONAL NEEDS

NATIONAL NEEDS

GLOBAL NEEDS

		To study internal functional blocks and the applications of special ICs like Timers, PLL circuits, regulator Circuits, ADCs.
191 53 H3 3P	POWER ELECTRONICS	To get an overview of different types of power semiconductor devices and their switching characteristics.
		To understand the operation, characteristics and performance parameters of controlled rectifiers
		To study the operation, switching techniques and basic topologies of DC-DC switching regulators.
		To learn the different modulation techniques of pulse width modulated inverters and to understand harmonic reduction methods.
		To study the operation of AC voltage controller and Matrix converters.
191 53 H3 4P	MEASUREMENTS AND INSTRUMENTATION	Introduction to general instrument system, error, calibration etc.
		Emphasis is laid on analog and digital techniques used to measure voltage, current, energy and power etc.
		To have an adequate knowledge of comparison methods of measurement.
		Elaborate discussion about storage & display devices.
		Exposure to various transducers and data acquisition system.
191 53 L3 5P	MACHINES LAB	apply synchronous Motor
		apply Load test on three phase squirrel cage Induction motor
		apply Speed control of three phase slip ring Induction Motor
191 53 H4 1P	PROTECTION AND SWITCHGEAR	To expose the students to the various faults in power system and learn the various methods of protection scheme.
		To understand the current interruption in Power System and study the various switchgears
191 53	HIGH VOLTAGE	To study the performance of converters and modeling of DC line with controllers.

LOCAL NEEDS

REGIONAL NEEDS

NATIONAL NEEDS

GLOBAL NEEDS

H4 2P	DC TRANSMISSION	To study about converter harmonics and its mitigation using active and passive filters
191 53 H4 3P	SOLID STATE DRIVES	<p>To understand the stable steady-state operation and transient dynamics of a motor-load system.</p> <p>To study and analyze the operation of the converter / chopper fed dc drive and to solve simple problems.</p> <p>To study and understand the operation of both classical and modern induction motor drives.</p> <p>To understand the differences between synchronous motor drive and induction motor drive and to learn the basics of permanent magnet synchronous motor drives.</p> <p>To analyze and design the current and speed controllers for a closed loop solid-state d.c motor drive.</p>
191 53 E4 4C P	BIOMEDICAL INSTRUMENTATION	<p>To provide an acquaintance of the physiology of the heart, lung, blood circulation and circulation respiration. Methods of different transducers used.</p> <p>To introduce the student to the various sensing and measurement devices of electrical origin.</p> <p>To provide the latest ideas on devices of non-electrical devices.</p> <p>To bring out the important and modern methods of imaging techniques.</p> <p>To provide latest knowledge of medical assistance / techniques and therapeutic equipments</p>
191 53 L4 5P	CONTROL SYSTEM & MEASUREMENTS LAB	To provide a platform for understanding the basic concepts of linear control theory and its application to practical systems and To train the students in the measurement of displacement, resistance, inductance, torque and angle etc., and to give exposure to AC, DC bridges and transient measurement.

LOCAL NEEDS

REGIONAL NEEDS

NATIONAL NEEDS

GLOBAL NEEDS

191 53 H5 1P	POWER SYSTEM ANALYSIS	<p>To model steady-state operation of large-scale power systems and to solve the power flow problems using efficient numerical methods suitable for computer simulation.</p> <p>To model and analyse power systems under abnormal (fault) conditions.</p> <p>To model and analyse the dynamics of power system for small-signal and large signal disturbances and o design the systems for enhancing stability</p>
191 53 H5 2P	POWER QUALITY	<p>Ability to understand various sources, causes and effects of power quality issues, electrical systems and their measures and mitigation.</p> <p>Ability to analyze the causes & Mitigation techniques of various PQ events.</p> <p>Ability to study about the various Active & Passive power filters.</p> <p>Ability to understand the concepts about Voltage and current distortions, harmonics.</p> <p>Ability to analyze and design the passive filters.</p> <p>Ability to acquire knowledge on compensation techniques.</p> <p>Ability to acquire knowledge on DVR.</p>
191 53 H5 3P	SPECIAL ELECTRICAL MACHINES	<p>Construction, principle of operation and performance of synchronous reluctance motors.</p> <p>Construction, principle of operation and performance of stepping motors.</p> <p>Construction, principle of operation and performance of switched reluctance motors.</p> <p>Construction, principle of operation and performance of permanent magnet brushless D.C. motors.</p> <p>Construction, principle of operation and performance of permanent magnet synchronous motors</p>
191 58 E5	Environment al Science and Engineering	<p>Environmental Pollution or problems cannot be solved by mere laws. Public participation is an important aspect which serves the environmental Protection. One will obtain knowledge on the following after completing the course.</p>

LOCAL NEEDS

REGIONAL NEEDS

NATIONAL NEEDS

GLOBAL NEEDS

4A P		Public awareness of environmental is at infant stage.
		Ignorance and incomplete knowledge has lead to misconceptions
191 53 L5 5P	POWER ELECTRONICS & DRIVES LAB	Development and improvement in std. of living has lead to serious environmental disasters
191 53 H6 1P	UTILIZATION OF ELECTRICAL ENERGY	To ensure that the knowledge acquired is applied in various fields as per his job requirements. To orient the subject matter in the proper direction, visits to industrial establishments are recommended in order to familiarize with the new developments in different areas.
191 53 H6 2P	SOLID STATE RELAYS	Advantages of Static Relays Steady State and Transient Performance of Signal Driving Elements Static Relay Circuits for Generator Loss of Field
191 53 H6 3P	POWER SYSTEM OPERATION AND CONTROL	To get an overview of system operation and control. To understand & model power-frequency dynamics and to design power-frequency controller. To understand & model reactive power-voltage interaction and different methods of control for maintaining voltage profile against varying system load.
191 53 E6 4A P	Principles of Management	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
191 53 L6 5P	POWER SYSTEMS LAB	To simulate analysis and planning cases for a practical power system

LOCAL NEEDS

REGIONAL NEEDS

NATIONAL NEEDS

GLOBAL NEEDS

191 60S 71 P	TOTAL QUALITY MANAGEMENT	The student would be able to apply the tools and techniques of quality management to manufacturing and services processes.
191 53 H7 2P	ELECTRICAL MACHINE DESIGN	<p>Construction, principle of operation and performance of DC machine.</p> <p>Construction, operating Characteristics of single and three phase transformer.</p> <p>Design and operating characteristics of Induction motors.</p> <p>Construction, principle of operation, Design of synchronous machines and to have knowledge of machine design in CAD</p>
191 53 H7 3P	POWER PLANT ENGINEERING	<p>Explain the layout, construction and working of the components inside a thermal power plant.</p> <p>Explain the layout, construction and working of the components inside a Diesel, Gas and Combined cycle power plants.</p> <p>Explain the layout, construction and working of the components inside nuclear power plants.</p> <p>Explain the layout, construction and working of the components inside Renewable energy power plants</p> <p>Explain the applications of power plants while extend their knowledge to power plant economics and environmental hazards and estimate the costs of electrical energy production.</p>
191 53 E7 4A P	POWER SYSTEM TRANSIENTS	<p>To study the generation of switching transients and their control using circuit – theoretical concept.</p> <p>To study the mechanism of lightning strokes and the production of lightning surges.</p> <p>To study the propagation, reflection and refraction of travelling waves.</p> <p>To study the impact of voltage transients caused by faults, circuit breaker action, load rejection on integrated power system.</p>

LOCAL NEEDS

REGIONAL NEEDS

NATIONAL NEEDS

GLOBAL NEEDS

191
53
P7
5P

PROJECTWORK

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.

LOCAL NEEDS

REGIONAL NEEDS

NATIONAL NEEDS

GLOBAL NEEDS



SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

B.TECH - FULL TIME (UG - 2019)

COURSE CODE	COURSE TITLE	CO	COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	
19147S11	COMMUNICATIVE ENGLISH	CO1	Read articles of a general kind in magazines and newspapers.					✓								
		CO2	Participate effectively in informal conversations; introduce themselves and their friends and express opinions in English.											✓		
		CO3	Comprehend conversations and short talks delivered in English										✓			

		CO4	Write short essays of a general kind and personal letters and emails in English.														✓				
19148S12	ENGINEERING MATHEMATICS – I	CO1	Use both the limit definition and rules of differentiation to differentiate functions.																✓		
		CO2	Apply differentiation to solve maxima and minima problems.		✓																
		CO3	Evaluate integrals both by using Riemann sums and by using the Fundamental Theorem of Calculus.																		
		CO4	Apply integration to compute multiple integrals, area, volume, integrals in polar coordinates, in addition to change of order and change of variables.																✓		
		CO5	Evaluate integrals using techniques of integration, such as substitution, partial fractions and integration by parts.																		✓
		CO6	Determine convergence/divergence of improper integrals and evaluate convergent improper integrals.																		✓
		CO7	Apply various techniques in solving differential equations.																		✓

19149S13	ENGINEERING PHYSICS	CO1	the students will gain knowledge on the basics of properties of matter and its applications,						✓					
		CO2	the students will acquire knowledge on the concepts of waves and optical devices and their applications in fibre optics,		✓									
		CO3	the students will have adequate knowledge on the concepts of thermal properties of materials and their applications in expansion joints and heat exchangers,			✓								
		CO4	the students will get knowledge on advanced physics concepts of quantum theory and its applications in tunneling microscopes, and		✓								✓	
		CO5	the students will understand the basics of crystals, their structures and different crystal growth techniques.					✓						
19149S14	ENGINEERING CHEMISTRY	CO1	The knowledge gained on engineering materials, fuels, energy sources and water treatment techniques will facilitate better understanding of engineering processes and applications for further learning.								✓			
19154S15	ENGINEERING GRAPHICS	CO1	familiarize with the fundamentals and standards of Engineering graphics						✓					

		CO2	perform freehand sketching of basic geometrical constructions and multiple views of objects.			✓											
		CO3	project orthographic projections of lines and plane surfaces.											✓			
		CO4	draw projections and solids and development of surfaces.						✓								
		CO5	visualize and to project isometric and perspective sections of simple solids.			✓											
17150S16	PROBLEM SOLVING AND PYTHON PROGRAMMING	CO1	Develop algorithmic solutions to simple computational problems	✓													
		CO2	Read, write, execute by hand simple Python programs.		✓												
		CO3	Structure simple Python programs for solving problems.								✓						
		CO4	Decompose a Python program into functions.					✓									
		CO5	Represent compound data using Python lists, tuples, dictionaries.										✓				
		CO6	Read and write data from/to files in Python Programs.							✓							
19150L17	PROBLEM SOLVING AND PYTHON PROGRAMMING LABORATORY	CO1	Write, test, and debug simple Python programs.													✓	
		CO2	Implement Python programs with conditionals and loops.										✓				
		CO3	Develop Python programs step-wise by defining functions and calling them.								✓						

		CO4	Use Python lists, tuples, dictionaries for representing compound data.				✓										
		CO5	Read and write data from/to files in Python.					✓									
19150L18	PHYSICS AND CHEMISTRY LABORATORY	CO1	apply principles of elasticity, optics and thermal properties for engineering applications.	✓													
19147S21	TECHNICAL ENGLISH	CO1	Read technical texts and write area- specific texts effortlessly.												✓		
		CO2	Listen and comprehend lectures and talks in their area of specialisation successfully.										✓				
		CO3	Speak appropriately and effectively in varied formal and informal contexts.						✓								
		CO4	Write reports and winning job applications.			✓											
17148S22A	ENGINEERING MATHEMATICS – II	CO1	Eigen values and eigenvectors, diagonalization of a matrix, Symmetric matrices, Positive definite matrices and similar matrices.					✓								✓	
		CO2	Gradient, divergence and curl of a vector point function and related identities.										✓				

		CO3	Evaluation of line, surface and volume integrals using Gauss, Stokes and Green's theorems and their verification.		✓													
		CO4	Analytic functions, conformal mapping and complex integration.														✓	
		CO5	Laplace transform and inverse transform of simple functions, properties, various related theorems and application to differential equations with constant coefficients.								✓							
19148S22A	PHYSICS FOR ELECTRONICS ENGINEERING	CO1	gain knowledge on classical and quantum electron theories, and energy band structures,					✓										
		CO2	acquire knowledge on basics of semiconductor physics and its applications in various devices,															
		CO3	get knowledge on magnetic and dielectric properties of materials,															✓
		CO4	have the necessary understanding on the functioning of optical materials for optoelectronics,									✓						
		CO5	understand the basics of quantum structures and their applications in spintronics and carbon electronics.		✓													
19149S24A	ENVIRONMENTAL SCIENCE AND ENGINEERING	CO1	Environmental Pollution or problems cannot be solved by mere laws. Public participation is an important aspect which serves the environmental Protection. One will obtain knowledge on the following after completing the course.														✓	

		CO2	Public awareness of environmental is at infant stage.		✓												
		CO3	Ignorance and incomplete knowledge has lead to misconceptions									✓					
		CO4	Development and improvement in std. of living has lead to serious environmental disasters									✓					
19153S25C	CIRCUIT THEORY	CO1	Ability to analyse electrical circuits									✓					
		CO2	Ability to apply circuit theorems														
		CO3	Ability to analyse transients								✓						
19154S26C	BASIC CIVIL AND MECHANICAL ENGINEERING	CO1	appreciate the Civil and Mechanical Engineering components of Projects.				✓										
		CO2	explain the usage of construction material and proper selection of construction materials.														
		CO3	measure distances and area by surveying	✓													
		CO4	identify the components used in power plant cycle.				✓										
		CO5	demonstrate working principles of petrol and diesel engine.														✓
		CO6	elaborate the components of refrigeration and Air conditioning cycle.											✓			
19154L27	EngineeringPracticesLaboratory	CO1	fabricate carpentry components and pipe connections including plumbing works.									✓					
		CO2	use welding equipments to join the structures.						✓								
		CO3	Carry out the basic machining operations						✓								
		CO4	Make the models using sheet metal works						✓								

		C05	Illustrate on centrifugal pump, Air conditioner, operations of smithy, foundary and fittings									✓			
		C06	Carry out basic home electrical works and appliances					✓							
		C07	Measure the electrical quantities				✓								
		C08	Elaborate on the components, gates, soldering practices.			✓									
19153L28C	ELECTRIC CIRCUITS LABORATORY	C01	Understand and apply circuit theorems and concepts in engineering applications.	✓											
		C02	Simulate electric circuits.									✓			
19149S31C	TRANSFORMS AND PARTIAL DIFFERENTIAL EQUATIONS	C01	Understand how to solve the given standard partial differential equations.				✓								
		C02	Solve differential equations using Fourier series analysis which plays a vital role in engineering applications.									✓			
		C03	Appreciate the physical significance of Fourier series techniques in solving one and two dimensional heat flow problems and one dimensional wave equations.											✓	
		C04	Understand the mathematical principles on transforms and partial differential equations would provide them the ability to formulate and solve some of the physical problems of engineering.											✓	
		C05	Use the effective mathematical tools for the solutions of partial differential equations by using Z transform techniques for discrete time systems.										✓		

19153C32	DIGITAL LOGIC CIRCUITS	CO1	Ability to design combinational and sequential Circuits.			✓											
		CO2	Ability to simulate using software package.		✓												
		CO3	Ability to study various number systems and simplify the logical expressions using Boolean functions		✓												
		CO4	Ability to design various synchronous and asynchronous circuits.	✓													
		CO5	Ability to introduce asynchronous sequential circuits and PLDs	✓													
		CO6	Ability to introduce digital simulation for development of application oriented logic circuits.	✓													
19153C33	ELECTROMAGNETI C THEORY	CO1	Ability to understand the basic mathematical concepts related to electromagnetic vector fields.				✓										
		CO2	Ability to understand the basic concepts about electrostatic fields, electrical potential, energy density and their applications.									✓					
		CO3	Ability to acquire the knowledge in magneto static fields, magnetic flux density, vector potential and its applications.									✓					
		CO4	Ability to understand the different methods of emf generation and Maxwell's equations										✓				
		CO5	Ability to understand the basic concepts electromagnetic waves and characterizing parameters														✓

		CO6	Ability to understand and compute Electromagnetic fields and apply them for design and analysis of electrical equipment and systems		✓														
19153C34	ELECTRICAL MACHINES – I	CO1	Ability to analyze the magnetic-circuits.				✓												
		CO2	Ability to acquire the knowledge in constructional details of transformers.								✓								
		CO3	Ability to understand the concepts of electromechanical energy conversion.													✓			
		CO4	Ability to acquire the knowledge in working principles of DC Generator.				✓												
		CO5	Ability to acquire the knowledge in working principles of DC Motor															✓	
		CO6	Ability to acquire the knowledge in various losses taking place in D.C. Machines							✓									
19153C35	ELECTRON DEVICES AND CIRCUITS	CO1	Explain the structure and working operation of basic electronic devices.		✓														
		CO2	Able to identify and differentiate both active and passive elements				✓												
		CO3	Analyze the characteristics of different electronic devices such as diodes and transistors		✓													✓	
		CO4	Choose and adapt the required components to construct an amplifier circuit.						✓										
		CO5	Employ the acquired knowledge in design and analysis of oscillators										✓						

19153C36	POWER PLANT ENGINEERING	CO1	Explain the layout, construction and working of the components inside a thermal power plant.							✓							
		CO2	Explain the layout, construction and working of the components inside a Diesel, Gas and Combined cycle power plants.			✓											
		CO3	Explain the layout, construction and working of the components inside nuclear power plants.												✓		
		CO4	Explain the layout, construction and working of the components inside Renewable energy power plants						✓								
		CO5	Explain the applications of power plants while extend their knowledge to power plant economics and environmental hazards and estimate the costs of electrical energy production.			✓											
19153L37	ELECTRONICS LABORATORY	CO1	Ability to understand and analyse electronic circuits.	✓													
19153L38	ELECTRICAL MACHINES LABORATORY-I	CO1	Ability to understand and analyze DC Generator		✓												
		CO2	Ability to understand and analyze DC Motor							✓							
		CO3	Ability to understand and analyse Transformers.					✓									
19149C41C	NUMERICAL METHODS	CO1	Understand the basic concepts and techniques of solving algebraic and transcendental equations.										✓				
		CO2	Appreciate the numerical techniques of interpolation and error approximations in						✓								

			various intervals in real life situations.														
		CO3	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									✓					
		CO5	Solve the partial and ordinary differential equations with initial and boundary conditions by using certain techniques with engineering applications.							✓							
19153C42	ELECTRICAL MACHINES – II	CO1	Ability to understand the construction and working principle of Synchronous Generator				✓										
		CO2	Ability to understand MMF curves and armature windings.						✓								
		CO3	Ability to acquire knowledge on Synchronous motor.		✓												
		CO4	Ability to understand the construction and working principle of Three phase Induction Motor													✓	
		CO5	Ability to understand the construction and working principle of Special Machines											✓			
		CO6	Ability to predetermine the performance characteristics of Synchronous Machines.							✓							

19153C43	TRANSMISSION AND DISTRIBUTION	CO1	To understand the importance and the functioning of transmission line parameters.			✓								
		CO2	To understand the concepts of Lines and Insulators.					✓						✓
		CO3	To acquire knowledge on the performance of Transmission lines.								✓			
		CO4	To acquire knowledge on Underground Cabilities		✓									
		CO5	To become familiar with the function of different components used in Transmission and Distribution levels of power system and modelling of these components.											✓
19153C44	MEASUREMENTS AND INSTRUMENTATION	CO1	To acquire knowledge on Basic functional elements of instrumentation							✓				
		CO2	To understand the concepts of Fundamentals of electrical and electronic instruments					✓						
		CO3	Ability to compare between various measurement techniques											
		CO4	To acquire knowledge on Various storage and display devices											✓
		CO5	To understand the concepts Various transducers and the data acquisition systems								✓			
		CO6	Ability to model and analyze electrical and electronic Instruments and understand the operational features of display Devices and Data Acquisition System.		✓									
19153C45	LINEAR INTEGRATED	CO1	Ability to acquire knowledge in IC fabrication procedure				✓							

	CIRCUITS AND APPLICATIONS	CO2	Ability to analyze the characteristics of Op-Amp		✓												
		CO3	To understand the importance of Signal analysis using Op-amp based circuits.									✓					
		CO4	Functional blocks and the applications of special ICs like Timers, PLL circuits, regulator Circuits.														
		CO5	To understand and acquire knowledge on the Applications of Op-amp									✓					
		CO6	Ability to understand and analyse, linear integrated circuits their Fabrication and Application.									✓					
19153C46	CONTROL SYSTEMS	CO1	Ability to develop various representations of system based on the knowledge of Mathematics, Science and Engineering fundamentals.														
		CO2	Ability to do time domain and frequency domain analysis of various models of linear system								✓						
		CO3	Ability to interpret characteristics of the system to develop mathematical model.				✓										
		CO4	Ability to design appropriate compensator for the given specifications.														
		CO5	Ability to come out with solution for complex control problem	✓													
		CO6	Ability to understand use of PID controller in closed loop system.				✓										
19153L47	ELECTRICAL MACHINES LABORATORY - II	CO1	Ability to understand and analyze EMF and MMF methods														✓

		CO2	Ability to analyze the characteristics of V and Inverted V curves										✓		
		CO3	Ability to understand the importance of Synchronous machines									✓			
		CO4	Ability to understand the importance of Induction Machines						✓						
		CO5	Ability to acquire knowledge on separation of losses						✓						
19153L48	LINEAR AND DIGITAL INTEGRATED CIRCUITS LABORATORY	CO1	Ability to understand and implement Boolean Functions.						✓						
		CO2	Ability to understand the importance of code conversion												✓
		CO3	Ability to Design and implement 4-bit shift registers								✓				
		CO4	Ability to acquire knowledge on Application of Op-Amp TOTA					✓							
		CO5	Ability to Design and implement counters using specific counter IC.				✓								
19153C51	POWER SYSTEM ANALYSIS	CO1	Ability to model the power system under steady state operating condition	✓											
		CO2	Ability to understand and apply iterative techniques for power flow analysis										✓		
		CO3	Ability to model and carry out short circuit studies on power system				✓								
		CO4	Ability to model and analyze stability problems in power system										✓		

		CO5	Ability to acquire knowledge on Fault analysis.														✓		
		CO6	Ability to model and understand various power system components and carry out power flow, short circuit and stability studies.														✓		
19153C52	MICROPROCESSORS AND MICROCONTROLLERS	CO1	Ability to acquire knowledge in Addressing modes & instruction set of 8085 & 8051.										✓						
		CO2	Ability to understand the importance of Interfacing			✓													
		CO3	Ability to explain the architecture of Microprocessor and Microcontroller		✓														
		CO4	Ability to write the assembly language programme		✓														
		CO5	Ability to develop the Microprocessor and Microcontroller based applications.	✓															
		CO6	Ability to need & use of Interrupt structure 8085 & 8051.	✓															
19153C53	POWER ELECTRONICS	CO1	Ability to analyse AC-AC and DC-DC and DC-AC converters.	✓															
		CO2	Ability to choose the converters for real time applications.											✓					
19150FE54 A	RENEWABLE ENERGY SYSTEMS	CO1	Ability to create awareness about renewable Energy Sources and technologies.															✓	
		CO2	Ability to get adequate inputs on a variety of issues in harnessing renewable Energy.				✓												
		CO3	Ability to recognize current and possible future role of renewable energy sources.																

		C04	Ability to explain the various renewable energy resources and technologies and their applications.						✓								
		C05	Ability to understand basics about biomass energy.		✓												
		C06	Ability to acquire knowledge about solar energy.			✓											
19153C55	DIGITAL SIGNAL PROCESSING	C01	Ability to understand the importance of Fourier transform, digital filters and DS Processors.		✓										✓		
		C02	Ability to acquire knowledge on Signals and systems & their mathematical representation					✓									
		C03	Ability to understand and analyze the discrete time systems.									✓					
		C04	Ability to analyze the transformation techniques & their computation.							✓							
		C05	Ability to analyze the transformation techniques & their computation.				✓										
		C06	Ability to acquire knowledge on programmability digital signal processor & quantization effects.														✓
19153C56	OBJECT ORIENTED PROGRAMMING	C01	Develop Java programs using OOP principles						✓								
		C02	Develop Java programs with the concepts inheritance and interfaces				✓										
		C03	Build Java applications using exceptions and I/O streams	✓													
		C04	Develop Java applications with threads and generics classes		✓												

		CO5	Develop interactive Java programs using swings									✓					
19153L57	CONTROL AND INSTRUMENTATION LABORATORY	CO1	Ability to understand control theory and apply them to electrical engineering problems.					✓									
		CO2	Ability to analyze the various types of converters									✓					
		CO3	Ability to design compensators						✓								
		CO4	Ability to understand the basic concepts of bridge networks.													✓	
		CO5	Ability to the basics of signal conditioning circuits											✓			
		CO6	Ability to study the simulation packages.								✓						
		CO1	Develop and implement Java programs with arraylist, exception handling and multithreading .					✓									
19153L58	OBJECT ORIENTED PROGRAMMING LABORATORY	CO2	Design applications using file processing, generic programming and event handling.							✓							
		CO1	Make effective presentations		✓												
19153L59	PROFESSIONAL COMMUNICATION	CO2	Participate confidently in Group Discussions												✓		
		CO3	Attend job interviews and be successful in them										✓				

		CO4	Develop adequate Soft Skills required for the workplace							✓					
19153C61	SOLID STATE DRIVES	CO1	Ability to understand and suggest a converter for solid state drive.			✓									
		CO2	Ability to select suitability drive for the given application					✓							✓
		CO3	Ability to study about the steady state operation and transient dynamics of a motor load system.									✓			
		CO4	Ability to analyze the operation of the converter/chopper fed dc drive		✓										
		CO5	Ability to analyze the operation and performance of AC motor drives												✓
		CO6	Ability to analyze and design the current and speed controllers for a closed loop solid state DC motor drive.									✓			
		19153C62	PROTECTION AND SWITCHGEAR	CO1	Ability to understand and analyze Electromagnetic and Static Relays.					✓					
CO2	Ability to suggest suitability circuit breaker														

		CO3	Ability to find the causes of abnormal operating conditions of the apparatus and system.													✓	
		CO4	Ability to analyze the characteristics and functions of relays and protection schemes								✓						
		CO5	Ability to study about the apparatus protection, static and numerical relays.		✓												
		CO6	Ability to acquire knowledge on functioning of circuit breaker				✓										
19153C63	EMBEDDED SYSTEMS	CO1	Ability to understand and analyze Embedded systems.		✓												
		CO2	Ability to suggest an embedded system for a given application.										✓				
		CO3	Ability to operate various Embedded Development Strategies														
		CO4	Ability to study about the bus Communication in processors.											✓			
		CO5	Ability to acquire knowledge on various processor scheduling algorithms.												✓		
		CO6	Ability to understand basics of Real time operating system.														
19153E64E	MODERN POWER CONVERTERS	CO1	Ability to suggest converters for AC-DC conversion and SMPS								✓						
19153E65C	POWER QUALITY	CO1	Ability to understand various sources, causes and effects of power quality issues, electrical systems and their measures and mitigation.				✓										

		CO2	Ability to analyze the causes & Mitigation techniques of various PQ events.																
		CO3	Ability to study about the various Active & Passive power filters.	✓															
		CO4	Ability to understand the concepts about Voltage and current distortions, harmonics.				✓												
		CO5	Ability to analyze and design the passive filters.															✓	
		CO6	Ability to acquire knowledge on compensation techniques.															✓	
		CO7	Ability to acquire knowledge on DVR.											✓					
19153L66	POWER ELECTRONICS AND DRIVES LABORATORY	CO1	Ability to practice and understand converter and inverter circuits and apply software for engineering problems																
		CO2	Ability to experiment about switching characteristics various switches																
		CO3	Ability to analyze about AC to DC converter circuits																
		CO4	Ability to analyze about DC to AC circuits.																✓
		CO5	Ability to acquire knowledge on AC to AC converters																
		CO6	Ability to acquire knowledge on simulation software																
19153L67	MICROPROCESSORS AND MICROCONTROLLERS LABORATORY	CO1	Ability to understand and apply computing platform and software for engineering problems																
		CO2	Ability to programming logics for code conversion.	✓															
		CO3	Ability to acquire knowledge on A/D and D/A																✓

		CO4	Ability to understand basics of serial communication				✓										
		CO5	Ability to understand and impart knowledge in DC and AC motor interfacing									✓					
		CO6	Ability to understand basics of software simulators.												✓		
19153MP6 8	MINI PROJECT	CO1	On Completion of the mini project work students will be in a position to take up their final year project work and find solution by formulating proper methodology.												✓		
19153C71	HIGH VOLTAGE ENGINEERING	CO1	Ability to understand Transients in power system									✓					
		CO2	Ability to understand Generation and measurement of high voltage			✓											
		CO3	Ability to understand High voltage testing.		✓												
		CO4	Ability to understand various types of over voltages in power system		✓												
		CO5	Ability to measure over voltages.	✓													
		CO6	Ability to test power apparatus and insulation coordination	✓													
19153C72		CO1	Ability to understand the day-to-day operation of electric power system.	✓													

	POWER SYSTEM OPERATION AND CONTROL	CO2	Ability to analyze the control actions to be implemented on the system to meet the minute to-minute variation of system demand.						✓								
		CO3	Ability to understand the significance of power system operation and control.									✓					
		CO4	Ability to acquire knowledge on real power-frequency interaction									✓					
		CO5	Ability to understand the reactive power-voltage interaction.										✓				
		CO6	Ability to design SCADA and its application for real time operation													✓	
19153C73	RENEWABLE ENERGY SYSTEMS	CO1	Ability to create awareness about renewable Energy Sources and technologies.		✓												
		CO2	Ability to get adequate inputs on a variety of issues in harnessing renewable Energy.				✓										
		CO3	Ability to recognize current and possible future role of renewable energy sources.										✓				
		CO4	Ability to explain the various renewable energy resources and technologies and their applications.													✓	
		CO5	Ability to understand basics about biomass energy					✓									
		CO6	Ability to acquire knowledge about solar energy.														✓
19154FE74 B	TESTING OF MATERIALS	CO1	Identify suitable testing technique to inspect industrial component							✓							

		CO2	ability to use the different technique and know its application and limitation		✓										
19153E75A	DISASTER MANAGEMENT	CO1	Differentiate the types of disasters, causes and their impact on environment and society			✓									
		CO2	Assess vulnerability and various methods of risk reduction measures as well as mitigation.		✓									✓	
		CO3	Draw the hazard and vulnerability profile of India, Scenarios in the Indian context, Disaster damage assessment and management.					✓							
19153E76F	TOTAL QUALITY MANAGEMENT	CO1	The student would be able to apply the tools and techniques of quality management to manufacturing and services processes.								✓				
19153L77	POWER SYSTEM SIMULATION LABORATORY	CO1	Ability to understand power system planning and operational studies.							✓					
		CO2	Ability to acquire knowledge on Formation of Bus Admittance and Impedance Matrices and Solution of Networks			✓									
		CO3	Ability to analyze the power flow using GS and NR method											✓	
		CO4	Ability to find Symmetric and Unsymmetrical fault						✓						
		CO5	Ability to understand the economic dispatch			✓									
		CO6	Ability to analyze the electromagnetic transients.	✓											
19153L78		CO1	Ability to understand and analyze Renewable energy systems.		✓										

	RENEWABLE ENERGY SYSTEMS LABORATORY	CO2	Ability to train the students in Renewable Energy Sources and technologies.								✓					
		CO3	Ability to provide adequate inputs on a variety of issues in harnessing Renewable Energy.					✓								
		CO4	Ability to simulate the various Renewable energy sources.									✓				
		CO5	Ability to recognize current and possible future role of Renewable energy sources						✓							
		CO6	Ability to understand basics of Intelligent Controllers.													✓
19153E81G	PRINCIPLES OF MANAGEMENT	CO1	Upon completion of the course, students will be able to have clear understanding of managerial functions like planning, organizing, staffing, leading & controlling and have same basic knowledge on international aspect of management											✓		
19153E82F	BIOMEDICAL INSTRUMENTATION	CO1	Ability to understand the philosophy of the heart, lung, blood circulation and respiration system.							✓						
		CO2	Ability to provide latest ideas on devices of non-electrical devices.				✓									
		CO3	Ability to gain knowledge on various sensing and measurement devices of electrical origin.						✓							
		CO4	Ability to understand the analysis systems of various organ types.		✓											

		CO5	Ability to bring out the important and modern methods of imaging techniques and their analysis.														✓
		CO6	Ability to explain the medical assistance/techniques, robotic and therapeutic equipments.										✓				
19153P81	PROJECTWORK	CO1	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.						✓								

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

B.TECH - PART TIME (UG - 2019)

COURSE CODE	COURSE TITLE	CO	COURSE OUTCOMES	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO 12	
19148S11P	TRANSFORMS AND PARTIAL DIFFERENTIAL EQUATIONS	CO1	Understand how to solve the given standard partial differential equations.					✓								
		CO2	Solve differential equations using Fourier series analysis which plays a vital role in engineering applications.										✓			
		CO3	Appreciate the physical significance of Fourier series techniques in solving one and two dimensional heat flow problems and one dimensional wave equations.										✓			
		CO4	Understand the mathematical principles on transforms and partial differential equations would provide them the ability to formulate and solve some of the physical problems of engineering.											✓		

		CO5	Use the effective mathematical tools for the solutions of partial differential equations by using Z transform techniques for discrete time systems.													✓	
19153H12P	CONTROL SYSTEM	CO1	To understand the methods of representation of systems and getting their transfer function models		✓												
		CO2	To provide adequate knowledge in the time response of systems and steady state error analysis					✓									
		CO3	To give basic knowledge is obtaining the open loop and closed-loop frequency responses of systems											✓			
		CO4	To understand the concept of stability of control system and methods of stability analysis														✓
		CO5	To study the three ways of designing compensation for a control system					✓									
19153H13P	CIRCUIT ANALYSIS AND NETWORKS	CO1	To study about various network theorems and the method of application to analyse a circuit.													✓	
		CO2	To know the concept of transfer function of a network and the nature of response to external inputs						✓								
		CO3	To synthesize a network in different forms from the transfer function.		✓												
		CO4	To know the concept and design of frequency selective filters.			✓											

19153H14P	ELECTRONIC CIRCUITS	CO1	To acquaint the students with construction, theory and characteristics of the following electronic devices		✓									✓			
		CO2	Bipolar transistor, Field Effect transistor, Multivibrators, Power control/regulator devices, Feedback amplifiers and oscillators				✓										
19153H15P	ELECTRICAL MACHINES – I	CO1	To introduce the concept of rotating machines and the principle of electromechanical energy conversion in single and multiple excited systems.									✓					
		CO2	To understand the generation of D.C. voltages by using different type of generators and study their performance.							✓							
		CO3	To study the working principles of D.C. motors and their load characteristics, starting and methods of speed control.			✓											
		CO4	To familiarize with the constructional details of different type of transformers, working principle and their performance.													✓	
		CO5	To estimate the various losses taking place in D.C. machines and transformers and to study the different testing method to arrive at their performance.						✓								
19148S21P	NUMERICAL METHODS	CO1	Apply the basic concepts of classifications of design of experiments in the field of agriculture.			✓											

		CO2	Appreciate the numerical techniques of interpolation in various intervals and apply the numerical techniques of differentiation and integration for engineering problems.	✓														
		CO3	Understand the knowledge of various techniques and methods for solving first and second order ordinary differential equations.		✓													
		CO4	Solve the partial and ordinary differential equations with initial and boundary conditions by using certain techniques with engineering applications								✓							
19150S22P	COMPUTER ARCHITECTURE	CO1	Computer arithmetic and logic unit design.					✓										
		CO2	Input and output organizations and interfacing.									✓						
		CO3	Control Mechanism and CPU functioning.						✓									
		CO4	Pipeline architecture and vector processing.															✓
		CO5	Various memories and their organization.											✓				
19153H23P	ELECTRICAL MACHINES-II	CO1	Construction and performance of salient and non – salient type synchronous generators.							✓								
		CO2	Principle of operation and performance of synchronous motor.				✓											
		CO3	Construction, principle of operation and performance of induction machines.							✓								
		CO4	Starting and speed control of three-phase induction motors.		✓													
		CO5	Construction, principle of operation and performance of single phase induction motors and special machines.															✓

19153H24P	DIGITAL ELECTRONICS	CO1	To study various number systems and to simplify the mathematical expressions using Boolean functions simple problems.									✓			
		CO2	To study implementation of combinational circuits						✓						
		CO3	To study the design of various synchronous and asynchronous circuits.			✓									
		CO4	To expose the students to various memory devices.					✓							✓
17153H25P	TRANSMISSION AND DISTRIBUTION	CO1	To develop expression for computation of fundamental parameters of lines.									✓			
		CO2	To categorize the lines into different classes and develop equivalent circuits for these classes.		✓										
		CO3	To analyze the voltage distribution in insulator strings and cables and methods to improve the same.												✓
19148S31P	PROBABILITY AND STATISTICS	CO1	To develop expression for computation of fundamental parameters of lines.								✓				
		CO2	To categorize the lines into different classes and develop equivalent circuits for these classes.						✓						
		CO3	To analyze the voltage distribution in insulator strings and cables and methods to improve the same.												
19152S32P	ANALOG INTEGRATED CIRCUITS	CO1	To study the IC fabrication procedure.											✓	
		CO2	To study characteristics; realize circuits; design for signal analysis using Op-amp Ics.								✓				
		CO3	To study the applications of Op-amp.		✓										

		CO4	To study internal functional blocks and the applications of special Ics like Timers, PLL circuits, regulator Circuits, ADCs.				✓													
19153H33P	POWER ELECTRONICS	CO1	To get an overview of different types of power semiconductor devices and their switching characteristics.		✓															
		CO2	To understand the operation, characteristics and performance parameters of controlled rectifiers								✓									
		CO3	To study the operation, switching techniques and basics topologies of DC-DC switching regulators.																	
		CO4	To learn the different modulation techniques of pulse width modulated inverters and to understand harmonic reduction methods.									✓								
		CO5	To study the operation of AC voltage controller and Matrix converters.									✓								
19153H34P	MEASUREMENTS AND INSTRUMENTATION	CO1	Introduction to general instrument system, error, calibration etc.																	
		CO2	Emphasis is laid on analog and digital techniques used to measure voltage, current, energy and power etc.							✓										
		CO3	To have an adequate knowledge of comparison methods of measurement.				✓													
		CO4	Elaborate discussion about storage & display devices.																	
		CO5	Exposure to various transducers and data acquisition system.	✓																

19153L35P	MACHINES LAB	CO1	apply synchronous Motor				✓										
		CO2	apply Load test on three phase squirrel cage Induction motor													✓	
		CO3	applySpeed control of three phase slip ring Induction Motor										✓				
19153H41P	PROTECTION AND SWITCHGEAR	CO1	To expose the students to the various faults in power system and learn the various methods of protection scheme.									✓					
		CO2	To understand the current interruption in Power System and study the various switchgears						✓								
19153H42P	HIGH VOLTAGE DC TRANSMISSION	CO1	To study the performance of converters and modeling of DC line with controllers.														
		CO2	To study about converter harmonics and its mitigation using active and passive filters							✓							
19153H43P	SOLID STATE DRIVES	CO1	To understand the stable steady-state operation and transient dynamics of a motor-load system.												✓		
		CO2	To study and analyze the operation of the converter / chopper fed dc drive and to solve simple problems.									✓					
		CO3	To study and understand the operation of both classical and modern induction motor drives.							✓							
		CO4	To understand the differences between synchronous motor drive and induction motor drive and to learn the basics of permanent magnet synchronous motor drives.													✓	

		CO5	To analyze and design the current and speed controllers for a closed loop solid-state d.c motor drive.	✓												
19153E44C P	BIOMEDICAL INSTRUMENTATION	CO1	To provide an acquaintance of the physiology of the heart, lung, blood circulation and circulation respiration. Methods of different transducers used.									✓				
		CO2	To introduce the student to the various sensing and measurement devices of electrical origin.			✓										
		CO3	To provide the latest ideas on devices of non-electrical devices.										✓			
		CO4	To bring out the important and modern methods of imaging techniques.													✓
		CO5	To provide latest knowledge of medical assistance / techniques and therapeutic equipments												✓	
19153L45P	CONTROL SYSTEM & MEASUREMENTS LAB	CO1	To provide a platform for understanding the basic concepts of linear control theory and its application to practical systems and To train the students in the measurement of displacement, resistance, inductance, torque and angle etc., and to give exposure to AC, DC bridges and transient measurement.									✓				
19153H51P	POWER SYSTEM ANALYSIS	CO1	To model steady-state operation of large-scale power systems and to solve the power flow problems using efficient numerical methods suitable for computer simulation.			✓										

		CO2	To model and analyse power systems under abnormal (fault) conditions.		✓														
		CO3	To model and analyse the dynamics of power system for small-signal and large signal disturbances and o design the systems for enhancing stability		✓														
17153H52P	POWER QUALITY	CO1	Ability to understand various sources, causes and effects of power quality issues, electrical systems and their measures and mitigation.	✓															
		CO2	Ability to analyze the causes & Mitigation techniques of various PQ events.	✓															
		CO3	Ability to study about the various Active & Passive power filters.	✓															
		CO4	Ability to understand the concepts about Voltage and current distortions, harmonics.					✓											
		CO5	Ability to analyze and design the passive filters.											✓					
		CO6	Ability to acquire knowledge on compensation techniques.											✓					
		CO7	Ability to acquire knowledge on DVR.												✓				
19153H53P	SPECIAL ELECTRICAL MACHINES	CO1	Construction, principle of operation and performance of synchronous reluctance motors.															✓	
		CO2	Construction, principle of operation and performance of stepping motors.		✓														
		CO3	Construction, principle of operation and performance of switched reluctance motors.				✓												

		CO4	Construction, principle of operation and performance of permanent magnet brushless D.C. motors.									✓		
		CO5	Construction, principle of operation and performance of permanent magnet synchronous motors										✓	
19158E54A P	ENVIRONMENTAL SCIENCE AND ENGINEERING	CO1	Environmental Pollution or problems cannot be solved by mere laws. Public participation is an important aspect which serves the environmental Protection. One will obtain knowledge on the following after completing the course.				✓							
		CO2	Public awareness of environmental is at infant stage.									✓		
		CO3	Ignorance and incomplete knowledge has lead to misconceptions											✓
19153L55P	POWER ELECTRONICS & DRIVES LAB	CO1	Development and improvement in std. of living has lead to serious environmental disasters										✓	
19153H61P	UTILIZATION OF ELECTRICAL ENERGY	CO1	To ensure that the knowledge acquired is applied in various fields as per his job requirements.				✓							
		CO2	To orient the subject matter in the proper direction, visits to industrial establishments are recommended in order to familiarize with the new developments in different areas.									✓		
19153H62P		CO1	Advantages of Static Relays											✓

	SOLID STATE RELAYS	CO2	Steady State and Transient Performance of Signal Driving Elements														✓		
		CO3	Static Relay Circuits for Generator Loss of Field						✓										
19153H63P	POWER SYSTEM OPERATION AND CONTROL	CO1	To get an overview of system operation and control.			✓													
		CO2	To understand & model power-frequency dynamics and to design power-frequency controller.	✓															
		CO3	To understand & model reactive power-voltage interaction and different methods of control for maintaining voltage profile against varying system load.			✓													
19160E64A P	PRINCIPLES OF MANAGEMENT	CO1	Upon completion of the course, students will be able to have clear understanding of managerial functions like planning, organizing, staffing, leading & controlling and have same basic knowledge on international aspect of management											✓					
19153L65P	POWER SYSTEMS LAB	CO1	To simulate analysis and planning cases for a practical power system					✓											
19160S71P	TOTAL QUALITY MANAGEMENT	CO1	The student would be able to apply the tools and techniques of quality management to manufacturing and services processes.											✓					
19153H72P	ELECTRICAL MACHINE DESIGN	CO1	Construction, principle of operation and performance of DC machine.						✓										
		CO2	Construction, operating Characteristics of single and three phase transformer.																✓

		CO3	Design and operating characteristics of Induction motors.											✓			
		CO4	Construction, principle of operation, Design of synchronous machines and to have knowledge of machine design in CAD							✓							
19153H73P	POWER PLANT ENGINEERING	CO1	Explain the layout, construction and working of the components inside a thermal power plant.				✓										
		CO2	Explain the layout, construction and working of the components inside a Diesel, Gas and Combined cycle power plants.						✓								
		CO3	Explain the layout, construction and working of the components inside nuclear power plants.		✓												
		CO4	Explain the layout, construction and working of the components inside Renewable energy power plants														✓
		CO5	Explain the applications of power plants while extend their knowledge to power plant economics and environmental hazards and estimate the costs of electrical energy production.												✓		
19153E74A P	POWER SYSTEM TRANSIENTS	CO1	To study the generation of switching transients and their control using circuit – theoretical concept.						✓								
		CO2	To study the mechanism of lightning strokes and the production of lightning surges.		✓												
		CO3	To study the propagation, reflection and refraction of travelling waves.														✓

		CO2	State-space models, Transition matrix properties, Minimal realization, Controllability, Observability.			✓												
		CO3	Internal Stability, Lyapunov Stability theorems for linear systems, Linear Feedback and Observers, Separation Principle.		✓													
19272C13	POWER SYSTEM MODELLING AND ANALYSIS	CO1	To review Deep concepts of Power System in the field of Power System.		✓													
		CO2	To address the underlying concepts and methods behind Advanced Power System	✓														
		CO3	To impart knowledge of advancement in the field of power system with insight experimental approach.	✓														
19272C14	ECONOMIC OPERATIONS OF POWER SYSTEMS-I	CO1	This course also introduces optimization methods and their application in practical power system operation problems.	✓														
		CO2	This course provides application of modern numerical techniques and analytical methods for dealing with and solving operation-related problems in electric power systems.							✓								

19272C21	EHV POWER TRANSMISSION	CO1 Students would be introduced to the issues in designing power transmission lines operating at EHV/UHV voltages especially about insulation design, corona losses, audible noise , insulation co-ordination, electric field under the lines, issues due to mechanical vibrations of overhead power transmission lines and their mitigation etc.				✓								
19272C22	ECONOMIC OPERATIONS OF POWER SYSTEMS-II	CO1 This course also introduces optimization methods and their application in practical power system operation problems.											✓	
		CO2 This course provides application of modern numerical techniques and analytical methods for dealing with and solving operation-related problems in electric power systems.					✓							
		CO3 The primary objective of this course is to analyze efficient and optimum operation of electric power generation system and to provide an overview about the control techniques adopted to ensure the economic operation of a power system.	✓											
19272C23	POWER SYSTEM PROTECTION	CO1 Discuss performance of protective relays, components of protection scheme and relay terminology over current protection.		✓										
		CO2 Explain the working of distance relays and the effects of arc resistance, power swings, line length and source impedance on performance of distance relays.	✓									✓		

		CO3 Discuss pilot protection, construction, operating principles and performance of differential relays and discuss protection of generators, motors, transformer and Bus Zone Protection.							✓					
		CO4 Explain the construction and operation of different types of circuit breakers.								✓				
		CO5 Outline features of fuse, causes of overvoltages and its protection, also modern trends in Power System Protection.						✓						
19272E24B	POWER SYSTEM PLANNING AND RELIABILITY	CO1 Discuss primary components of power system planning, planning methodology for optimum power system expansion, various types of generation, transmission and distribution.		✓										
		CO2 Show knowledge of forecasting of future load requirements of both demand and energy by deterministic and statistical techniques using forecasting tools.										✓		
		CO3 Discuss methods to mobilize resources to meet the investment requirement for the power sector					✓							
		CO4 Understand economic appraisal to allocate the resources efficiently and appreciate the investment decisions		✓										
		CO5 Discuss expansion of power generation and planning for system energy in the country, evaluation of operating states of transmission system, their associated contingencies and the stability of the system.	✓											

		CO6	Discuss principles of distribution planning, supply rules, network development and the system studies		✓													
		CO7	Discuss reliability criteria for generation, transmission, distribution and reliability evaluation and analysis, grid reliability, voltage disturbances and their remedies							✓								
		CO8	Discuss planning and implementation of electric –utility activities, market principles and the norms framed by CERC for online trading and exchange in the interstate power market.					✓										
19272E25A	WIND ENERGY CONVERSION SYSTEMS	CO1	Explain the basics of solar energy conversion systems.									✓						
		CO2	Design a standalone PV system.						✓									
		CO3	Describe different wind energy conversion systems.															✓
19272L26	POWER SYSTEM SIMULATION LAB – II	CO1	To provide better understanding of power system analysis through digital simulation.													✓		
19272C31	ELECTRICAL TRANSIENTS IN POWER SYSTEMS	CO1	A quantitative foundation of the mechanism of lightning strokes and the production of lightning surges to understand how the various types of Transients in the system produced.							✓								
		CO2	Obtain the theoretic basis of the propagation, reflection and refraction of travelling waves for modeling of transmission line travelling waves														✓	

		CO3	Grasp the concepts of the impact of voltage transients caused by circuit breaker action, switching on integrated power system.							✓								
		CO4	Design of Insulations under the presence of transients and protection of power system against transient over voltages.		✓													
19272C32A	POWER ELECTRONICS APPLICATIONS IN POWER SYSTEMS	CO1	To understand basic power electronic devices and their role in power conversion														✓	
		CO2	To study basic topologies of various converter											✓				
19272E33A	POWER CONDITIONING	CO1	Reliably identify the sources of various power quality problems.							✓								
		CO2	Explain about causes of harmonic and its distortion effect.									✓						
		CO3	Estimate the impact of various power quality problems on appliances.				✓											
		CO4	Educate the harmful effects of poor power quality and harmonics.								✓							
		CO5	Decide the compensators and filters to keep the power quality indices within the standards.		✓													
19272E34A	SOFTWARE FOR CONTROL SYSTEM DESIGN	CO1	Used for problem-solving and control system design														✓	
		CO2	Used for modeling plant dynamics, designing control algorithms, and running closed-loop simulations					✓										

19272P35	PROJECT WORK PHASE-I	CO1	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.							✓					
19272P44	PROJECT WORK PHASE-II	CO1	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.	✓											

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

M.TECH (POWER SYSTEM) - PART TIME (PG - 2019)

COURSE CODE	COURSE TITLE	CO	COURSE OUTCOMES	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO 12	
19248S11D P	APPLIED MATHEMATICS FOR ELECTRICAL & ELECTRONICS ENGINEERING	CO1	Understand Finite differences, interpolation techniques, Numerical differentiation and Integration and apply it to various practical problems										✓			
		CO2	Apply Numerical methods to solve first order ordinary differential equations and Algebraic and Transcendental equations				✓									
		CO3	Illustrate Laplace transform and its application in different fields											✓		
		CO4	Apply Fourier transforms and its applications to solve Ordinary and Partial differential equations													✓
		CO5	Use Z-transform and its applications to solve difference equations												✓	

19272C12P	SYSTEM THEORY	CO1	Basics of linear theory/linear algebra										✓					
		CO2	State-space models, Transition matrix properties, Minimal realization, Controllability, Observability.															
		CO3	Internal Stability, Lyapunov Stability theorems for linear systems, Linear Feedback and Observers, Separation Principle.															
19272C13P	POWER SYSTEM MODELLING AND ANALYSIS	CO1	To review Deep concepts of Power System in the field of Power System.															
		CO2	To address the underlying concepts and methods behind Advanced Power System	✓														
		CO3	To impart knowledge of advancement in the field of power system with insight experimental approach.	✓														
19272L14P	POWER SYSTEM SIMULATION LAB – I	CO1	Formation of Y bus, Z bus, line parameters and modeling of transmission lines.	✓														
		CO2	Power flow analysis: Gauss – Seidel Method.						✓									
		CO3	Power flow analysis: Newton Raphson method.															✓
		CO4	Plain Decoupled and Fast Decoupled methods.													✓		
19272C21P	EHV POWER TRANSMISSION	CO1	Students would be introduced to the issues in designing power transmission lines operating at EHV/UHV voltages especially about insulation design, corona losses, audible noise , insulation co-ordination, electric field under the lines, issues due to mechanical vibrations of overhead power transmission lines and their mitigation etc.													✓		

19272C22P	POWER SYSTEM PROTECTION	<p>CO1 Discuss pilot protection, construction, operating principles and performance of differential relays and discuss protection of generators, motors, transformer and Bus Zone Protection.</p>													✓
		<p>CO2 Explain the construction and operation of different types of circuit breakers.</p>			✓										
		<p>CO3 Outline features of fuse, causes of overvoltages and its protection, also modern trends in Power System Protection.</p>				✓									
19272E23BP	POWER SYSTEM PLANNING AND RELIABILITY	<p>CO1 Discuss primary components of power system planning, planning methodology for optimum power system expansion, various types of generation, transmission and distribution.</p>										✓			
		<p>CO2 Show knowledge of forecasting of future load requirements of both demand and energy by deterministic and statistical techniques using forecasting tools.</p>												✓	
		<p>CO3 Discuss methods to mobilize resources to meet the investment requirement for the power sector</p>				✓									
		<p>CO4 Understand economic appraisal to allocate the resources efficiently and appreciate the investment decisions</p>												✓	
		<p>CO5 Discuss expansion of power generation and planning for system energy in the country, evaluation of operating states of transmission system, their associated contingencies and the stability of the system.</p>								✓					

		C06	Discuss principles of distribution planning, supply rules, network development and the system studies		✓														
		C07	Discuss reliability criteria for generation, transmission, distribution and reliability evaluation and analysis, grid reliability, voltage disturbances and their remedies			✓													
		C08	Discuss planning and implementation of electric –utility activities, market principles and the norms framed by CERC for online trading and exchange in the interstate power market.		✓													✓	
19272C31P	ECONOMIC OPERATIONS OF POWER SYSTEMS-I	C01	This course also introduces optimization methods and their application in practical power system operation problems.					✓											
		C02	This course provides application of modern numerical techniques and analytical methods for dealing with and solving operation-related problems in electric power systems.								✓								
		C03	The primary objective of this course is to analyze efficient and optimum operation of electric power generation system and to provide an overview about the control techniques adopted to ensure the economic operation of a power system.									✓							
19272C32P	HIGH VOLTAGE DIRECT CURRENT	C01	In early invention of electric energy, dc power was used but due to limitations of low voltage dc systems, ac systems become popular.			✓													

	TRANSMISSION SYSTEM	CO2	the factors such as are reactive power, stability, power control, etc, impose limitations on the amount of power to be transmitted over ac lines.															✓
		CO3	There are still several limitations of HVDC transmission. Therefore, the transmission system is mixed of HVAC and HVDC systems						✓									
19272E33A P	ANALYSIS OF INVERTERS	CO1	To provide the electrical circuit concepts behind the different working modes of inverters so as to enable deep understanding of their operation.			✓												
		CO2	To equip with required skills to derive the criteria for the design of inverters for UPS, drives etc.,	✓														
		CO3	To analyse and comprehend the various operating modes of different configuration of inverters.		✓													
19272L34P	POWER SYSTEM SIMULATION LAB – II	CO1	To provide better understanding of power system analysis through digital simulation.									✓						
19272C41P	ECONOMIC OPERATIONS OF POWER SYSTEMS-II	CO1	This course also introduces optimization methods and their application in practical power system operation problems.						✓									
		CO2	This course provides application of modern numerical techniques and analytical methods for dealing with and solving operation-related problems in electric power systems.															✓

		CO3	The primary objective of this course is to analyze efficient and optimum operation of electric power generation system and to provide an overview about the control techniques adopted to ensure the economic operation of a power system.							✓						
19272C42P	ELECTRICAL TRANSIENTS IN POWER SYSTEMS	CO1	A quantitative foundation of the mechanism of lightning strokes and the production of lightning surges to understand how the various types of Transients in the system produced.												✓	
		CO2	Obtain the theoretic basis of the propagation, reflection and refraction of travelling waves for modeling of transmission line travelling waves									✓				
		CO3	Grasp the concepts of the impact of voltage transients caused by circuit breaker action, switching on integrated power system.								✓					
		CO4	Design of Insulations under the presence of transients and protection of power system against transient over voltages.				✓									
19272E43A P	WIND ENERGY CONVERSION SYSTEMS	CO1	Explain the basics of solar energy conversion systems.							✓						
		CO2	Design a standalone PV system.		✓											
		CO3	Describe different wind energy conversion systems.													✓

19272P44P	PROJECT WORK PHASE-I	CO1	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.									✓			
19272E53A P	SOFTWARE FOR CONTROL SYSTEM DESIGN	CO1	Used for problem-solving and control system design						✓						
		CO2	Used for modeling plant dynamics, designing control algorithms, and running closed-loop simulations							✓					
19272E52A P	POWER CONDITIONING	CO1	Reliably identify the sources of various power quality problems.			✓									
		CO2	Explain about causes of harmonic and its distortion effect.						✓						
		CO3	Estimate the impact of various power quality problems on appliances.		✓										
		CO4	Educate the harmful effects of poor power quality and harmonics.							✓					
		CO5	Decide the compensators and filters to keep the power quality indices within the standards.				✓								
19272E51B P	POWER SYSTEM DYNAMICS	CO1	This course first introduces a student to power stability problems and the basic concepts of modeling and analysis of dynamical systems.						✓						
		CO2	Modeling of power system components - generators, transmission lines, excitation and prime mover controllers	✓											

		CO3	Stability of single machine and multi-machine systems is analyzed using digital simulation and small-signal analysis techniques.														
		CO4	The impact of stability problems on power system planning, and operation is also brought out.				✓										
19272P61P	PROJECT WORK PHASE-II	CO1	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.														



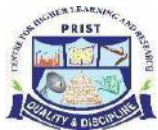
PRIST
DEEMED TO BE
UNIVERSITY
NAAC ACCREDITED
THANJAVUR – 613 403 - TAMILNADU

SCHOOL OF COMEMRCE AND MANAGEMENT

DEPARTMENT OF COMMERCE

1.1.1 -Curricula developed and implemented have relevance to the local, national, regional and global developmental needs which is reflected in Programme outcomes (POs), Programme Specific Outcomes (PSOs) and Course Outcomes (COs) of the Programmes

Local	
Global	
National	
Regional	



Criterion I – Curricular Aspects

2019

Program Outcomes and Course outcomes of

Department of Commerce

Programme offered:

S.No	Programme Name	PO and CO
1.	B.Com	Yes
2.	B.Com CA	Yes
3	M.Com	Yes
4.	M.Phil	Yes

B.Com

PROGRAMME OUTCOMES	
PO1	To train them to communicate commerce by improving their English vocabulary, Speak, read, write and listen clearly in person and through electronic media in English and in one Indian language, and make meaning of the world by connecting people, ideas, books, media and technology.
PO2	Recognize different value systems including your own, understand the moral dimensions of your decisions, and accept responsibility for them.
PO3	Elicit views of others, mediate disagreements and help reach conclusions in group settings. Demonstrate empathetic social concern and equity centered national development, and the ability to act with an informed awareness of issues and participate in civic life through volunteering.
PO4	The commerce and finance focused curriculum offers a number of specializations and practical exposures which would equip the student to face the modern-day challenges in commerce and business.
PO5	The all-inclusive outlook of the course offer a number of values based and job oriented courses ensures that students are trained into up-to-date. In advanced accounting courses beyond the introductory level, affective development will also progress to the valuing and organization levels.

PO6	This program could provide Industries, Banking Sectors, Insurance Companies, Financing companies, Transport Agencies, Warehousing etc., well trained professionals to meet the requirements.
PROGRAM SPECIFIC OUTCOME	
PSO1	To build a strong foundation of knowledge in different areas of Commerce.
PSO2	To develop the skill of applying concepts and techniques used in Commerce.
PSO3	To develop an attitude for working effectively and efficiently in a business environment.
PSO4	To integrate knowledge, skill and attitude that will sustain an environment of learning and creativity among the students.
PROGRAM EDUCATIONAL OBJECTIVES	
PEO1	To be capable of making a positive contribution to the accountancy in public practices, Govt commerce and industry
PEO2	To be able to pursue research in their chosen field of marketing, finance and HR.
PEO3	To be able to demonstrate team spirits, skills and values continue to learn and adapt to change throughout their professional career
PEO4	Possess wide spectrum of managerial skills along with competency building qualities in specific areas of business studies.
PEO5	Excel in contemporary knowledge of business and developing inclination towards lifelong learning

Course outcomes (Cos)

B.Com

S.No	Semester	Course Code/Name	Course Outcome
19110AEC11	I	Tamil I	<ul style="list-style-type: none"> ➤ Learn the changes occurred in literature since classical period. ➤ Make use of vocabulary systematically. ➤ Understand how to lead one's life realizing the modernity and its environment/atmosphere.
19111AEC11	I	Advanced English-I	<ul style="list-style-type: none"> ➤ Develop vocabulary ➤ Read and comprehend literature ➤ Learn to edit and do proof reading

19161SEC12	I	English-I	<ul style="list-style-type: none"> ➤ Read and comprehend literature ➤ Appreciate poetry and prose ➤ Familiarize students with fiction.
19161SEC13	I	Basic Accounting	<ul style="list-style-type: none"> ➤ Understanding the fundamental of financial accounting ➤ Develop the modern market economy ➤ Prepare the different kinds of financial statement ➤ Acquire conceptual knowledge of basics of accounting ➤ Identify and analyze the reasons for the difference between cash book and pass book balances ➤ Develop the skill of recording financial transactions and preparation of reports in accordance with GAAP
19161AEC14	I	Business Environment	<ul style="list-style-type: none"> ➤ Discuss the supply and demand theory and its impact on insurance ➤ Outline an how entity operate in the Business environment ➤ Explain the legal frame work that regulate the insurance industry ➤ Understand relationship between environment and business; Applying the environmental analysis techniques in practice ➤ Understand Economic, Socio-Cultural and Technological Environment ➤ Know state policies Economic legislations and Economic reforms laid by the government

19161AEC15	I	Marketing	<ul style="list-style-type: none"> ➤ Understand fundamental marketing concepts, theories and principles in areas of marketing policy ➤ Apply the knowledge, concepts, tools necessary to understand challenges ➤ Understand the marketing concepts and its evolution ➤ Analyze the market based on segmentation, targeting and positioning ➤ Know the consumer behavior and their decision making process ➤ Understand the rural markets and the contemporary issues in marketing ➤ Make decisions on product, price, promotion mix and distribution ➤ The course helped the students to know the principles and Practices of Marketing Mix and Marketing Research.
19161AEC16	I	Business Economics	<ul style="list-style-type: none"> ➤ Apply the concept of opportunity cost. ➤ Understand the concepts of cost, nature of production and its relationship to Business operations. ➤ Apply Economic theories to business decision ➤ Use the theoretical concept of demand and supply analysis in practice ➤ Understand the cost concepts, theories of profit and business cycles ➤ Use different demand forecasting techniques and apply different pricing techniques in business ➤ Understand the importance of Fiscal policy

19120SEC01AL.	I	Package Lab-I	<ul style="list-style-type: none"> ➤ Recognize when to use each of the Microsoft Office programs to create professional and academic documents. ➤ Use Microsoft Office programs to create personal, academic and business documents following current professional and/or industry standards. ➤ Apply skills and concepts for basic use of computer hardware, software, networks, and the Internet in the workplace and in future coursework as identified by the internationally accepted Internet and Computing Core (IC3) standards.
19111SEC01L	I	Communicative English Lab-I	<ul style="list-style-type: none"> ➤ Learn grammar.. ➤ Develop listening skill ➤ Enrich vocabulary ➤ Understand the process of communication ➤ Develop listening skill
1911INDCONS	I	Indian Constitution	<ul style="list-style-type: none"> ➤ Democratic values and citizenship Training are gained. ➤ Awareness on Fundamental Rights are established. ➤ Learn the functions of union and State Governments ➤ Learn the power and functions of the Judiciary ➤ Appreciate of Democratic Parliamentary Rule
19110AEC21	II	Tamil II	<ul style="list-style-type: none"> ➤ Know what devotion really is. ➤ Know the fruitfulness obtained through devotion. ➤ Perceive the progress achieved in the society through devotion.
19111AEC21	II	Advanced English-II	<ul style="list-style-type: none"> ➤ Develop technological skill. ➤ Able to write in a variety of formats ➤ Read biographies and develop personality

19111AEC22	II	English-II	<ul style="list-style-type: none"> ➤ Appreciate different forms of literature ➤ Acquire language skills through literature ➤ Broadens the horizon of knowledge
19161SEC23	II	Business Accounting	<ul style="list-style-type: none"> ➤ Familiarize the concept of Branch account and its system ➤ Understand the Scope of departmental accounting ➤ Appreciate the need for negotiable instruments and procedure of accounting for bills honoured and dishonoured ➤ Differentiate Trade bills from Accommodation Bills ➤ Understand the concept of Consignment and learn the accounting treatment of the various aspects of consignment ➤ Distinguish Joint Venture and Partnership and to learn the methods of maintaining records under Joint Venture ➤ Understand the meaning and features of Non-Profit Organizations ➤ Learn to prepare Receipts & Payment Account, Income & Expenditure Account and Balance Sheet for Non-Profit Organizations

19161SEC24	II	Ethics in Business	<ul style="list-style-type: none"> ➤ Understand, and evaluate various organizational influences affecting ethical decisions ➤ Present and analyze ethical and moral issues ➤ Explore ethical theories ➤ Use contemporary and classical frameworks to analyze and suggest resolutions to ethical dilemmas. ➤ Identify and address common ethical issues that arise for individuals, managers, and organizations. ➤ Organize how individual differences and cognitive barriers can influence ethical judgment. ➤ Identify and prioritize personal values and apply those to making ethical decisions.
19161AEC25	II	Business Statistics	<ul style="list-style-type: none"> ➤ Critically evaluate the underlying assumptions of analysis tools ➤ Solve a range of problems using the techniques covered ➤ Conduct basic statistical analysis of data. ➤ Understand basic statistical concepts such as statistical collection, statistical series, tabular and graphical representation of data ➤ Calculate measures of central tendency, dispersion and asymmetry, correlation and regression analysis ➤ Choose a statistical method for solving practical problems

19161AEC26	II	Business Organization and Management	<ul style="list-style-type: none"> ➤ Understand the dynamics of marketing in business ➤ Ability and confidence to tackle common practical financial problems of business. ➤ Understand the scope of Business, and its importance. ➤ Identify different forms of business organizations viz; Sole Proprietorship, Partnership, Joint Hindu Family Business & Co-operative Organizations. ➤ Understand a Joint Stock Company and various formalities to promote a Company ➤ Learn various sources Industrial Financial resources and the means to raise them
19161RLS27	II	Research Led seminar	<ul style="list-style-type: none"> ➤ Know the emerging areas in research ➤ Learning experiences of students subject to research led teaching ➤ The institutional and organization issues surrounding such learning environments ➤ The development of such teaching on the disciplinary (subject-based) requirements of curricula design ➤ The opportunity to develop high level transferable skills

19120SEC02AL	II	Packages Lab-II	<ul style="list-style-type: none"> ➤ Identify the names and functions of the PowerPoint interface. ➤ Create, edit, save, and print presentations. ➤ Format presentations. ➤ Add a graphic to a presentation. ➤ Create and manipulate simple slide shows with outlines and notes. ➤ Create slide presentations that include text, graphics, animation, and transitions.
19111SEC02L	II	Communicative English Lab-II	<ul style="list-style-type: none"> ➤ Learn grammar. ➤ Use a variety of reading strategies ➤ Enhance the skill of making grammatically correct sentences.
19111OAEC31	III	Tamil III	<p>Achieve one's goal by following the ancestral path</p> <ul style="list-style-type: none"> ➤ Learn to lead life of perfection by realizing the uncertainty in the life ➤ Attain happiness through honesty
19111AEC31	III	Advanced English-III	<ul style="list-style-type: none"> ➤ Understand Phonetics. ➤ Develop writing skill ➤ Able to develop creative writing systems. ➤ Correct methodology when developing mathematical models. ➤ Skill in applications ➤ Designing and developing the solutions

19111AEC32	III	English-III	<ul style="list-style-type: none"> ➤ Enable to appreciate different types of prose ➤ Develop the conversational skills through one-act plays ➤ Enhance the skill of making grammatically correct sentences.
19161SEC33	III	Cost Accounting	<ul style="list-style-type: none"> ➤ Understand various costing systems and management systems ➤ Analyze and provide recommendations to improve the operations of organizations ➤ Imbibe conceptual knowledge of cost accounting. ➤ Understand the significance of cost accounting in the modern economic environment ➤ Select the costs according to their impact on business ➤ Apply cost accounting methods to evaluate and project business performance
19161SEC34	III	Banking Theory Law and Practice	<ul style="list-style-type: none"> ➤ Understanding of Banking Channels and Payments ➤ Practices on Banking Technology ➤ Understanding of Core Banking ➤ To gather knowledge on banking and financial system in India ➤ Understand better customer relationship ➤ To create awareness about modern banking services like e-banking, m-banking and internet banking

19161AEC35	III	Business Law for Managers	<ul style="list-style-type: none"> ➤ Explain the concepts in business laws with respect to foreign trade ➤ Apply the global business laws to current business environment ➤ Demonstrate an understanding of the Legal Environment of Business. ➤ Communicate effectively using standard business and legal terminology. ➤ Demonstrate recognition of the requirements of the contract agreement ➤ Identify contract remedies ➤ understand the various provisions of Company Law
19161AEC36	III	Essentials of Business Communication	<ul style="list-style-type: none"> ➤ Identify ethical, legal, cultural, and global issues affecting business communication. ➤ Utilize analytical and problem solving skills appropriate to business communication. ➤ Effective business writing ➤ Research approaches and information collection. ➤ Developing and delivering effective presentations ➤ Effective interpersonal communications ➤ Skills that maximize team effectiveness. ➤ Good time management.

19161RMC37	III	Research methodology	<ul style="list-style-type: none"> ➤ Able to carry out independent literature survey corresponding to the specific publication type and assess basic literary research tools. ➤ Familiarize participants with basic of research and the research process. ➤ Enable the participants in conducting research work and formulating research synopsis and report. ➤ Develop understanding on various kinds of research, objectives of doing research, research process, research designs and sampling. ➤ Have basic knowledge on qualitative research techniques ➤ Have adequate knowledge on measurement & scaling techniques as well as the quantitative data analysis ➤ Have basic awareness of data analysis-and hypothesis testing procedures
19120SEC03AL	III	Packages Lab-III	<ul style="list-style-type: none"> ➤ Indicate the names and functions of the Excel interface components. ➤ Enter and edit data. ➤ Format data and cells. ➤ Construct formulas, including the use of built-in functions, and relative and absolute references. ➤ Create and modify charts. ➤ Preview and print worksheets.

19111AEC03L	III	Communicative English Lab-III	<ul style="list-style-type: none"> ➤ Learn grammar. ➤ Develop speaking and writing skills ➤ Enhance their fluency in English ➤ Develop individual perspectives that demonstrate critical thinking skills
19110AEC41	IV	Tamil IV	<ul style="list-style-type: none"> ➤ Realize how the ancient people changed their life style according to the ages ➤ Learn how to change one's lifestyle according to the needs of the future ➤ Accept the modern trend and its uses
19111AEC41	IV	Advanced English-IV	<ul style="list-style-type: none"> ➤ Develop writing skill. ➤ Comprehend and describe poems ➤ Learn interviewing skills
19111AEC42	IV	English IV	<ul style="list-style-type: none"> ➤ Improve their ability to read and understand them ➤ Know the genius of Shakespeare ➤ Express in writing their views.
19161SEC43	IV	Partnership Accounting	<ul style="list-style-type: none"> ➤ Understand the concept of partnership ➤ Understand the journal entries for the formation of partnership ➤ Familiarize the concept of Branch account and its system ➤ Understand the Scope of departmental accounting ➤ Introduce the system of Hire Purchasing ➤ Understand partnership account from admission to dissolution

19161SEC44	IV	Advertising and sales promotion	<ul style="list-style-type: none"> ➤ Understand the key principles and tools of integrated marketing communication ➤ Explain the environmental factors which influence consumer and organizational decision ➤ Identify the elements of the communication process between buyers and sellers in business, making process ➤ Identify the marketing mix components in relation to market segmentation ➤ Outline a marketing plan ➤ Utilize marketing research techniques to resolve into competitive marketing decisions.
19161AEC45	IV	Company Law and Secretarial practice	<ul style="list-style-type: none"> ➤ Get a basic understanding of different type of meeting of board of directors. ➤ Use international trade terms and concepts when communicating. Demonstrate comprehensive knowledge and understanding of social and economic policy considerations arising in this area. ➤ Understanding of those areas of company law identified in the indicative syllabus above and form a critical judgement on areas of controversy within the topics studied; ➤ Read and study primary and secondary sources of company law, with minimal staff guidance; critically analyse, interpret, evaluate and synthesise information from a variety of sources ➤ Identify sources for research and further develop a strategy for research using standard and electronic research tools

19161AEC46	IV	Office management	<ul style="list-style-type: none"> ➤ To make them understand office management and duties of an office manager ➤ To give an idea about proper filing and indexing of office documents ➤ To understand the principles of record management and different types of records in business organization ➤ To enable them to aware about safety hazardous and steps to improve office safety ➤ To introduce different measures of office work ➤ The course helped the students to know the importance of Office Management in the present competitive world.
19120SEC04AL	IV	Packages Lab-IV	<ul style="list-style-type: none"> ➤ Examine database concepts and explore the Microsoft Office Access environment. ➤ Design a simple database. ➤ Build a new database with related tables. ➤ Manage the data in a table. ➤ Query a database using different methods. ➤ Design a form. ➤ Generate a report. ➤ Import and export data.
19111SEC04L	IV	Communicative English Lab-IV	<ul style="list-style-type: none"> ➤ Learn grammar. ➤ Enable to express their views in conversation ➤ Develop soft skills ➤ Enhance presentation skills

191ENVSTU	IV	Environmental Studies	<ul style="list-style-type: none"> ➤ Learn about environmental pollution. ➤ Familiarize with the social issues and the environment
19161SEC51	V	Corporate Accounting	<ul style="list-style-type: none"> ➤ Find out how a company can dissolve. ➤ Understand Mutual funds' investments. ➤ Learn about working format of companies. ➤ Enabling the students to understand the features of Shares and Debentures ➤ Develop an understanding about redemption of Shares and Debenture and its type ➤ Exposure to the company final accounts
19161SEC52	V	Financial Management	<ul style="list-style-type: none"> ➤ Use business finance terms and concepts when communicating. ➤ Demonstrate a basic understanding of financial management. ➤ Provide introduction to Financial Management ➤ Create an awareness about capital structure and theories of capital structure ➤ Make them understand the cost of capital in wide aspects ➤ Provide knowledge about dividend policies and various dividend models. ➤ Enable them to understand working capital management

19161SEC53	V	Financial Services	<ul style="list-style-type: none"> ➤ Forecast a firm's future financing requirements ➤ Design an optimal capital structure. ➤ Give an idea about fundamentals of financial services and players in financial sectors ➤ Create an awareness about merchant banking, issue management, capital markets and role of SEBI ➤ Provide knowledge about leasing and hire purchase concepts ➤ Make them understand about different types of insurance and IRDA Act.
19161SEC54	V	Computer Application in Business	<ul style="list-style-type: none"> ➤ Study the development of computers and their components in each stage. ➤ Develop an idea of software, programming language and operating system. ➤ Study the concept of developing database and its maintenance using computers in a business Concern ➤ Analyze the importance of management information system and networking in a business. ➤ Be aware and perform various activities using computers in day to day life.

19161DSC54A	V	Co-operative law and practices	<ul style="list-style-type: none"> ➤ Know about the company law in the India. ➤ Understand the use of the memorandum of association and article of association in a company, they also learn from this course ➤ Develop Professionals in the filed of Co-operation, Co-operative law and Management. ➤ Promote qualified, Skilled and professional manpower to manage the affairs of the Cooperative Institutions. ➤ Enhance the Knowledge base of the in-service Personnel on the subject Co-operation, Co-operative law and Co-operative Management. ➤ Enable the in-service personnel to develop skills on Co-operative Management Techniques
19161DSC55B	V	Stock Exchange Practice	<ul style="list-style-type: none"> ➤ Understand the vocabulary and grammar of a trading floor. ➤ Experience the interactions between traders, sales, clients, brokers ➤ Realize in a personal and lively way what it requires to be a trader, a sales, a structure ➤ Identify Risk Management issues related to market positions ➤ Become familiar with practical trading techniques ➤ Formal training to Bloomberg platform (Bloomberg Market Concepts)

19161BRC56	V	Participation in Bounded Research	<ul style="list-style-type: none"> ➤ Do the allotted work in research ➤ Learn to do review of literature ➤ Hands on exposure to problem solving tools in contemporary research ➤ Evolution of research intuitiveness and orientation ➤ Familiarity with cutting edge research trends
19120SEC05AL	V	Packages Lab-V	<ul style="list-style-type: none"> ➤ work with the Photoshop workspace ➤ navigate images ➤ resize and crop images ➤ make and work with selections ➤ create new layers and perform other basic layer functions ➤ transform images.
19111SEC05L	V	Communicative English Lab-V	<ul style="list-style-type: none"> ➤ Develop corporate skills. ➤ Handle their day to day affairs well with their knowledge of language skills. ➤ Get a job

19161SEC61	VI	Management Accounting	<ul style="list-style-type: none"> ➤ Prepare analysis of various special decisions, using relevant costing and benefits ➤ More effective planning and control systems <p>The students thought and knowledge on management Accounting</p> <p>Helps to give proper idea on financial statement analysis in practical point of view</p> <p>Introduce the concept of fund flow and cash flow statement</p> <p>Provide knowledge about budget control keeping in mind the scope of the concept</p> <ul style="list-style-type: none"> ➤ Develop the know-how and concept of marginal costing with practical problems
19161SEC62	VI	Entrepreneurship and Small Business Management	<ul style="list-style-type: none"> ➤ Understand the systematic process to select the business ideas. ➤ Write a business plan ➤ Develop students about Entrepreneurship development ➤ Create an awareness on various Entrepreneurship Development Programme ➤ Enable them to understand project formulation ➤ Familiarize the students with EDP scheme

19161SEC63	VI	Auditing	<ul style="list-style-type: none"> ➤ Articulate knowledge of fundamental audit concepts ➤ Apply critical thinking skills and solve auditing Problems. ➤ Apply and demonstrate the accounting knowledge and skills in Auditing. ➤ Explain how analytical procedures are used as an audit tool. ➤ Illustrate effective internal controls ➤ Apply ethical standards to issues in auditing
19161DSC64A	VI	Income Tax Law & Practices	<ul style="list-style-type: none"> ➤ File IT Return on individuals basis ➤ Compute the total Income and Define tax complicacies and structure. ➤ In order to familiarize the different know-how and heads of income with its components ➤ It helps to build an idea about income from house property as a concept ➤ It gives more idea about the income from business or profession ➤ Make the students familiarizes with the concept of depreciation and its provisions

19161DSC64B	VI	Cooperation Theory	<ul style="list-style-type: none"> ➤ Greater Social support ➤ More on-task behavior ➤ Develop Professionals in the filed of Co-operation, Co-operative law and Management. ➤ Promote qualified, Skilled and professional manpower to managethe affairs of the Cooperative Institutions. ➤ Enhance the Knowledge base of the in-service Personnel on the subject Co-operation, Co-operative law and Co-operative Management. ➤ Enable the in-service personnel to develop skills on Co-operative Management Techniques
19161PRW66	VI	Project Work	<ul style="list-style-type: none"> ➤ Develop plans with relevant people to achieve the project's goals ➤ Break work down into tasks and determine handover procedures ➤ Identify links and dependencies, and schedule to achieve deliverables ➤ Estimate and cost the human and physical resources required, and make plans to obtain the necessary resources ➤ Allocate roles with clear lines of responsibility and accountability. ➤ Have adequate knowledge on measurement & scaling techniques as well as the quantitative data analysis
19120SEC06AL	VI	Packages Lab-VI	<ul style="list-style-type: none"> ➤ Learn to create animated graphics and sound and interactivity. ➤ Can develop Website ➤ CD based presentations

1911SEC06L	VI	Communicative English Lab-VI	<ul style="list-style-type: none"> ➤ Get a job ➤ Apply study skills ➤ Widen creative thinking ➤ Be a good team worker ➤ Make them proficient in English
------------	----	------------------------------	--

B.Com CA

PROGRAMME OUTCOMES	
PO1	To train them to communicate commerce by improving their English vocabulary, Speak, read, write and listen clearly in person and through electronic media in English and in one Indian language, and make meaning of the world by connecting people, ideas, books, media and technology.
PO2	Graduates will be able to develop strong understanding of core Commerce and Computer Application courses.
PO3	Able to take up challenging career options in Commerce and IT sector.
PO4	Gain updated knowledge to take up employment
PO5	Become ethically and socially responsible commerce graduates with computer application knowledge
PO6	Apply the knowledge of mathematics, Social science, accounting fundamentals, and computer specialization to the solution of complex accounting & management problems
PROGRAM SPECIFIC OUTCOME	
PSO1	Graduates will gain a strong foundation of knowledge in different areas of Commerce and Computer Application courses
PSO2	Graduates will be able to do pursue higher education and take-up jobs in the field of Commerce and Computer Applications.
PSO3	To develop an attitude for working effectively and efficiently in a business environment.
PSO4	To integrate knowledge, skill and attitude that will sustain an environment of learning and creativity among the students.
PROGRAM EDUCATIONAL OBJECTIVES	
PEO1	To provide in depth knowledge in Commerce and Computer Application courses

PEO2	To provide a strong foundation for higher education.
PEO3	To train the students in the application of computers in various business operations
PEO4	To nurture the students with the intellectual, personal and societal skills for an holistic education.
PEO5	To inculcate initiative in students for better industry acceptance with necessary

Course outcomes (Cos)

B.Com CA

S.No	Semester	Course Code/Name	Course Outcome
191110AEC11	I	Tamil I	<ul style="list-style-type: none"> ➤ Learn the changes occurred in literature since classical period. ➤ Make use of vocabulary systematically. ➤ Understand how to lead one's life realizing the modernity and its environment/atmosphere.
19111AEC11	I	Advanced English-I	<ul style="list-style-type: none"> ➤ Develop vocabulary ➤ Read and comprehend literature ➤ Learn to edit and do proof reading
191AAAEC12	I	English-I	<ul style="list-style-type: none"> ➤ Read and comprehend literature ➤ Appreciate poetry and prose ➤ Familiarize students with fiction.

19198SEC13	I	Financial accounting	<ul style="list-style-type: none"> ➤ Understanding the fundamental of financial accounting ➤ Develop the modern market economy ➤ Prepare the different kinds of financial statement ➤ Acquire conceptual knowledge of basics of accounting ➤ Identify and analyze the reasons for the difference between cash book and pass book balances ➤ Develop the skill of recording financial transactions and preparation of reports in accordance with GAAP ➤ The course helped the students the principles and objectives of basic Financial
19198SEC14	I	Business Management	<ul style="list-style-type: none"> ➤ Apply conceptual learning skills in today's business environment. ➤ Analyze financial performance of an organization. ➤ Evaluate organizational decisions with consideration of the political, legal and ethical aspects of business. ➤ Understand relationship between environment and business; Applying the environmental analysis techniques in practice ➤ Assess strengths, weaknesses, opportunities and threats of the business environment. ➤ Know state policies Economic legislations and Economic reforms laid by the

19198AEC15	I	Information Technology	<ul style="list-style-type: none"> ➤ Perform end user support including identifying and implementing solutions to user requests. ➤ Analyze technical requirements to determine resource requirements and the impact the solution will have on an organization. ➤ Design, plan, budget and propose an IT project for an identified need within a specific scope. ➤ Install technical hardware and software including network, database and security components. ➤ Perform routine maintenance to maintain the currency of an operating system, network, database and security needs. ➤ Identify and resolve technical problems using trouble-shooting and research techniques. ➤ Analyze and select application and operating system settings to create an optimal user environment.
------------	---	------------------------	--

19198AEC16	I	Operating System	<ul style="list-style-type: none"> ➤ Describe and explain the fundamental components of a computer operating system. [ABET (a), ➤ (i), (j), (k)] Assessment: Students will take midterm exams, final exams, and homework ➤ Describe and explain the fundamental components of a computer operating system. [ABET (a), ➤ (i), (j), (k)] Assessment: Students will take midterm exams, final exams, and homework. ➤ Define, restate, discuss, and explain the policies for scheduling, deadlocks, memory management, synchronization, system calls, and file systems. [ABET (a), (i), (j), (k)] Assessment: ➤ Students will take midterm exams, final exams, and homework. ➤ Describe and extrapolate the interactions among the various components of computing systems. ➤ [ABET (a), (i), (j), (k)] Assessment: Students will take midterm exams, final exams, and homework ➤ Design and construct the following OS components: System calls, Schedulers, Memory management systems, Virtual Memory and Paging systems. [ABET (a), (c), (i), (j), (k)] Assessment: ➤ Students will design and implement the above OS components within NACHOS with C++.
------------	---	------------------	---

19120SEC01AL	I	Package Lab-I	<ul style="list-style-type: none"> ➤ Recognize when to use each of the Microsoft Office programs to create professional and academic documents. ➤ Use Microsoft Office programs to create personal, academic and business documents following current professional and/or industry standards. ➤ Apply skills and concepts for basic use of computer hardware, software, networks, and the Internet in the workplace and in future coursework as identified by the internationally accepted Internet and Computing Core (IC3) standards.
19111AEC01L	I	Communicative English Lab-I	<ul style="list-style-type: none"> ➤ Learn grammar.. ➤ Develop listening skill ➤ Enrich vocabulary ➤ Understand the process of communication ➤ Develop listening skill
191INDCONS	I	Indian Constitution	<ul style="list-style-type: none"> ➤ Democratic values and citizenship Training are gained. ➤ Awareness on Fundamental Rights are established. . ➤ Learn the functions of union and State Governments ➤ Learn the power and functions of the Judiciary ➤ Appreciate of Democratic Parliamentary Rule
191110AEC21	II	Tamil II	<ul style="list-style-type: none"> ➤ Know what devotion really is. ➤ Know the fruitfulness obtained through devotion. ➤ Perceive the progress achieved in the society through devotion.

19111AEC21	II	Advanced English-II	<ul style="list-style-type: none"> ➤ Develop technological skill. ➤ Able to write in a variety of formats ➤ Read biographies and develop personality
19111AEC22	II	English-II	<ul style="list-style-type: none"> ➤ Appreciate different forms of literature ➤ Acquire language skills through literature ➤ Broadens the horizon of knowledge
19198SEC23	II	Business Accounting	<ul style="list-style-type: none"> ➤ Familiarize the concept of Branch account and its system Understand the Scope of departmental accounting <ul style="list-style-type: none"> ➤ Appreciate the need for negotiable instruments and procedure of accounting for bills honoured and dishonoured Differentiate Trade bills from Accommodation Bills <ul style="list-style-type: none"> ➤ Understand the concept of Consignment and learn the accounting treatment of various aspects of consignment Distinguish Joint Venture and Partnership and to learn the methods of maintaining records under Joint Venture <ul style="list-style-type: none"> ➤ Understand the meaning and features of Non-Profit Organizations ➤ Learn to prepare Receipts & Payment Account, Income & Expenditure Account and Balance Sheet for Non-Profit Organizations

19198SEC24	II	Business Law	<ul style="list-style-type: none"> ➤ Explain the concepts in business laws with respect to foreign trade ➤ Apply the global business laws to current business environment ➤ Demonstrate an understanding of the Legal Environment of Business. ➤ Communicate effectively using standard business and legal terminology. ➤ Demonstrate recognition of the requirements of the contract agreement ➤ Identify contract remedies ➤ understand the various provisions of Company Law
19198AEC25	II	Business Statistics	<ul style="list-style-type: none"> ➤ Critically evaluate the underlying assumptions of analysis tools ➤ Solve a range of problems using the techniques covered ➤ Conduct basic statistical analysis of data. ➤ Understand basic statistical concepts such as statistical collection, statistical series, tabular and graphical representation of data ➤ Calculate measures of central tendency, dispersion and asymmetry, correlation and regression analysis ➤ Choose a statistical method for solving practical problems

19198AEC26	II	Programming in C	<ul style="list-style-type: none"> ➤ Understanding a functional hierarchical code organization. ➤ Ability to define and manage data structures based on problem subject domain. ➤ Understanding a concept of object thinking within the framework of functional model. ➤ Understanding a concept of functional hierarchical code organization. ➤ Understand operators, expressions and preprocessors. ➤ Understand arrays, its declaration and uses.
19198AEC26L	II	Programming in C lab	<ul style="list-style-type: none"> ➤ Develop their programming skills. ➤ Declaration of variables and constants ➤ Be familiar with programming environment with C Program structure. ➤ Ability to work with textual information, characters and strings. ➤ Understanding a defensive programming concept. Ability to handle possible errors during program execution ➤ Understanding a functional hierarchical code organization. Ability to define and manage data structures based on problem subject domain.

19198RLS27	II	Research Led seminar	<ul style="list-style-type: none"> ➤ Know the emerging areas in research ➤ Learning experiences of students subject to research led teaching ➤ The institutional and organization issues surrounding such learning environments ➤ The development of such teaching on the disciplinary (subject-based) requirements of curricula design ➤ The opportunity to develop high level transferable skills <p>Students will be able to new technologies and research skill developme</p>
19120SEC02AL	II	Packages Lab-II	<ul style="list-style-type: none"> ➤ Identify the names and functions of the PowerPoint interface. ➤ Create, edit, save, and print presentations. ➤ Format presentations. ➤ Add a graphic to a presentation. ➤ Create and manipulate simple slide shows with outlines and notes. ➤ Create slide presentations that include text, graphics, animation, and transitions.
19111AEC02L	II	Communicative English Lab-II	<ul style="list-style-type: none"> ➤ Learn grammar. ➤ Use a variety of reading strategies ➤ Enhance the skill of making grammatically correct sentences.

19110AEC31	III	Tamil III	<ul style="list-style-type: none"> ➤ Achieve one's goal by following the ancestral path ➤ Learn to lead life of perfection by realizing the uncertainty in the life ➤ Attain happiness through honesty
19111AEC31	III	Advanced English-III	<ul style="list-style-type: none"> ➤ Understand Phonetics. ➤ Develop writing skill ➤ Able to develop creative writing systems. ➤ Correct methodology when developing mathematical models. ➤ Skill in applications ➤ Designing and developing the solutions
19111AEC32	III	English-III	<ul style="list-style-type: none"> ➤ Enable to appreciate different types of prose ➤ Develop the conversational skills through one-act plays ➤ Enhance the skill of making grammatically correct sentences.
19198SEC33	III	Cost Accounting	<ul style="list-style-type: none"> ➤ Understand various costing systems and management systems ➤ Analyze and provide recommendations to improve the operations of organizations ➤ Imbibe conceptual knowledge of cost accounting. ➤ Understand the significance of cost accounting in the modern economic environment ➤ Select the costs according to their impact on business ➤ Apply cost accounting methods to evaluate and project business performance

19198SEC34	III	Banking Theory Law and Practice	<ul style="list-style-type: none"> ➤ Understanding of Banking Channels and Payments ➤ Practices on Banking Technology ➤ Understanding of Core Banking ➤ To gather knowledge on banking and financial system in India ➤ Understand better customer relationship ➤ To create awareness about modern banking services like e-banking, m-banking and internet banking
19198AEC35	III	Programming in C++	<ul style="list-style-type: none"> ➤ To know the proper lines of C++, Encapsulation, Inheritance and Polymorphism. ➤ To explain the various data types, operations and functions of C++. ➤ To know the concept of constructors and destructors. ➤ To explain the concept of inheritances, types of inheritance and polymorphism, virtual ➤ Functions. ➤ To explain the types of streams, format and format of input and output operations. ➤ To Know the procedural and object oriented paradigm with concepts of streams, classes, functions, data and objects.

19198AEC36L	III	Programming in C++ Lab	<ul style="list-style-type: none"> ➤ To know the proper lines of C++, Encapsulation, Inheritance and Polymorphism. ➤ To explain the various data types, operations and functions of C++. ➤ To know the concept of constructors and destructors. ➤ To explain the concept of inheritances, types of inheritance and polymorphism, virtual Functions. ➤ To explain the types of streams, format and format of input and output operations. ➤ To Know the procedural and object oriented paradigm with concepts of streams, classes, functions, data and objects.
-------------	-----	---------------------------	--

19198RMC37	III	Research methodology	<ul style="list-style-type: none"> ➤ Able to carry out independent literature survey corresponding to the specific publication type and assess basic literary research tools. ➤ Familiarize participants with basic of research and the research process. ➤ Enable the participants in conducting research work and formulating research synopsis and report. ➤ Develop understanding on various kinds of research, objectives of doing research, research process, research designs and sampling. ➤ Have basic knowledge on qualitative research techniques ➤ Have adequate knowledge on measurement & scaling techniques as well as the quantitative data analysis ➤ Have basic awareness of data analysis-and hypothesis testing procedures
19120SEC03AL	III	Packages Lab-III	<ul style="list-style-type: none"> ➤ Indicate the names and functions of the Excel interface components. ➤ Enter and edit data. ➤ Format data and cells. ➤ Construct formulas, including the use of built-in functions, and relative and absolute references. ➤ Create and modify charts. ➤ Preview and print worksheets.

19111AEC03L	III	Communicative English Lab-III	<ul style="list-style-type: none"> ➤ Learn grammar. ➤ Develop speaking and writing skills ➤ Enhance their fluency in English ➤ Develop individual perspectives that demonstrate critical thinking skills
19110AEC41	IV	Tamil IV	<ul style="list-style-type: none"> ➤ Realize how the ancient people changed their life style according to the ages ➤ Learn how to change one's lifestyle according to the needs of the future ➤ Accept the modern trend and its uses
19111AEC41	IV	Advanced English-IV	<ul style="list-style-type: none"> ➤ Develop writing skill. ➤ Comprehend and describe poems ➤ Learn interviewing skills
19111AEC42	IV	English IV	<ul style="list-style-type: none"> ➤ Improve their ability to read and understand them ➤ Know the genius of Shakespeare ➤ Express in writing their views.
19198SEC43	IV	Auditing	<ul style="list-style-type: none"> ➤ Articulate knowledge of fundamental audit concepts ➤ Apply critical thinking skills and solve auditing Problems. ➤ Apply and demonstrate the accounting knowledge and skills in Auditing. ➤ Explain how analytical procedures are used as an audit tool. ➤ Illustrate effective internal controls ➤ Apply ethical standards to issues in auditing

19198SEC44	IV	Business Statistics	<ul style="list-style-type: none"> ➤ Critically evaluate the underlying assumptions of analysis tools ➤ Solve a range of problems using the techniques covered ➤ Conduct basic statistical analysis of data. ➤ Understand basic statistical concepts such as statistical collection, statistical series, tabular and graphical representation of data ➤ Calculate measures of central tendency, dispersion and asymmetry, correlation and regression analysis ➤ Choose a statistical method for solving practical problems
19198AEC45	IV	Visual Basic Programming	<ul style="list-style-type: none"> ➤ Students code visual programs by using Visual Basic work environment. ➤ Distinguish and compose events and methods. ➤ Distinguish and compose events and methods. ➤ Recognize and arrange control structures. ➤ Understand development of applications. ➤ Identify sources for research and further develop a strategy for research using standard and electronic research tools C ➤ This course will be helped the students understanding on database operations

19198AEC46L	IV	Visual Basic Programming in Lab	<ul style="list-style-type: none"> ➤ Understand an overview of computers and computer programming. ➤ Understand Visual Basic applications. ➤ Understand how to perform operations and store results. ➤ Understand the concept of data-driven program execution flow control in Visual Basic programming ➤ Understand additional Visual Basic controls. ➤ Understand loops to do repetition.
19120SEC04AL	IV	Packages Lab-IV	<ul style="list-style-type: none"> ➤ Examine database concepts and explore the Microsoft Office Access environment. ➤ Design a simple database. ➤ Build a new database with related tables. ➤ Manage the data in a table. ➤ Query a database using different methods. ➤ Design a form. ➤ Generate a report. ➤ Import and export data.

19111AEC04L	IV	Communicative English Lab-IV	<ul style="list-style-type: none"> ➤ Learn grammar. ➤ Enable to express their views in conversation ➤ Develop soft skills ➤ Enhance presentation skills
191ENVTSTU	IV	Environmental Studies	<ul style="list-style-type: none"> ➤ Learn about environmental pollution. ➤ Familiarize with the social issues and the environment ➤ Will be able to do independent research on human interactions with the environment. ➤ To recognize the physical, chemical, and biological components of the earth's systems and show how they function ➤ Analyze and evaluate ideological and philosophical approaches used to understand environmental relationships. ➤ Carry out an applied research project in the natural sciences.
19198SEC51	V	Corporate Accounting	<ul style="list-style-type: none"> ➤ Find out how a company can dissolve. ➤ Understand Mutual funds' investments. ➤ Learn about working format of companies. ➤ Enabling the students to understand the features of Shares and Debentures ➤ Develop an understanding about redemption of Shares and Debenture and its type ➤ Exposure to the company final accounts

19198SEC52	V	Business Economics	<ul style="list-style-type: none"> ➤ Apply the concept of opportunity cost. ➤ Understand the concepts of cost, nature of production and its relationship to Business operations. ➤ Apply Economic theories to business decision ➤ Use the theoretical concept of demand and supply analysis in practice ➤ Understand the cost concepts, theories of profit and business cycles ➤ Use different demand forecasting techniques and apply different pricing techniques in business ➤ Understand the importance of Fiscal policy
19198SEC53	V	Financial Management	<ul style="list-style-type: none"> ➤ Use business finance terms and concepts when communicating. ➤ Demonstrate a basic understanding of financial management. ➤ Provide introduction to Financial Management ➤ Create an awareness about capital structure and theories of capital structure ➤ Make them understand the cost of capital in wide aspects ➤ Provide knowledge about dividend policies and various dividend models. ➤ Enable them to understand working capital management

19198SEC54	V	Software Engineering	<ul style="list-style-type: none"> ➤ To identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics ➤ To apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors ➤ An ability to communicate effectively with a range of audiences ➤ Analyze the importance of management information system and networking in a business. ➤ Be aware and perform various activities using computers in day to day life.
19198DSC55A	V	Investment Management	<ul style="list-style-type: none"> ➤ The knowledge and skills to select and employ base ➤ Level tools for financial analysis. ➤ The knowledge and skills to analyze companies for ➤ Investment purposes. ➤ The knowledge and skills to develop portfolio strategies for individual and institutional investors. ➤ The knowledge and to operate ethically as ➤ Investment management professionals. ➤ Understand the various alternatives available for investment. ➤ Gain knowledge of the various strategies followed by investment practitioners

19198DSC55B	V	Stock Practice Market	<ul style="list-style-type: none"> ➤) Understand the vocabulary and grammar of a trading floor Experience the interactions between traders, sales, clients, brokers ➤ Realize in a personal and lively way what it requires to be a trader, a sales, a structure ➤ Identify Risk Management issues related to market positions ➤ Become familiar with practical trading techniques ➤ Formal training to Bloomberg platform (Bloomberg Market Concepts)
19198BRC56	V	Participation in Bounded Research	<ul style="list-style-type: none"> ➤ Do the allotted work in research ➤ Learn to do review of literature ➤ Hands on exposure to problem solving tools in contemporary research ➤ Evolution of research intuitiveness and orientation ➤ Familiarity with cutting edge research trends
19120SEC05AL	V	Packages Lab-V	<ul style="list-style-type: none"> ➤ work with the Photoshop workspace ➤ navigate images ➤ resize and crop images ➤ make and work with selections ➤ create new layers and perform other basic layer functions ➤ transform images.

19111AEC05L	V	Communicative English Lab-V	<ul style="list-style-type: none"> ➤ Develop corporate skills. ➤ Handle their day to day affairs well with their knowledge of language skills. ➤ Get a job
19198SEC61	VI	Management Accounting	<ul style="list-style-type: none"> ➤ with practical problems to give proper idea on ➤ financial statement Prepare analysis of various special decisions, using relevant costing and benefits ➤ More effective planning and control systems ➤ The students thought and knowledge on management Accounting Helps analysis in practical point of view ➤ Introduce the concept of fund flow and cash flow statement ➤ Provide knowledge about budget control keeping in mind the scope of the concept ➤ Develop the know-how and concept of marginal costing
19198SEC62	VI	Income Tax Law & Practices	<ul style="list-style-type: none"> ➤ File IT Return on individuals basis Compute the total Income and Define tax complications and structure. In order to familiarize the different know-how and heads of income with its components It helps to build an idea about income from house property as a concept ➤ It gives more idea about the income from business or profession ➤ Make the students familiarizes with the concept of depreciation and its provisions

19198SEC63	VI	Database Management System	<ul style="list-style-type: none"> ➤ Understand database concepts and structures and query language ➤ Understand the E R model and relational model ➤ Understand Functional Dependency and Functional Decomposition. ➤ Apply various Normalization techniques ➤ Understand query processing and techniques involved in query optimization. ➤ Understand the principles of storage structure and recovery management. ➤ Understand database concept and structures and query language.
19198DSC64A	VI	E- Commerce	<ul style="list-style-type: none"> ➤ Demonstrate an understanding of the foundations and importance of E-commerce ➤ Analyze the impact of E-commerce on business models and strategy ➤ Describe the infrastructure for E-commerce ➤ Discuss legal issues and privacy in E-Commerce ➤ Assess electronic payment systems ➤ Recognize and discuss global E-commerce issues

19198DSC64B	VI	Web Designing	<ol style="list-style-type: none"> 1. Develop a fully functioning website and deploy on a web server. 2. Find and use code packages based on their documentation to produce working results in a project. 3. Create webpages that function using external data. 4. Architect solutions to programming problems by combining visual components and classes. 5. Develop JavaScript applications that transition between states. 6. Identify mobile strategies and design for multiple operating systems. 7. Distinguishing trends in multi-device implementation.
19198PRW66	VI	Project Work	<ul style="list-style-type: none"> ➤ Develop plans with relevant people to achieve the project's goals ➤ Break work down into tasks and determine handover procedures ➤ Identify links and dependencies, and schedule to achieve deliverables ➤ Estimate and cost the human and physical resources required, and make plans to obtain the necessary resources ➤ Allocate roles with clear lines of responsibility and accountability. ➤ Have adequate knowledge on measurement & scaling techniques as well as the quantitative data analysis

19120SEC06AL	VI	Packages Lab-VI	<ul style="list-style-type: none"> ➤ Learn to create animated graphics add sound and interactivity. ➤ Can develop Website ➤ CD based presentations
19111AEC06L	VI	Communicative English Lab-VI	<ul style="list-style-type: none"> ➤ Get a job ➤ Apply study skills ➤ Widen creative thinking ➤ Be a good team worker ➤ Make them proficient in English

M.Com

PROGRAMME OUTCOMES	
PO1	To acquaint a student with conventional as well as contemporary areas in the discipline of Commerce.
PO2	To enable a student well versed in national as well as international trends.
PO3	To enable the students for conducting business, accounting and auditing practices, role of regulatory bodies in corporate and financial sectors nature of various financial instruments
PO4	To provide in-depth understanding of all core areas specifically Advanced Accounting, International Accounting, Management, Security Market Operations and Business Environment, Research Methodology and Tax planning.
PO5	Serve as a human resource needed for industry, consultancy, education, service, research, public administration, insurance and management
PO6	Understand financial and marketing both local and international issues and responsibilities of a business organization.
PROGRAM SPECIFIC OUTCOME	
PSO1	To inculcate the knowledge of business and the techniques of managing the business with special focus on marketing, Insurance and banking theory law and practices.
PSO2	To impart the knowledge basic accounting principles and the latest- application oriented corporate accounting methods.
PSO3	To develop the decision making skill through costing methods and practical- application of management accounting principles.

PSO4	To enhance the horizon of knowledge in various field of commerce through- advertising and sales promotion, auditing and entrepreneurial development.
PROGRAM EDUCATIONAL OBJECTIVES	
PEO1	To Make plan for the promotion and development of Industry
PEO2	To produce professional Mangers, Accountants and innovative Businessman
PEO3	To act as good manager and have a creative and helpful in problem solving.
PEO4	To develop new ideas and applications to latest information technology and in the business and are able to implement these ideas in practice.

Course outcomes (Cos)

M.Com

S.No	Semester	Course Code/Name	Course Outcome
19261SEC11	I	Marketing Research and Consumer Behaviour	<ul style="list-style-type: none"> ➤ This specialization lays the necessary groundwork for an overall successful marketing strategy ➤ Knowledge required to understand the state of your product before approaching the market strategy ➤ Interpret development of marketing research ➤ Identify the major influences in Consumer Behaviour ➤ Theory of Consumer behaviour and relates it to the practice of marketing. ➤ Demonstrate how knowledge of consumer behaviour can be applied to marketing.

19261SEC12	I	Human Resource Management	<ul style="list-style-type: none"> ➤ Contribute to the development, implementation, and evaluation of employee recruitment, selection, and retention plans and processes ➤ Develop, implement, and evaluate employee orientation, training, and development programs. ➤ Understanding of the basic concepts, functions and processes of HRM ➤ Develop a selection and interviewing program ➤ Know formalize, Design and evaluate various Recruitment and Placement policies. ➤ Use methods of collecting job analysis information.
19261SEC13	I	Services Marketing	<ul style="list-style-type: none"> ➤ Focuses on services, service design, and service innovation, with the aim of developing empathy for customers and understanding the customer experience ➤ Strategies that support broader marketing decisions. ➤ Develop an understanding of the role of relationship marketing and customer service ➤ Demonstrate knowledge of the extended marketing mix for services. ➤ Exhibit the capability to work effectively within a team environment. ➤ Develop and justify marketing planning and Control Systems.

19261SEC14	I	Advanced Cost Management	<ul style="list-style-type: none"> ➤ Study of decision making and performance evaluation techniques in management accounting ➤ Understand decision making and performance evaluation techniques in management accounting. ➤ In modern competitive business environment, suitable business decision making is very crucial ➤ Identify relevant information for decision making purposes in order to produce financial analyses for a range of decisions such as product-mix, pricing, outsourcing and special orders. ➤ Use standard costs to prepare budgets for planning and control purposes. ➤ Understand the principles of standard costing.
19261DSC15 A	I	Strategic Management	<ul style="list-style-type: none"> ➤ Understand the basic concepts and principles of strategic management analyse the internal and external environment of business. ➤ Develop and prepare organizational strategies that will be effective for the current business environment ➤ Devise strategic approaches to managing a business successfully in a global context
19261DSC15 B	I	Organizational Behaviour	<ul style="list-style-type: none"> ➤ Examine the differences and similarities between leadership, power, and management ➤ Impact that a company's structure and design can have on its organizational behavior ➤ Impact of culture on organizational behavior ➤ Analyze management issues as related to organizational behavior ➤ Examine challenges of effective organizational communication ➤ Evaluate ethical issues as related to organizational behavior

19261RLC16	I	Research Led Seminar	<ul style="list-style-type: none"> ➤ Develop skills in data collection and complex analysis ➤ Clarify terminology and approaches to different facets of research-based teaching ➤ Explore good practices in institution-driven, strategic approaches on how to integrate research and education missions ➤ Generate ideas on how to build the capacity of faculty members to implement research based teaching ➤ Create a research-based learning environment ➤ Analyze national frameworks, policies and funding
19261SEC21	II	Quantitative techniques for Business Decision Making	<ul style="list-style-type: none"> ➤ Employ basic statistical methods to decision making ➤ Understand how to apply basic models and theories in business ➤ Solve management problems effectively ➤ Use software tools to model decision problems. ➤ Clearly identify an otherwise unstructured business problem and its components ➤ Employ effective techniques for addressing the major challenges presented ➤ Provide a solution to the decision process

19261SEC 22	II	Total Quality Management	<ul style="list-style-type: none"> ➤ Given a product or a service type, the student manager will be able to enumerate and justify the dimensions of product quality or service quality for the same ➤ Given the quality gurus (Deming/ Juran/ Taguchi/ Crosby), the student manager will be able to justify their philosophies/ contributions in Quality Management. ➤ Given a quality problem/ failure mode, the student manager will be able to identify causes and sub causes of the effect/ problem draw and justify Ishikawa Diagram. ➤ For a given type of organization, the student manager will be able to enlist and justify the four levels of benchmarking and/ or enlist and brief seven step benchmarking model ➤ The student manager will be able to differentiate between common and special cause of variation and/ or differentiate between attributes and variables and/ or construct and write formulae for control charts for variables and attributes. ➤ Critically appraise the organisational, communication and teamwork requirements for effective quality management
-------------	----	--------------------------	--

19261SEC23	II	Advanced Management Accounting	<ul style="list-style-type: none"> ➤ Activity based approaches to management and cost analysis ➤ Analysis of common costs in manufacturing and service industry ➤ Techniques for profit improvement, cost reduction, and value analysis ➤ Throughput accounting ➤ Target costing; cost ascertainment and pricing of products and services ➤ Pricing Decisions ➤ Budgets and Budgetary Control ➤ Evolution of standards, continuous - improvement; keeping standards meaningful and relevant; variance analysis
19261DSC25 A	II	Retail Management	<ul style="list-style-type: none"> ➤ The role that retailing plays in the distribution component of the marketing mix ➤ Understanding of the concept of social responsibility and the role it plays in retailing ➤ Aware of the moral and ethical dilemmas that face the retailing industry in today's business environment ➤ Development and understanding of implementing a retail strategy. ➤ Understanding of the increased use of technology in the field of retailing ➤ Identify key roles within retail businesses
19261DSC25 B	II	Corporate Legal Frame Work	<ul style="list-style-type: none"> ➤ able to appreciate the importance of law and legal institutions in business ➤ able to have a basic understanding of the laws relating to contract, consumer protection, competition, companies and dispute resolution

19261RMC2 6	II	Research Methodology	<ul style="list-style-type: none"> ➤ Assess critically the following methods: literature study, case study, structured surveys, interviews, focus groups, participatory approaches, narrative analysis, cost- ➤ Critically assess research methods pertinent to technology innovation research. ➤ Understanding research questions and tools ➤ Experience in scientific writings ➤ Practice in various aspects of scientific publications ➤ Inculcation of research ethics
19261BRC27	II	Participation in bounded research	<ul style="list-style-type: none"> ➤ Develop understanding on various kinds of research, objectives of doing research, research process, research designs and sampling. ➤ Have basic knowledge on qualitative research techniques ➤ Have adequate knowledge on measurement & scaling techniques as well as the quantitative data analysis ➤ Have basic awareness of data analysis-and hypothesis testing procedures ➤ knowledge for enabling students to develop data analytics skills and meaningful interpretation to the data sets so as to solve the business/Research problem. ➤ Describe sampling methods, measurement scales and instruments, and appropriate uses of each
19261SEC31	III	Project Planning and Control	<ul style="list-style-type: none"> ➤ Understand the How Subcontract Administration and Control is practiced in the Industry. ➤ Understand the contract management, Project Procurement, Service level Agreements and productivity ➤ Apply the risk management plan and analyse the role of stakeholders. ➤ Analyse the learning and understand techniques for Project planning, scheduling and Execution Control. ➤ Understand the conceptual clarity about project organization ➤ Understand project characteristics and various stages of a project

19261SEC32	III	Advanced Corporate Accounting	<ul style="list-style-type: none"> ➤ Critically analyse both older and newer MA methods and their effects in organisations ➤ Knowledge and understanding about MA issues, including its problems and difficulties ➤ Part in the design and use of the management accounting system in organisations ➤ Updated concerning the more recent development in MA and the emergence of new methods ➤ More advanced level compared to the basic knowledge acquired on the Bachelor level ➤ Exposure to the company final accounts
19261DSC34 A	III	International Marketing	<ul style="list-style-type: none"> ➤ Upon successful completion, students will have the knowledge and skills to: ➤ Classify strategies for entering export markets from extant knowledge and research. ➤ Apply core theoretical concepts in international marketing to find practical solutions to constraints of small businesses.

19261DSC34 B	III	Indian Financial System	<ul style="list-style-type: none"> ➤ Knowledge, understanding and skills in the area of international financial relations and tolls for its implementation ➤ Knowledge and understanding of characteristics, activities, principles and specifics of international financial relations ➤ Ability to summarize and critically evaluate results obtained by researchers in the field of international financial relations ➤ Ability to analyze and use various sources of information and data in the field and make assessment ➤ Use methods in the field of international finance in practice ➤ Economic essence and currency classifications: the concept of currency and its basic classification; characteristics of currencies
19261SRC35	III	Scaffold Research (Societal Project)	<ul style="list-style-type: none"> ➤ To help students manage individual or team projects. ➤ Begin project-planning with a specific audience with a specific and pressing concern ➤ Let students design their own projects. Or require that projects iterate or counter existing cultural trends and patterns or that address compelling social concerns (e.g. Technology addiction). ➤ Use concept-mapping before, during, and after the project is completed. ➤ Give students the opportunities to use their specific gifts, skills, and backgrounds in completing the project. ➤ Help students brainstorm the opportunities for creative risk-taking at the beginning of a project.

19261SEC41	IV	Income Tax Law and Tax Planning	<ul style="list-style-type: none"> ➤ File IT Return on individuals basis ➤ Compute the total Income and Define tax complicacies and structure. ➤ In order to familiarize the different know-how and heads of income with its components ➤ It helps to build an idea about income from house property as a concept ➤ Make the students familiarizes with the concept of depreciation and its provisions ➤ It give more idea about the income from business or profession
19261SEC42	IV	International Business	<ul style="list-style-type: none"> ➤ Have developed an understanding of major issues related to international Business ➤ Have developed skills in researching and analyzing trends in global markets and in modern marketing practice ➤ An organization's ability to enter and compete in international markets. ➤ Develop skills in researching and analyzing international Business opportunities ➤ Develop a high level of analytical skills and critical thinking in an international Business context ➤ Explain the main institutions that shape the global marketplace;

19261SEC43	IV	Cooperation in India and Abroad	<ul style="list-style-type: none"> ➤ Know about the company law in the Abroad. ➤ Understand the use of the memorandum of association and article of association in a company, they also learn from this course ➤ Develop Professionals in the filed of Co-operation, Co-operative law and Management. ➤ Promote qualified, Skilled and professional manpower to manage the affairs of the Cooperative Institutions. ➤ Enhance the Knowledge base of the in-service Personnel on the subject Co-operation, Co-operative law and Co-operative Management. ➤ Enable the in-service personnel to develop skills on Co-operative Management Techniques
19261DSC44 A	IV	International Financial Management	<ul style="list-style-type: none"> ➤ Understand international capital and foreign exchange market. ➤ Identify and appraise investment opportunities in the international environment. ➤ Identify risk relating to exchange rate fluctuations and develop strategies to deal with them ➤ Identify and evaluate foreign direct investment and international acquisition opportunities ➤ Develop strategies to deal with other types of country risks associated with foreign operations ➤ Express well considered opinion on issues relating to international financial management.

19261PRW4 5	IV	Project Work	<ul style="list-style-type: none"> ➤ Develop plans with relevant people to achieve the project's goals ➤ Break work down into tasks and determine handover procedures ➤ Identify links and dependencies, and schedule to achieve deliverables ➤ Estimate and cost the human and physical resources required, and make plans to obtain the necessary resources ➤ Allocate roles with clear lines of responsibility and accountability. ➤ Have adequate knowledge on measurement & scaling techniques as well as the q ➤ Quantitative data analysis
----------------	----	--------------	--

M.Phil.,

PROGRAMME OUTCOMES	
PO1	➤ Infusing research flair among scholars by developing their research aptitude
PO2	➤ Provide an extensive and in-depth knowledge on subject of specialization
PO3	➤ To inculcate problem solving and decision making skills necessary to execute their day to day professional & social responsibilities
PO4	➤ Prepare scholars for undertaking higher responsibilities in such areas as Financial Management, Human Resource Management, Marketing Management
PO5	➤ To sensitize about the emerging challenges and issues across the Globe in Trade and Commerce
PO6	➤ To make the students to develop a comprehensive idea of commerce and trade
PO7	➤ Provide training required for undertaking research in commerce
PROGRAM SPECIFIC OUTCOME	

PSO1	➤ Capable to carry out Quality Research independently
PSO2	➤ Able to understand subjects clearly and communicate effectively making them ideal choice for occupying academic positions
PSO3	➤ Pursue Ph.D programme with norms of scholarly research that chip into the augmentation of students personal and professional development
PSO4	➤ Acquire in-depth knowledge of the process of developing new materials as well as gain expertise of well-defined area of research in Commerce.
PROGRAM EDUCATIONAL OBJECTIVES	
PEO1	➤ Research Scholars will be capable of making a positive contribution to commerce, trade and industry in the national and global context
PEO2	➤ They will be able to apply frameworks and tools to arrive at informed decisions in profession and practice, striking a balance between business and social dimensions.
PEO3	➤ They are capable to recognize the need for adapting to change and have the aptitude and ability to engage in independent and life – long learning in the broadest context of socio-economic, technological and global change.
PEO4	➤ They gain expertise Skill to Act as administrators in public, private and government organizations or business establishments or entrepreneurs with further training and education
PEO5	➤ They will identify and Pursue further researches for doctoral Programme.
PEO6	➤ They are capable to work as a lecturer in where is colleges and universities

Course outcomes (Cos)

M.Phil.,

S.No	Semester	Course Code/Name	Course Outcome
-------------	-----------------	-------------------------	-----------------------

193COC11	I	Research Methodology	<ul style="list-style-type: none"> ➤ Understanding the nature of problem to be studied and identifying the related area of knowledge. ➤ Reviewing literature to understand how others have approached or dealt with the problem. ➤ Collecting data in an organized and controlled manner so as to arrive at valid decisions. ➤ Analyzing data appropriate to the problem. ➤ Define and develop a possible HIEDresearch interest area using specific research designs;
193COC12	I	Advanced Functional Management	<ul style="list-style-type: none"> ➤ To help the students gain understanding of the functions and responsibilities of managers. ➤ To know various tools from accounting and cost accounting this would facilitate the decision making ➤ To explore the economics of information and network industries and to equipstudents with an understanding of howeconomics affect the business strategy ofcompanies in these industries. ➤ To provide the students with an understanding of fundamental legal issues pertaining to the business world toenhance their ability to manage businesses effectively. ➤ To use statistical techniques for analysis of research data ➤ To gain a solid understanding of human behavior in the workplace from an individual, group, and organizational perspective. ➤ To learn to study and design HRM system ➤ To understand the relationship between Operations & SCM and other business functions, such as Marketing, Finance, Accounting, and Human Resources

193COC13 A		Marketing Management	<ul style="list-style-type: none"> ➤ To introduce the concept of Marketing Mix as a framework for Marketing Decision making. ➤ To emphasize the need, importance and process of Marketing Planning and Control. ➤ To sensitize the students to the dynamic nature of Marketing Function. <ul style="list-style-type: none"> ➤ Understand fundamental marketing concepts, theories and principles in areas of marketing policy ➤ Apply the knowledge, concepts, tools necessary to understand challenges ➤ Understand the marketing concepts and its evolution ➤ The course helped the students to know the principles and Practices of Marketing Mix and Marketing Research.
193COC13 B	I	Human Resource Management	<ul style="list-style-type: none"> ➤ To understand the role of HRM in an organization ➤ To learn to gain competitive advantage through people ➤ To learn to study and design HRM system ➤ Contribute to the development, implementation, and evaluation of employee recruitment, selection, and retention plans and processes ➤ Develop, implement, and evaluate employee orientation, training, and development programs. ➤ Understanding of the basic concepts, functions and processes of HRMS

193COC13 C	I	Financial Management	<ul style="list-style-type: none"> ➤ To understand various concepts related to financial management. ➤ To study in detail, various tools and techniques in the area of finance. ➤ To develop the analytical skills this would facilitate the decision making in Business situations. ➤ Create an awareness about capital structure and theories of capital structure ➤ Make them understand the cost of capital in wide aspects ➤ Provide knowledge about dividend policies and various dividend models. ➤ Enable them to understand working capital management
-----------------------------	----------	----------------------	--



Mapping of COs and POs

B.Com (Commerce) 2029 Regulations

Sem	Course Code	Title of the Course	COs	POS					
				PO1	PO2	PO3	PO4	PO5	PO6
I	19110AEC11	Tamil-I	CO:1 Learn the changes occurred in literature since classical period.	*	*				
			CO:2 Make use of vocabulary systematically.	*					
			CO:3 Understand how to lead one's life realizing the modernity and its environment/atmosphere.	*	*	*			
	19111AEC11	Advanced English-I	CO:1 Develop vocabulary	*	*				
			CO:2 zarLearn to edit and do proof reading	*	*				
			CO:3 Read and comprehend literature	*	*	*			
	19111AEC12	English-I	CO:1 Read and comprehend literature	*	*	*			
			CO:2 Appreciate poetry and prose	*	*				
			CO:3 Familiarize students with fiction.	*	*	*			
	19161SEC13	Basic Accounting	CO:1 Understanding the fundamental of financial accounting				*	*	*
			CO:2 Develop the modern market economy				*	*	
			CO:3 prepare the different kinds of financial statement				*	*	*
			CO:4 Acquire conceptual knowledge of basics of accounting				*	*	
CO:5 Identify and analyze the reasons for the difference between cash book and pass book balances							*	*	

		CO:6 Develop the skill of recording financial transactions and preparation of reports in accordance with GAAP				*	*	*
19161SEC14	Business Environment	CO:1 Discuss the supply and demand theory and its impact on insurance				*	*	
		CO:2 outline an how entity operate in the Business environment			*	*		
		CO:3 Explain the legal frame work that regulate the insurance industry					*	*
		CO:4 Understand relationship between environment and business; Applying the environmental analysis techniques in practice						*
		CO:5 Understand Economic, Socio-Cultural and Technological Environment				*		*
		CO:6 Know state policies Economic legislations and Economic reforms laid by the government						
19161AEC15	Marketing	CO:1 Understand fundamental marketing concepts, theories and principles in areas of marketing policy				*		*
		CO:2 Apply the knowledge, concepts, tools necessary to understand challenges				*	*	*
		CO:3 Understand the marketing concepts and its evolution				*		*
		CO:4 Analyze the market based on segmentation, targeting and positioning				*	*	*
		CO:5 Know the consumer behavior and their decision making process				*	*	*
		CO:6 Understand the rural markets and the contemporary issues in marketing				*	*	*
		Co:7 Make decisions on product, price , promotion mix and distribution				*		*
19161AEC16	Business Economics	CO:1 Apply the concept of opportunity cost.				*	*	*
		CO:2 understand the concepts of cost, nature of production and its relationship to Business operations.				*	*	*

		CO:3 Apply Economic theories to business decision				*		*
		CO:4 Use the theoretical concept of demand and supply analysis in practice				*	*	
		CO:5 Understand the cost concepts, theories of profit and business cycles				*	*	*
		CO:6 Use different demand forecasting techniques and apply different pricing techniques in business				*		*
		CO:7 Understand the importance of Fiscal policy				*		*
19111SEC01L	Package Lab I (Microsoft office)	1. Recognize when to use each of the Microsoft Office programs to create professional and academic documents.						*
		2. Use Microsoft Office programs to create personal, academic and business documents following current professional and/or industry standards.					*	*
		3. Apply skills and concepts for basic use of computer hardware, software, networks, and the Internet in the workplace and in future coursework as identified by the internationally accepted Internet and Computing Core (IC3) standards.					*	*
19111SEC01L	Communicative English Lab-I	CO:1 Learn grammar.	*	*	*			
		CO:2 Enrich vocabulary	*	*	*			
		CO:3 Understand the process of communication	*	*	*			
		CO:4 Develop listening skill	*	*	*			
191INDCONS	Indian Constitution	CO:1 Democratic values and citizenship Training are gained.				*		
		CO:2 Awareness on Fundamental Rights are established				*		
		CO:3 Learn the functions of union and State Governments		*	*			
		CO:4 In the power and functions of the Judiciary		*	*			

			CO:5 Understand the structure and composition of Indian Constitution		*	*			
			Co:6 Understand and analyse federalism in the Indian contex		*	*			
			CO:7 Analyse Panchayathi Raj institutions as a medium of decentralization		*	*			
II	19110AEC21	Tamil II	CO:1 Know what devotion really is.	*	*				
			CO:2 Know the fruitfulness obtained through devotion.	*	*				
			CO:3 Perceive the progress achieved in the society through devotion.	*		*			
	19111AEC21	Advanced English-II	CO:1 Develop technological skill.	*	*	*			
			CO:2 Able to write in a variety of formats	*	*	*			
			CO:3 Read biographies and develop personality	*	*	*			
	19111AEC22	English-II	CO:1 Appreciate different forms of literature		*	*			
			Co:2 Acquire language skills through literature	*		*			
			Co:3 Broadens the horizon of knowledge	*		*			
	19161SEC23	Business Accounting	CO:1 familiarize the concept of Branch account and its system				*	*	*
			CO:2 understand the Scope of departmental accounting				*	*	
			CO:3 Appreciate the need for negotiable instruments and procedure of accounting for bills honoured and dishonoured				*	*	
			CO:4 Differentiate Trade bills from Accommodation Bills				*	*	*
			CO:5 Understand the concept of Consignment and learn the accounting treatment of the various aspects of consignment				*	*	
CO:6 Distinguish Joint Venture and Partnership and to learn the methods of maintaining records under Joint Venture						*	*		
CO:7 Understand the meaning and features of Non-Profit Organisations						*	*	*	

		CO:8 Learn to prepare Receipts & Payment Account, Income & Expenditure Account and Balance Sheet for Non-Profit Organizations				*	*	*
19161SEC24	Ethics in Business	CO:1 Understand, and evaluate various organizational influences affecting ethical decisions			*	*		
		CO:2 Present and analyze ethical and moral issues			*	*		
		CO:3 Explore ethical theories			*	*		
		CO:4 Use contemporary and classical frameworks to analyze and suggest resolutions to ethical dilemmas.			*	*		
		CO:5 Identify and address common ethical issues that arise for individuals, managers, and organizations.			*	*		
		CO:6 Recognize how individual differences and cognitive barriers can influence ethical judgment.			*	*		
		CO:7 Identify and prioritize personal values and apply those to making ethical decisions.			*	*		
19161AEC25	Business Statistics	CO:1 Critically evaluate the underlying assumptions of analysis tools				*	*	
		CO:2 Solve a range of problems using the techniques covered				*	*	
		CO:3 Conduct basic statistical analysis of data.				*	*	
		CO:4 Understand basic statistical concepts such as statistical collection, statistical series, tabular and graphical representation of data				*	*	
		CO:5 Calculate measures of central tendency, dispersion and asymmetry, correlation and regression analysis				*	*	
		CO:6 Choose a statistical method for solving practical problems				*	*	
19161AEC26		CO: 1 Understand the dynamics of marketing in business				*	*	*

		CO:2 ability and confidence to tackle common practical financial problems of business.				*	*	*
		CO:3 Understand the scope of Business, and its importance.				*	*	*
	Business Organization and Management	CO:4 Identify different forms of business organizations viz; Sole Proprietorship, Partnership, Joint Hindu Family Business & Co-operative Organizations.				*	*	
		CO:5 Understand a Joint Stock Company and various formalities to promote a Company				*	*	
		CO:6 Learn various sources Industrial Financial resources and the means to raise them				*	*	*
19111SEC02L	Package Lab II (power point)	CO:1. Identify the names and functions of the PowerPoint interface.		*	*			
		CO:2. Create, edit, save, and print presentations.		*	*			
		CO:3. Format presentations.		*	*			
		CO:4. Add a graphic to a presentation.		*	*			
		CO:5. Create and manipulate simple slide shows with outlines and notes.		*	*			
		CO:6. Create slide presentations that include text, graphics, animation, and transitions.		*	*			
19111SEC02L	Communicative English Lab-II	CO:1 Learn grammar.	*	*	*			
		CO:2 Use a variety of reading strategies	*	*				
		CO:3 Enhance the skill of making grammatically correct sentences.	*	*	*			
		Co:4 Develop listening skill	*	*	*			
19111RLC27	Research Led seminar	CO:1 Know the emerging areas in research	*	*	*			
		CO:2 learning experiences of students subject to research led teaching			*	*		
		CO:3 The institutional and organisation issues surrounding such learning environments			*	*		
		CO:4 The development of such teaching on the disciplinary (subject-based) requirements of curricula design			*	*		

			CO:5 The opportunity to develop high level transferable skills			*	*		
			CO:6 The possibility of a constructive alignment between the learning, teaching and assessment of the modules			*	*		
III	19110AEC31	Tamil III	CO:1 Achieve one's goal by following the ancestral path		*	*			
			CO:2 Learn to lead life of perfection by realizing the uncertainty in the life		*	*			
			CO:3 Attain happiness through honesty		*	*			
	19111AEC31	Advanced English-III	CO:1 Understand phonetics.	*	*	*			
			CO:2 Develop writing skill	*	*	*			
			CO:3 Able to develop creative writing	*	*	*			
	19111AEC32	English-III	CO:1 Enable to appreciate different types of prose	*	*				
			CO:2 Develop the conversational skills through one-act plays	*					
			CO:3 Enhance the skill of making grammatically correct sentences.	*	*	*			
	19161SEC33	Cost Accounting	CO:1 Understand various costing systems and management systems				*	*	*
			CO:2 Analyse and provide recommendations to improve the operations of organisations				*	*	
			CO:3 Imbibe conceptual knowledge of cost accounting.				*	*	
			CO:4 Understand the significance of cost accounting in the modern economic environment				*	*	
			CO:5 Select the costs according to their impact on business				*	*	*
CO:6 Apply cost accounting methods to evaluate and project business performance						*	*	*	
19161SEC34	Banking Theory law and Practices	CO:1 Understanding of Banking Channels and Payments				*	*		
		CO:2 Practices on Banking Technology				*	*	*	

		CO:3 Understanding of Core Banking				*	*	*
		CO:4 To gather knowledge on banking and financial system in India				*	*	*
		CO:5 Understand better customer relationship				*	*	*
		CO:6 To create awareness about modern banking services like e-banking, m-banking and internet banking				*	*	*
19161AEC35	Business Law for Managers	CO:1 Explain the concepts in business laws with respect to foreign trade			*	*	*	
		CO:2 Apply the global business laws to current business environment				*	*	
		CO:3 Demonstrate an understanding of the Legal Environment of Business.				*	*	
		CO:4 Communicate effectively using standard business and legal terminology.			*	*	*	
		CO:5 Demonstrate recognition of the requirements of the contract agreement			*	*	*	
		CO:6 Identify contract remedies				*	*	
		CO:7 Understand the various provisions of Company Law			*	*	*	
19161AEC36	Essentials of Business Communication	CO:1 Identify ethical, legal, cultural, and global issues affecting business communication.			*	*		
		CO:2 Utilize analytical and problem solving skills appropriate to business communication.	*		*	*	*	
		Co:3 Effective business writing	*	*	*			
		CO:4 Research approaches and information collection.			*	*		
		CO:5 Developing and delivering effective presentations			*	*		
		CO:6 Effective interpersonal communications	*		*			
		CO:7 Skills that maximise team effectiveness.			*	*		*
		CO:8 Good time management.					*	*

19111RMC37	Research Methodology	CO:1 Able to carry out independent literature survey corresponding to the specific publication type and assess basic literary research tools.			*			
		CO:2 familiarize participants with basic of research and the research process.			*	*		
		CO:3 enable the participants in conducting research work and formulating research synopsis and report.			*			
		CO:4 Develop understanding on various kinds of research, objectives of doing research, research process, research designs and sampling.			*			
		CO:5 Have basic knowledge on qualitative research techniques			*			
		CO:6 Have adequate knowledge on measurement & scaling techniques as well as the quantitative data analysis			*			
		CO:7 Have basic awareness of data analysis-and hypothesis testing procedures			*			
19111SEC03L	Package lab III (Microsoft excel)	CO:1. Indicate the names and functions of the Excel interface components.	*	*				
		CO:2. Enter and edit data.	*					
		CO:3. Format data and cells.	*					
		CO:4. Construct formulas, including the use of built-in functions, and relative and absolute references.	*					
		CO:5. Create and modify charts.	*					
		CO:6. Preview and print worksheets.	*					
19111SEC03L	Communicative English Lab-III	CO:1 Learn grammar.	*	*	*			
		CO:2 Enhance their fluency in English	*	*	*			
		CO:3 Develop speaking and writing skills	*	*	*			
		CO:4 Develop individual perspectives that demonstrate critical thinking skills	*	*	*			
IV	19110AEC41	Tamil IV	CO:1 Realize how the ancient people changed their life style according to the ages		*	*		

		CO:2 Learn how to change one's lifestyle according to the needs of the future		*	*			
		CO:3 Accept the modern trends and its uses		*	*			
19111AEC41	Advanced English-IV	CO:1 Develop writing skill.	*	*	*			
		CO:2 Comprehend and describe poems	*	*	*			
		CO:3 Learn interviewing skills	*	*	*			
19111AEC42	English-IV	CO:1 Improve their ability to read and understand them	*	*	*			
		CO:2 Know the genius of Shakespeare	*	*	*			
		CO:3 Express in writing their views.	*	*	*			
19161SEC43	Partnership Accounting	CO:1 Understand the concept of partnership				*	*	*
		CO:2 Understand the journal entries for the formation of partnership				*	*	*
		CO:3 Familiarize the concept of Branch account and its system				*	*	
		CO:4 Understand the Scope of departmental accounting				*	*	
		CO:5 Introduce the system of Hire Purchasing				*	*	
		CO:6 Understand partnership account from admission to dissolution				*	*	
19161SEC44	Advertising and Sales Promotion	CO:1 Understand the key principles and tools of integrated marketing communication				*	*	
		CO:2 Explain the environmental factors which influence consumer and organizational decision				*	*	*
		CO:3 Identify the elements of the communication process between buyers and sellers in business. making process				*	*	*
		CO:4 Identify the marketing mix components in relation to market segmentation				*	*	
		CO:5 Outline a marketing plan				*	*	
		CO:6 Utilize marketing research techniques to resolve into competitive marketing decisions.				*	*	*

19161AEC45	Company Law and Secretarial Practices	CO:1 Get a basic understanding of different type of meeting of board of directors.				*	*	
		CO:2 Use international trade terms and concepts when communicating.	*		*	*		
		CO:3 Demonstrate comprehensive knowledge and understanding of social and economic policy considerations arising in this area.				*	*	
		CO:4 Understanding of those areas of company law identified in the indicative syllabus above and form a critical judgement on areas of controversy within the topics studied;				*	*	
		CO:5 Read and study primary and secondary sources of company law, with minimal staff guidance; critically analyse, interpret, evaluate and synthesise information from a variety of sources				*	*	*
		CO:6 Identify sources for research and further develop a strategy for research using standard and electronic research toolsC				*	*	
19120SEC04A	Packages Lab-IV	CO:1 Examine database concepts and explore the Microsoft Office Access environment.		*				
		CO:2. Design a simple database.		*				
		CO:3. Build a new database with related tables.		*				
		CO:4. Manage the data in a table.		*				
		CO:5. Query a database using different methods.		*				
		CO:6. Design a form.		*				
		CO:7. Generate a report.		*				
		CO:8. Import and export data.		*				
19111SEC04L	Communicative English Lab-IV	CO:1 Learn grammar.	*	*	*			
		CO:2 Enable to express their views in conversation	*	*				
		CO:3 Develop soft skills	*	*				
		Co:4 ce presentation skills	*	*				

191ENVTSTU	Environmental Studies	CO:1 Learn about environmental pollution.		*	*			
		CO:2 Familiarize with the social issues and the environment		*	*			
		CO:3 will be able to do independent research on human interactions with the environment.		*	*			
		CO:4 To recognize the physical, chemical, and biological components of the earth's systems and show how they function		*	*			
		CO:5 Analyze and evaluate ideological and philosophical approaches used to understand environmental relationships.		*	*			
		CO:6 Carry out an applied research project in the natural sciences.		*	*			
19161SEC51	Corporate accounting	Co:1 Find out how can a company dissolve.				*	*	
		CO:2 Understand Mutual funds investments.				*	*	*
		CO:3 Learn about Working format of companies.				*	*	
		CO:4 Enabling the students to understand the features of Shares and Debentures				*	*	
		CO:5 Develop an understanding about redemption of Shares and Debenture and its type				*	*	*
		CO:6 Exposure to the company final accounts				*	*	*
19161SEC52	Financial Management	CO:1 Use business finance terms and concepts when communicating.	*				*	*
		CO:2 Demonstrate a basic understanding of financial management.				*	*	*
		CO:3 Provide introduction to Financial Management				*	*	*
		CO:4 Create an awareness about capital structure and theories of capital structure				*	*	
		CO:5 Make them understand the cost of capital in wide aspects				*	*	
		CO:6 Provide knowledge about dividend policies and various dividend models.				*	*	
		CO:7 Enable them to understand working capital management				*	*	
V								

19161SEC53	Financial Services	CO:1 Forecast a firm's future financing requirements				*	*	*
		CO:2 Design an optimal capital structure.				*	*	
		CO:3 Give an idea about fundamentals of financial services and players in financial sectors				*	*	
		CO:4 Create an awareness about merchant banking, issue management, capital markets and role of SEBI				*	*	
		CO:5 Provide knowledge about leasing and hire purchase concepts				*	*	*
		CO:6 Make them understand about different types of insurance and IRDA Act.				*	*	
19161AEC54	Computer Application in Business	Co1:Study the development of computers and their components in each stage.						*
		CO2 : Develop an idea of software, programming language and operating system.		*				
		CO3 : Study the concept of developing database and its maintenance using computers in a business Concern				*		*
		CO4 :Analyze the importance of management information system and networking in a business.				*	*	*
		CO5 : Be aware and perform various activities using computers in day to day life.				*	*	*
19161DSC55A	Co-operative law and practices	CO:1 Know about the company law in the India.				*	*	
		CO:2 Understand the use of the memorandum of association and article of association in a company, they also learn from this course				*	*	
		CO:3 Develop Professionals in the filed of Co-operation, Co-operative law and Management.				*	*	
		CO:4 Promote qualified, Skilled and professional manpower to manage the affairs of the Cooperative Institutions.				*	*	*
		CO:5 Enhance the Knowledge base of the in-service Personnel on the subject Co-operation, Co-operative law and Co-operative Management.				*	*	*

			CO:6 Enable the in-service personnel to develop skills on Co-operative Management Techniques				*	*		
19111BRC56	Participation in Bounded Research		CO:1 Do the allotted work in research				*			
			CO:2 Learn to do review of literature				*			
			CO:3 Demonstrate knowledge of research processes					*		
			CO:4 Perform literature reviews using print and online database					*		
			CO:5 Identify, explain, compare, and prepare the key elements of a research proposal/report					*		
			CO:6 Describe sampling methods, measurement scales and instruments, and appropriate uses of each					*		
191SEC05A	Package lab V		CO:1 work with the Photoshop workspace		*					
			CO:2. navigate images		*					
			CO:3. resize and crop images		*					
			CO:4. make and work with selections		*					
			CO:5. create new layers and perform other basic layer functions		*					
			CO:6. transform images		*					
19111SEC05L	Communicative English Lab-V		CO:1 Develop corporate skills.		*		*			
			CO:2 Handle their day to day affairs well with their knowledge of language skills.	*	*		*			
VI	19161SEC61	Management Accounting	CO:1 Prepare analysis of various special decisions, using relevant costing and benefits				*	*	*	
			CO:2 More effective planning and control systems				*	*		
			CO:3 The students thought and knowledge on management Accounting				*	*		
			CO:4 Helps to give proper idea on financial statement analysis in practical point of view				*	*	*	
			CO:5 Introduce the concept of fund flow and cash flow statement				*	*		

		CO:6 Provide knowledge about budget control keeping in mind the scope of the concept				*	*	
		CO:7 Develop the know-how and concept of marginal costing with practical problems				*	*	*
19161SEC62	Entrepreneurship and small Business Management	CO:1 Understand the systematic process to select the business ideas.				*	*	*
		CO:2 Write a business plan		*		*	*	*
		CO:3 Develop students about Entrepreneurship development				*	*	*
		CO:4 Create an awareness on various Entrepreneurship Development Programme				*	*	*
		CO:5 Enable them to understand project formulation				*	*	*
		CO:6 Familiarize the students with EDP schemes				*	*	*
19161SEC63	Auditing	CO:1 Articulate knowledge of fundamental audit concepts				*	*	
		CO:2 Apply critical thinking skills and solve auditing Problems.				*	*	*
		CO:3 Apply and demonstrate the accounting knowledge and skills in Auditing.				*	*	*
		CO:4 Explain how analytical procedures are used as an audit tool.				*	*	
		CO:5 Illustrate effective internal controls				*	*	
		CO:6 Apply ethical standards to issues in auditing				*	*	
19161DSC64A	Income Tax Law & Practices	CO:1 File IT Return on individuals basis				*	*	*
		CO:2 Compute the total Income and Define tax complicacies and structure.				*	*	*
		CO:3 In order to familiarize the different know-how and heads of income with its components				*	*	*
		CO:4 It helps to build an idea about income from house property as a concept				*	*	*
		CO:5 It give more idea about the income from business or profession				*	*	*

		CO:6 Make the students familiarizes with the concept of depreciation and its provisions				*	*	*
19161DSC64B	Cooperation Theory	CO:1 Greater Social support			*	*	*	
		CO:2 More on-task behaviour				*	*	*
		CO:3 Develop Professionals in the filed of Co-operation, Co-operative law and Management.				*	*	*
		CO:4 Promote qualified, Skilled and professional manpower to manage the affairs of the Cooperative Institutions.				*	*	*
		CO:5 Enhance the Knowledge base of the in-service Personnel on the subject Co-operation, Co-operative law and Co-operative Management.				*	*	*
		CO:6 Enable the in-service personnel to develop skills on Co-operative Management Techniques				*	*	*
19161OEC	Banking Services	CO:1 To help to gather knowledge on banking and financial system in India						
		CO:2 To provide knowledge about commercial banks and its products				*	*	*
		CO;3 Aim to familiarize banking system in India				*	*	*
		CO:4 To enable them to understand better customer relationship			*	*	*	*
		CO:5 To create awareness about modern banking services like e-banking,m-banking and internet banking, ATM System				*	*	*
		CO:6 To introduce recent trends in banking system				*	*	*
		CO:7 To make the student understand the basic concept of banking and financial institutions and expose various types of risk based by banks				*	*	*
19161PRW66	Project Work	CO:1 Develop plans with relevant people to achieve the project's goals						
		CO:2 Break work down into tasks and determine handover procedures						
		CO:3 Identify links and dependencies, and schedule to achieve deliverables						

			CO:4 Estimate and cost the human and physical resources required, and make plans to obtain the necessary resources							
			CO:5 Allocate roles with clear lines of responsibility and accountability.							
			CO:6 Have adequate knowledge on measurement & scaling techniques as well as the quantitative data analysis							
	191SBE06L	Package lab VI	CO:1. Learn to create animated graphics add sound and interactivity.		*					
			CO:2. Can develop Website		*					
			CO:3. CD based presentations		*					
	19111SEC06L	Communicative English Lab-VI	CO:1 Get a job	*	*	*				
			CO:2 Apply study skills	*	*					
			CO:3 Widen creative thinking	*	*	*				
			CO:4 Be a good team worker	*	*	*				
			CO:5 Make them proficient in English	*	*	*				

B.Com CA (2019 Regulations)

Sem	Course Code	Title of the Course	COs	POS							
				PO1	PO2	PO3	PO4	PO5	PO6	PO7	
I	19110AEC11	Tamil-I	CO:1 Learn the changes occurred in literature since classical period.	*	*						
			CO:2 Make use of vocabulary systematically.	*	*						
			CO:3 Understand how to lead one's life realizing the modernity and its environment/atmosphere.	*	*						
	19111AEC11	Advanced English-I	CO:1 Develop vocabulary	*	*						
			CO:2 zarLearn to edit and do proof reading	*	*						
			CO:3 Read and comprehend literature	*	*						
19111AEC12	English-I	CO:1 Read and comprehend literature	*	*							

		CO:2 Appreciate poetry and prose	*	*						
		CO:3 Familiarize students with fiction.	*	*						
19198SEC13	Financial Accounting	CO:1 Understanding the fundamental of financial accounting		*	*	*		*		
		CO:2 Develop the modern market economy		*	*	*				
		CO:3 prepare the different kinds of financial statement		*	*	*		*		
		CO:4 Acquire conceptual knowledge of basics of accounting		*	*	*		*		
		CO:5 Identify and analyze the reasons for the difference between cash book and pass book balances		*	*			*		
		CO:6 Develop the skill of recording financial transactions and preparation of reports in accordance with GAAP		*	*			*		
19198SEC14	Business Management	CO:1 Apply conceptual learning skills in today's business environment.		*	*		*			
		CO:2 Analyze financial performance of an organization.		*	*		*			
		CO:3 Evaluate organizational decisions with consideration of the political, legal and ethical aspects of business.		*	*		*			
		CO:4 Understand relationship between environment and business; Applying the environmental analysis techniques in practice		*	*		*			
		CO:5 Assess strengths, weaknesses, opportunities and threats of the business environment.		*	*		*			
		CO:6 Know state policies Economic legislations and Economic reforms laid by the government		*	*		*			
19198AEC15	Information Technology	CO:1 Perform end user support including identifying and implementing solutions to user requests.		*	*		*	*		
		CO:2 Analyze technical requirements to determine resource requirements and the impact the solution will have on an organization.		*	*		*	*		

		CO:3 Design, plan, budget and propose an IT project for an identified need within a specific scope.		*	*		*	*	
		CO:4 Install technical hardware and software including network, database and security components.		*	*		*	*	
		CO:5 Perform routine maintenance to maintain the currency of an operating system, network, database and security needs.		*	*		*	*	
		CO:6 Identify and resolve technical problems using trouble-shooting and research techniques.		*	*		*	*	
		Co:7 Analyze and select application and operating system settings to create an optimal user environment.		*	*		*	*	
19198AEC16	Operating System	CO:1 Describe and explain the fundamental components of a computer operating system. [ABET (a), (i), (j), (k)] Assessment: Students will take midterm exams, final exams, and homework		*	*		*		
		CO:2 Describe and explain the fundamental components of a computer operating system. [ABET (a), (i), (j), (k)] Assessment: Students will take midterm exams, final exams, and homework.		*	*		*		
		CO:3 Define, restate, discuss, and explain the policies for scheduling, deadlocks, memory management, synchronization, system calls, and file systems. [ABET (a), (i), (j), (k)] Assessment: Students will take midterm exams, final exams, and homework.		*	*	*	*		
		CO:4 Describe and extrapolate the interactions among the various components of computing systems. [ABET (a), (i), (j), (k)] Assessment: Students will take midterm exams, final exams, and homework		*	*		*		

		<p>CO:5 Design and construct the following OS components: System calls, Schedulers, Memory management systems, Virtual Memory and Paging systems. [ABET (a), (c), (i), (j), (k)] Assessment: Students will design and implement the above OS components within NACHOS with C++.</p>	*	*	*	*		
		<p>CO:6 Illustrate, construct, compose and design solutions via C/C++ programs, and through NACHOS. [ABET (a), (c), (i), (j), (k)] Assessment: Students will design and implement the above OS components within NACHOS</p>	*	*	*	*		
		<p>CO:7 Measure, evaluate, and compare OS components through instrumentation for performance analysis. [ABET (b), (j)] Assessments: (1) Students will run experiments on their own implemented OS components and the components provided by NACHOS and (2) Students will perform scientific analysis on the performance of the components and are asked to submit a short paper on their experimental results.</p>	*	*	*	*		
19111SEC01L	Package Lab I (Microsoft office)	<p>1. Recognize when to use each of the Microsoft Office programs to create professional and academic documents.</p>	*	*		*		
		<p>2. Use Microsoft Office programs to create personal, academic and business documents following current professional and/or industry standards.</p>	*	*	*	*		
		<p>3. Apply skills and concepts for basic use of computer hardware, software, networks, and the Internet in the workplace and in future coursework as identified by the internationally accepted Internet and Computing Core (IC3) standards.</p>	*	*	*	*		

	19111SEC01L	Communicative English Lab-I	CO:1 Learn grammar.	*	*						
			CO:2 Enrich vocabulary	*	*						
			CO:3 Understand the process of communication	*	*						
			CO:4 Develop listening skill	*	*						
	191INDCONS	Indian Constitution	CO:1 Democratic values and citizenship Training are gained.	*	*						
			CO:2 Awareness on Fundamental Rights are established	*	*						
			CO:3 Learn the functions of union and State Governments	*	*						
CO:4 In the power and functions of the Judiciary			*	*							
CO:5 Understand the structure and composition of Indian Constitution			*	*							
Co:6 Understand and analyse federalism in the Indian context			*	*							
II	19110AEC21	Tamil II	CO:1 Know what devotion really is.	*	*						
			CO:2 Know the fruitfulness obtained through devotion.	*	*						
			CO:3 Perceive the progress achieved in the society through devotion.	*	*						
	19111AEC21	Advanced English-II	CO:1 Develop technological skill.	*	*						
			CO:2 Able to write in a variety of formats	*	*						
			CO:3 Read biographies and develop personality	*	*						
	19111AEC22	English-II	CO:1 Appreciate different forms of literature	*	*						
			Co:2 Acquire language skills through literature	*	*						
			Co:3 Broadens the horizon of knowledge	*	*						
	19198SEC23	Partnership Accounting	CO:1 familiarize the concept of Branch account and its system		*	*	*		*		
CO:2 understand the Scope of departmental accounting				*	*	*		*			

		CO:3 Appreciate the need for negotiable instruments and procedure of accounting for bills honoured and dishonoured		*	*	*		*	
		CO:4 Differentiate Trade bills from Accommodation Bills		*	*	*		*	
		CO:5 Understand the concept of Consignment and learn the accounting treatment of the various aspects of consignment		*	*	*		*	
		CO:6 Distinguish Joint Venture and Partnership and to learn the methods of maintaining records under Joint Venture		*	*	*		*	
		CO:7 Understand the meaning and features of Non-Profit Organisations		*	*	*		*	
		CO:8 Learn to prepare Receipts & Payment Account, Income & Expenditure Account and Balance Sheet for Non-Profit Organizations		*	*	*		*	
19198SEC24	Business Law	CO:1 Explain the concepts in business laws with respect to foreign trade		*				*	
		CO:2 Apply the global business laws to current business environment		*				*	
		CO:3 Demonstrate an understanding of the Legal Environment of Business.		*				*	
		CO:4 Communicate effectively using standard business and legal terminology.		*				*	
		CO:5 Demonstrate recognition of the requirements of the contract agreement		*				*	
		CO:6 Identify contract remedies		*				*	
		CO:7 Understand the various provisions of Company Law		*				*	
19198AEC25	Programming in C	CO:1 Understanding a functional hierarchical code organization.		*				*	*
		CO:2 Ability to define and manage data structures based on problem subject domain.		*				*	*
		CO:3 Understanding a concept of object thinking within the framework of functional model.		*				*	*

		CO:4 Understanding a concept of functional hierarchical code organization.		*			*	*	
		CO:5 • Understand operators, expressions and preprocessors.		*			*	*	
		CO:6 Understand arrays , it's declaration and uses.		*			*	*	
19198AEC26L	Programming in C Lab	CO: 1 Develop their programming skills.		*			*	*	
		CO:2 Declaration of variables and constants		*			*	*	
		CO:3 3. Be familiar with programming environment with C Program structure.		*			*	*	
		CO:4 Ability to work with textual information, characters and strings.		*			*	*	
		CO:5 Understanding a defensive programming concept. Ability to handle possible errors during program execution		*			*	*	
19111SEC02L	Package Lab II (power point)	CO:1. Identify the names and functions of the PowerPoint interface.		*	*		*		
		CO:2. Create, edit, save, and print presentations.		*	*		*		
		CO:3. Format presentations.		*	*		*		
		CO:4. Add a graphic to a presentation.		*	*		*		
		CO:5. Create and manipulate simple slide shows with outlines and notes.		*	*		*		
		CO:6. Create slide presentations that include text, graphics, animation, and transitions.		*	*		*		
19111SEC02L	Communicative English Lab-II	CO:1 Learn grammar.	*	*					
		CO:2 Use a variety of reading strategies	*	*					
		CO:3 Enhance the skill of making grammatically correct sentences.	*	*					
		Co:4 Develop listening skill	*	*					
19198RLC27	Research Led seminar	CO:1 Know the emerging areas in research	*	*					
		CO:2 learning experiences of students subject to research led teaching		*				*	

			CO:3 The institutional and organisation issues surrounding such learning environments		*				*		
			CO:4 The development of such teaching on the disciplinary (subject-based) requirements of curricula design		*				*		
			CO:5 The opportunity to develop high level transferable skills		*				*		
			CO:6 The possibility of a constructive alignment between the learning, teaching and assessment of the modules		*				*		
III	19110AEC31	Tamil III	CO:1 Achieve one's goal by following the ancestral path	*	*						
			CO:2 Learn to lead life of perfection by realizing the uncertainty in the life	*	*						
			CO:3 Attain happiness through honesty	*	*						
	19111AEC31	Advanced English-III	CO:1 Understand phonetics.	*	*						
			CO:2 Develop writing skill	*	*						
			CO:3 Able to develop creative writing	*	*						
	19111AEC32	English-III	CO:1 Enable to appreciate different types of prose	*	*						
			CO:2 Develop the conversational skills through one-act plays	*	*						
			CO:3 Enhance the skill of making grammatically correct sentences.	*	*						
	19198SEC33	Cost Accounting	CO:1 Understand various costing systems and management systems		*	*				*	
			CO:2 Analyse and provide recommendations to improve the operations of organisations		*	*				*	
			CO:3 Imbibe conceptual knowledge of cost accounting.		*	*				*	
			CO:4 Understand the significance of cost accounting in the modern economic environment		*	*				*	
CO:5 Select the costs according to their impact on business				*	*				*		

		CO:6 Apply cost accounting methods to evaluate and project business performance		*	*			*	
19198SEC34	Banking Theory law and Practices	CO:1 Understanding of Banking Channels and Payments		*	*		*		
		CO:2 Practices on Banking Technology		*	*		*		
		CO:3 Understanding of Core Banking		*	*		*		
		CO:4 To gather knowledge on banking and financial system in India		*	*		*		
		CO:5 Understand better customer relationship		*	*		*		
		CO:6 To create awareness about modern banking services like e-banking, m-banking and internet banking		*	*		*		
19198AEC35	Programming in C++	CO:1 To know the proper lines of C++, Encapsulation, Inheritance and Polymorphism.		*		*	*		
		CO:2 To explain the various data types, operations and functions of C++.		*		*	*		
		CO:3 To know the concept of constructors and destructors.		*		*	*		
		CO:4 To explain the concept of inheritances, types of inheritance and polymorphism, virtual Functions.		*			*		
		CO:5 To explain the types of streams, format and format of input and output operations.		*			*		
		CO:6 To Known the procedural and object oriented paradigm with concepts of streams, classes, functions, data and objects.		*		*	*		
19198AEC36L	Programming in C++ Lab	CO:1 It provides a clear modular structure for programs which makes it good for defining abstract datatypes in which implementation details are hidden.							
		CO:2 More effort is put into the object-oriented analysis and design, which lowers the overall cost of development.		*		*	*		

		Co:3 Able to understand to write the program by using oops.		*			*	*			
		CO:4 Acquire the knowledge about extending the classes and objects.		*			*	*			
		CO:5 Able to develop the inheritance program.		*			*	*			
19198RMC37	Research Methodology	CO:1 Able to carry out independent literature survey corresponding to the specific publication type and assess basic literary research tools.		*						*	
		CO:2 familiarize participants with basic of research and the research process.		*						*	
		CO:3 enable the participants in conducting research work and formulating research synopsis and report.		*							*
		CO:4 Develop understanding on various kinds of research, objectives of doing research, research process, research designs and sampling.		*							*
		CO:5 Have basic knowledge on qualitative research techniques		*							*
		CO:6 Have adequate knowledge on measurement & scaling techniques as well as the quantitative data analysis		*							*
		CO:7 Have basic awareness of data analysis-and hypothesis testing procedures		*							*
19111SEC03L	Package lab III (Microsoft excel)	CO:1. Indicate the names and functions of the Excel interface components.		*							
		CO:2. Enter and edit data.		*							
		CO:3. Format data and cells.		*							
		CO:4. Construct formulas, including the use of built-in functions, and relative and absolute references.		*		*	*			*	
		CO:5. Create and modify charts.		*							
		CO:6. Preview and print worksheets.		*							
19111SEC03L	Communicative English Lab-III	CO:1 Learn grammar.	*	*							
		CO:2 Enhance their fluency in English	*	*							

			CO:3 Develop speaking and writing skills	*	*						
			CO:4 Develop individual perspectives that demonstrate critical thinking skills	*	*						
IV	19110AEC41	Tamil IV	CO:1 Realize how the ancient people changed their life style according to the ages	*	*						
			CO:2 Learn how to change one's lifestyle according to the needs of the future	*	*						
			CO:3 Accept the modern trends and its uses	*	*						
	19111AEC41	Advanced English-IV	CO:1 Develop writing skill.	*	*						
			CO:2 Comprehend and describe poems	*	*						
			CO:3 Learn interviewing skills	*	*						
	19111AEC42	English-IV	CO:1 Improve their ability to read and understand them	*	*						
			CO:2 Know the genius of Shakespeare	*	*						
			CO:3 Express in writing their views.	*	*						
	19198SEC43	Auditing	CO:1 Articulate knowledge of fundamental audit concepts		*	*				*	
			CO:2 Apply critical thinking skills and solve auditing Problems.		*	*				*	
			CO:3 Apply and demonstrate the accounting knowledge and skills in Auditing.		*	*				*	
			CO:4 Explain how analytical procedures are used as an audit tool.		*	*				*	
			CO:5 Illustrate effective internal controls		*	*				*	
			CO:6 Apply ethical standards to issues in auditing		*	*				*	
	19198SEC44	Business Statistics	CO:1 Critically evaluate the underlying assumptions of analysis tools		*					*	
			CO:2 Solve a range of problems using the techniques covered		*					*	
			CO:3 Conduct basic statistical analysis of data.		*					*	

		CO:4 Understand basic statistical concepts such as statistical collection, statistical series, tabular and graphical representation of data		*					*	
		CO:5 Calculate measures of central tendency, dispersion and asymmetry, correlation and regression analysis		*					*	
		CO:6 Choose a statistical method for solving practical problems		*					*	
19198AEC45	Visual Basic Programming	CO:1 Students code visual programs by using Visual Basic work environment.		*	*			*		
		CO:2 Distinguish and compose events and methods.		*	*			*		
		CO:3 Distinguish and compose events and methods.		*	*			*		
		CO:4 Recognize and arrange control structures.		*	*			*		
		CO:5 Understand development of applications.		*	*			*		
		CO:6 Identify sources for research and further develop a strategy for research using standard and electronic research toolsC		*	*			*		
19198AEC46	Visual Basic Programming Lab	CO:1 Understand an overview of computers and computer programming.		*	*			*		
		CO:2 Understand Visual Basic applications.		*	*			*		
		CO:3 Understand how to perform operations and store results.		*	*			*		
		CO:4 Understand the concept of data-driven program execution flow control in Visual Basic programming		*	*			*		
		CO:5 Understand additional Visual Basic controls.		*	*			*		
		CO:6 Understand loops to do repetition.		*	*			*		
19120SEC04A	Packages Lab-IV	CO:1 Examine database concepts and explore the Microsoft Office Access environment.		*				*		
		CO:2. Design a simple database.		*				*		
		CO:3. Build a new database with related tables.		*				*		

			CO:4. Manage the data in a table.		*			*		
			CO:5. Query a database using different methods.		*			*		
			CO:6. Design a form.		*			*		
			CO:7. Generate a report.		*			*		
			CO:8. Import and export data.		*			*		
	19111SEC04L	Communicative English Lab-IV	CO:1 Learn grammar.	*	*					
			CO:2 Enable to express their views in conversation	*	*					
			CO:3 Develop soft skills	*	*					
			Co:4 ce presentation skills	*	*					
	191ENVSTU	Environmental Studies	CO:1 Learn about environmental pollution.		*			*		
			CO:2 Familiarize with the social issues and the environment		*			*		
			CO:3 will be able to do independent research on human interactions with the environment.		*			*		
			CO:4 To recognize the physical, chemical, and biological components of the earth's systems and show how they function		*			*		
			CO:5 Analyze and evaluate ideological and philosophical approaches used to understand environmental relationships.		*			*		
			CO:6 Carry out an applied research project in the natural sciences.		*			*		
	19198SEC51	Corporate accounting	Co:1 Find out how can a company dissolve.		*	*			*	
			CO:2 Understand Mutual funds investments.		*	*			*	
			CO:3 Learn about Working format of companies.		*	*			*	
			CO:4Enabling the students to understand the features of Shares and Debentures		*	*			*	
			CO:5Develop an understanding about redemption of Shares and Debenture and its type		*	*			*	
			CO:6 Exposure to the company final accounts		*	*			*	
V	19198SEC52	Business Economics	CO:1 Apply the concept of opportunity cost.		*				*	

		CO:2 understand the concepts of cost, nature of production and its relationship to Business operations.		*					*		
		CO:3 Apply Economic theories to business decision		*					*		
		CO:4 Use the theoretical concept of demand and supply analysis in practice		*					*		
		CO:5 Understand the cost concepts, theories of profit and business cycles		*					*		
		CO:6 Use different demand forecasting techniques and apply different pricing techniques in business		*					*		
		CO:7 Understand the importance of Fiscal policy		*					*		
19198SEC53	Financial Management	CO:1 Use business finance terms and concepts when communicating.		*				*	*		
		CO:2 Demonstrate a basic understanding of financial management.		*				*	*		
		CO:3 Provide introduction to Financial Management		*					*	*	
		CO:4 Create an awareness about capital structure and theories of capital structure		*					*	*	
		CO:5 Make them understand the cost of capital in wide aspects		*					*	*	
		CO:6 Provide knowledge about dividend policies and various dividend models.		*					*	*	
19161AEC54	Software Engineering	Co1:To identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics		*		*			*		
		CO2 : To apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors		*		*		*			
		CO3 : An ability to communicate effectively with a range of audiences		*		*					

		CO4 :Analyze the importance of management information system and networking in a business.		*	*	*			
		CO5 : Be aware and perform various activities using computers in day to day life.		*	*	*			
19198DSC55A	Investment Management	CO:1 The knowledge and skills to select and employ base level tools for financial analysis.		*	*	*			
		CO:2 The knowledge and skills to analyze companies for investment purposes.		*	*	*			
		CO:3 The knowledge and skills to develop portfolio strategies for individual and institutional investors.		*	*	*			
		CO:4 The knowledge and to operate ethically as investment management professionals.		*	*	*			
		CO:5 Understand the various alternatives available for investment.		*	*	*			
		CO:6 Gain knowledge of the various strategies followed by investment practitioners		*	*	*			
19111BRC56	Participation in Bounded Research	CO:1 Do the allotted work in research		*				*	
		CO:2 Learn to do review of literature		*				*	
		CO:3 Demonstrate knowledge of research processes		*				*	
		CO:4 Perform literature reviews using print and online database		*				*	
		CO:5 Identify, explain, compare, and prepare the key elements of a research proposal/report		*				*	
		CO:6 Describe sampling methods, measurement scales and instruments, and appropriate uses of each		*	*			*	
191SEC05A	Package lab V	CO:1 Work with the Photoshop workspace		*	*				
		CO:2. Navigate images		*	*				
		CO:3. Resize and crop images		*	*				
		CO:4. Make and work with selections		*	*				

			CO:5. Create new layers and perform other basic layer functions		*	*				
			CO:6. Transform images		*	*				
	19111SEC05L	Communicative English Lab-V	CO:1 Develop corporate skills.	*	*					
			CO:2 Handle their day to day affairs well with their knowledge of language skills.	*	*					
VI	19161SEC61	Management Accounting	CO:1 Prepare analysis of various special decisions, using relevant costing and benefits		*		*		*	
			CO:2 More effective planning and control systems		*		*		*	
			CO:3 The students thought and knowledge on management Accounting		*		*		*	
			CO:4 Helps to give proper idea on financial statement analysis in practical point of view		*		*		*	
			CO:5 Introduce the concept of fund flow and cash flow statement		*		*		*	
			CO:6 Provide knowledge about budget control keeping in mind the scope of the concept		*		*		*	
			CO:7 Develop the know-how and concept of marginal costing with practical problems		*		*		*	
	19198SEC62	Income Tax Law & Practices	CO:1 File IT Return on individuals basis		*		*		*	
			CO:2 Compute the total Income and Define tax complicacies and structure.		*		*		*	
			CO:3 In order to familiarize the different know-how and heads of income with its components		*		*		*	
			CO:4 It helps to build an idea about income from house property as a concept		*		*		*	
			CO:5 It give more idea about the income from business or profession		*		*		*	
			CO:6 Make the students familiarizes with the concept of depreciation and its provisions		*		*		*	
	19198SEC63	Database Management System	CO:1 Understand database concepts and structures and query language		*	*		*		
			CO:2 Understand the E R model and relational model		*	*		*		

		CO:3 Understand Functional Dependency and Functional Decomposition.		*	*		*		
		CO:4 Apply various Normalization techniques		*	*		*		
		CO:5 Understand query processing and techniques involved in query optimization.		*	*		*		
		CO:6 Understand the principles of storage structure and recovery management.		*	*		*		
19198DSC64A	E-Commerce	CO:1 Demonstrate an understanding of the foundations and importance of E-commerce		*		*			
		CO:2 Analyze the impact of E-commerce on business models and strategy		*		*			
		CO:3 Describe the infrastructure for E-commerce		*		*			
		CO:4 Discuss legal issues and privacy in E-Commerce		*		*			
		CO:5 Assess electronic payment systems		*		*			
		CO:6 Recognize and discuss global E-commerce issues		*		*			
19198OEC	Banking Services	CO:1 To help to gather knowledge on banking and financial system in India		*		*			
		CO:2 To provide knowledge about commercial banks and its products		*		*			
		CO;3 Aim to familiarize banking system in India		*		*			
		CO:4 To enable them to understand better customer relationship		*		*			
		CO:5 To create awareness about modern banking services like e-banking,m-banking and internet banking, ATM System		*		*			
		CO:6 To introduce recent trends in banking system		*		*			
		CO:7 To make the student understand the basic concept of banking and financial institutions and expose various types of risk based by banks		*		*			
19198PRW66	Project Work	CO:1 Develop plans with relevant people to achieve the project's goals		*				*	

			CO:2 Break work down into tasks and determine handover procedures		*					*	
			CO:3 Identify links and dependencies, and schedule to achieve deliverables		*					*	
			CO:4 Estimate and cost the human and physical resources required, and make plans to obtain the necessary resources		*					*	
			CO:5 Allocate roles with clear lines of responsibility and accountability.		*					*	
			CO:6 Have adequate knowledge on measurement & scaling techniques as well as the quantitative data analysis		*					*	
	191SBE06L	Package lab VI	CO:1. Learn to create animated graphics add sound and interactivity.		*		*			*	
CO:2. Can develop Website				*		*			*		
CO:3. CD based presentations				*		*			*		
	19111SEC06L	Communicative English Lab-VI	CO:1 Get a job	*	*			*			
CO:2 Apply study skills			*	*							
CO:3 Widen creative thinking			*	*							
CO:4 Be a good team worker			*	*							
CO:5 Make them proficient in English			*	*							

M.Com (2019 Regulations)

Sem	Course Code	Title of the Course	COs	POS							
				PO1	PO2	PO3	PO4	PO5	PO6	PO7	
I	19261SEC11	Marketing Research and Consumer Behaviour	CO:1 This specialization lays the necessary groundwork for an overall successful marketing strategy	*	*					*	
			CO:2 knowledge required to understand the state of your product before approaching the market strategy	*	*					*	

		CO:3 Interpret development of marketing research	*	*					*	
		CO:4 Identify the major influences in Consumer Behaviour	*	*					*	
		CO:5 theory of Consumer behaviour and relates it to the practice of marketing.	*	*					*	
		CO: 6 Demonstrate how knowledge of consumer behaviour can be applied to marketing.	*	*					*	
19261SEC12	Human Resource Management	CO:1 Contribute to the development, implementation, and evaluation of employee recruitment, selection, and retention plans and processes	*	*				*		
		CO:2 Develop, implement, and evaluate employee orientation, training, and development programs.	*	*				*		
		CO:3 Understanding of the basic concepts,functions and processes of HRM	*	*				*		
		CO:4 develop a selection and interviewing program	*	*				*		
		CO:5 know formalize, Design and evaluate various Recruitment and Placement policies.	*	*				*		
		CO:6 Use methods of of collecting job analysis information.	*	*				*		
		CO:1 Focuses on services, service design, and service innovation, with the aim of developing empathy for customers and understanding the customer experience	*	*				*	*	
19261SEC13	Services Marketing	CO:2 strategies that support broader marketing decisions.	*	*				*		
		CO:3 Develop an understanding of the role of relationship marketing and customer service	*	*				*		

		CO:4 Demonstrate a knowledge of the extended marketing mix for services.	*	*			*	*	
		CO:5 Exhibit the capability to work effectively within a team environment.	*	*			*		
		CO:6Develop and Justify marketing planning and Control Systems.	*	*			*		
19261SEC14	Advanced Cost Management	CO:1 Study of decision making and performance evaluation techniques in management accounting	*	*					
		CO:2 Understand decision making and performance evaluation techniques in management accounting.	*	*	*	*			
		CO:3 In modern competitive business environment, suitable business decision making is very crucial	*	*	*				
		CO:4 Identify relevant information for decision making purposes in order to produce financial analyses for a range of decisions such as product-mix, pricing, outsourcing and special orders.	*	*	*	*			
		CO:5 Use standard costs to prepare budgets for planning and control purposes.	*	*	*	*			
		CO:6 Understand the principles of standard costing.	*	*	*	*			
19261DSC15B	Oranizational Behaviour	CO:1Examine the differences and similarities between leadership, power, and management	*	*			*		
		CO:2 impact that a company's structure and design can have on its organizational behavior	*	*			*		
		CO:3 impact of culture on organizational behavior	*	*			*		
		CO:4 Analyze management issues as related to organizational behavior	*	*			*		
		CO:5Examine challenges of effective organizational communication	*	*			*		
		CO:6 Evaluate ethical issues as related to organizational behavior	*	*			*		
19261RLS16	Research Led Seminar	CO:1 Develop skills in data collection and complex analysis					*		

			CO:2 Clarify terminology and approaches to different facets of research-based teaching	*	*						
			CO:3 Explore good practices in institution-driven, strategic approaches on how to integrate research and education missions	*	*						
			CO:4 Generate ideas on how to build the capacity of faculty members to implement researchbased teaching	*	*						
			CO:5 create a research-based learning environment	*	*						
			CO:6 Analyse national frameworks, policies and funding	*	*						
ii	19261SEC21	Quantitative Techniques for Decision Making	CO:1 Employ basic statistical methods to decision making	*	*						
			CO:2 Understand how to apply basic models and theories in business	*	*		*				
			CO:3 Solve management problems effectively	*	*		*				
			CO:4 Use software tools to model decision problems.	*	*						
			CO:5 Clearly identify an otherwise unstructured business problem and its components	*	*		*				
			CO:6 Employ effective techniques for addressing the major challenges presented	*	*						
			CO:7 Provide a solution to the decision process	*	*		*				
	19261SEC22	Total Quality Management	CO:1 Given a product or a service type, the student manager will be able to enumerate and justify the dimensions of product quality or service quality for the same	*	*				*		
			CO:2 Given the quality gurus (Deming/ Juran/ Taguchi/ Crosby), the student manager will be able to justify their philosophies/ contributions in Quality Management.	*	*					*	
			CO:3 Given a quality problem/ failure mode, the student manager will be able to identify causes	*	*					*	

		and sub causes of the effect/ problem draw and justify Ishikawa Diagram.							
		CO:4 For a given type of organization, the student manager will be able to enlist and justify the four levels of benchmarking and/ or enlist and brief seven step benchmarking model	*	*			*		
		CO:5 The student manager will be able to differentiate between common and special cause of variation and/ or differentiate between attributes and variables and/ or construct and write formulae for control charts for variables and attributes.	*	*			*		
		CO:6 Critically appraise the organisational, communication and teamwork requirements for effective quality management	*	*			*		
19261SEC23	Advanced Management Accounting	CO:1 Activity based approaches to management and cost analysis	*	*	*	*			
		CO:2 Analysis of common costs in manufacturing and service industry	*	*	*	*			
		CO:3 Techniques for profit improvement, cost reduction, and value analysis	*	*	*	*			
		CO:4 Throughput accounting	*	*	*				
		CO:5 Target costing; cost ascertainment and pricing of products and services	*	*	*	*			
		CO:6 Pricing Decisions	*	*	*	*			
		CO:7 Budgets and Budgetary Control	*	*	*	*			
		CO:8 Evolution of standards, continuous - improvement; keeping standards meaningful and relevant; variance analysis	*	*	*	*			
		CO:6 Distinguish Joint Venture and Partnership and to learn the methods of maintaining records under Joint Venture	*	*	*	*			
		CO:7 Understand the meaning and features of Non-Profit Organisations	*	*	*				

		CO:8 Learn to prepare Receipts & Payment Account, Income & Expenditure Account and Balance Sheet for Non-Profit Organizations	*	*	*	*				
19261SEC24B	Retail Management	CO:1 The role that retailing plays in the distribution component of the marketing mix	*	*			*			
		CO:2 Understanding of the concept of social responsibility and the role it plays in retailin	*	*			*			
		CO:3 Aware of the moral and ethical dilemmas that face the retailing industry in today’s business environment	*	*			*			
		CO:4 Development and understanding of implementing a retail strategy.	*	*			*			
		CO: 5 Understanding of the increased use of technology in the field of retailing	*	*			*			
		CO:6 Identify key roles within retail businesses	*	*			*			
19261RMC25	Research Methodology	CO:1 Demonstrate knowledge of research processes (reading, evaluating, and developing)	*	*		*				
		CO:2 Perform literature reviews using print and online databases	*	*		*				
		CO:3 Identify, explain, compare, and prepare the key elements of a research proposal/report	*	*		*				
		CO:4 Select and define appropriate research problem and parameters	*	*		*				
		CO:5 Prepare a project proposal (to undertake a project)	*	*		*				
		CO:6 Understand some basic concepts of research and its methodologies	*	*		*				
19261BRC26	Participation in Bounded Research	CO:1 Develop understanding on various kinds of research, objectives of doing research, research process, research designs and sampling.	*	*		*				
		CO:2 Have basic knowledge on qualitative research techniques	*	*		*				
		CO:3Have adequate knowledge on measurement & scaling techniques as well as the quantitative data analysis	*	*		*				

			CO:4 Have basic awareness of data analysis-and hypothesis testing procedures	*	*		*			
			CO:5 knowledge for enabling students to develop data analytics skills and meaningful interpretation to the data sets so as to solve the business/Research problem.	*	*		*			
			CO:6 Describe sampling methods, measurement scales and instruments, and appropriate uses of each	*	*		*			
III	19261SEC31	Project planning and Control	CO:1 Understand the How Subcontract Administration and Control are practiced in the Industry.	*	*				*	
			CO:2 Understand the contract management, Project Procurement, Service level Agreements and productivity	*	*				*	
			CO:3 Apply the risk management plan and analyse the role of stakeholders.	*	*				*	
			CO:4 Analyze the learning and understand techniques for Project planning, scheduling and Execution Control.	*	*			*		
			CO:5 Understand the conceptual clarity about project organization	*	*				*	
			CO:6 Understand project characteristics and various stages of a project	*	*			*		
	19261SEC32	Advanced Corporate Accounting	CO:1 Critically analyse both older and newer MA methods and their effects in organisations	*	*	*	*			
			CO:2 knowledge and understanding about MA issues, including its problems and difficulties	*	*	*	*			
			CO:3 Part in the design and use of the management accounting system in organisations	*	*	*	*			
			CO:4 Updated concerning the more recent development in MA and the emergence of new methods	*	*	*	*			
			CO:5 More advanced level compared to the basic knowledge acquired on the Bachelor level	*	*	*	*			
			CO:6 Exposure to the company final accounts	*	*	*	*			

19261DSC34B	Indian Financial System	CO:1 Knowledge, understanding and skills in the area of international financial relations and tolls for its implementation	*	*	*				*		
		CO:2 Knowledge and understanding of characteristics, activities, principles and specifics of international financial relations	*	*					*		
		CO:3 Ability to summarize and critically evaluate results obtained by researchers in the field of international financial relations	*	*						*	
		CO:4 Ability to analyse and use various sources of information and data in the field and make assessment	*	*						*	
		CO:5 Use methods in the field of international finance in practice;	*	*						*	
		CO:6 Economic essence and currency classifications: the concept of currency and its basic classification; characteristics of currencies.	*	*						*	
19261OEC	Financial Services	CO:1 To introduces meaning and functions of Financial Intermediaries	*	*	*						
		CO:2 To understand the role of merchant bank and its services	*	*	*						
		CO:3 To provide information regarding management of mutual funds and Regulations	*	*	*						
		CO:4 To understand the role and functions of financial services Marketing	*	*	*					*	
		CO:5 To know the structure and types of debt Instruments	*	*	*						
		CO:6 To realize Foreign Exchange Market	*	*	*					*	
19261SRC36	Scaffold Research (Societal Project)	CO:1 to help students manage individual or team projects.	*	*					*		
		CO:2 Begin project-planning with a specific audience with a specific and pressing concern	*	*					*		
		CO:3 Let students design their own projects. Or require that projects iterate or counter existing cultural trends and patterns or that address	*	*						*	

			compelling social concerns (e.g.technology addiction).								
			CO:4 Use concept-mapping before, during, and after the project is completed.	*	*			*			
			CO:5Give students the opportunities to use their specific gifts, skills, and backgrounds in completing the project.	*	*			*			
			CO:6 Help students brainstorm the opportunities for creative risk-taking at the beginning of a project.	*	*			*			
IV	19261SEC41	Income Tax Law and Tax Planning	CO:1 File IT Return on individuals basis	*	*			*			
			CO:2 Compute the total Income and Define tax complicacies and structure.	*	*			*			
			CO:3 In order to familiarize the different know-how and heads of income with its components	*	*			*			
			CO:4 It helps to build an idea about income from house property as a concept	*	*			*			
			CO:5 It give more idea about the income from business or profession	*	*			*			
			CO:6 Make the students familiarizes with the concept of depreciation and its provisions	*	*			*			
	19261SEC42	International Business	CO:1 Have developed an understanding of major issues related to international Business	*	*					*	
			CO:2 Have developed skills in researching and analyzing trends in global markets and in modern marketing practice	*	*						*
			CO:3 An organization’s ability to enter and compete in international markets.	*	*						*
			CO:4 Develop skills in researching and analyzing international Business opportunities	*	*						*
			CO:5 Develop a high level of analytical skills and critical thinking in an international Business contex	*	*						*
			CO:6 Explain the main institutions that shape the global marketplace;	*	*						*

19261SEC43	Co- Operation in India and Abroad	CO:1 Know about the company law in the Abroad.	*	*				*	
		CO:2 Understand the use of the memorandum of association and article of association in a company, they also learn from this course	*	*			*		
		CO:3 Develop Professionals in the filed of Co-operation, Co-operative law and Management.	*	*			*		
		CO:4 Promote qualified, Skilled and professional manpower to manage the affairs of the Cooperative Institutions.	*	*					
		CO:5 Enhance the Knowledge base of the in-service Personnel on the subject Co-operation, Co-operative law and Co-operative Management.	*	*			*		
		CO:6 Enable the in-service personnel to develop skills on Co-operative Management Techniques	*	*			*		
19261DSC44B	International Financial Management	CO:1 Understand international capital and foreign exchange market.	*	*		*		*	
		CO:2 Identify and appraise investment opportunities in the international environment.	*	*				*	
		CO:3 Identify risk relating to exchange rate fluctuations and develop strategies to deal with them	*	*					*
		CO:4 Identify and evaluate foreign direct investment and international acquisition opportunities	*	*					*
		CO:5 Develop strategies to deal with other types of country risks associated with foreign operations	*	*					*
		CO:6 Express well considered opinion on issues relating to international financial management.	*	*		*			*
19261PRW45	Project Work	CO:1 Develop plans with relevant people to achieve the project's goals	*	*		*			
		CO:2 Break work down into tasks and determine handover procedures	*	*		*			
		CO:3 Identify links and dependencies, and schedule to achieve deliverables	*	*		*			

			CO:4 Estimate and cost the human and physical resources required, and make plans to obtain the necessary resources	*	*		*			
			CO:5 Allocate roles with clear lines of responsibility and accountability.	*	*		*			
			CO:6 Have adequate knowledge on measurement & scaling techniques as well as the quantitative data analysis	*	*		*			

2019

Sem	Course Code	Title of the Course	COs	POS						
				PO1	PO2	PO3	PO4	PO5	PO6	PO7
I	193RMG11	Research Methodology	Able to carry out independent literature survey corresponding to the specific publication type and assess basic literary research tools.	*	*			*		*
			Familiarize participants with basic of research and the research process.	*	*			*		*
			Enable the participants in conducting research work and formulating research synopsis and report.	*	*	*				*
			Develop understanding on various kinds of research, objectives of doing research, research process, research designs and sampling.	*	*	*	*			*
			Have basic knowledge on qualitative research techniques	*	*				*	*
			Have adequate knowledge on measurement & scaling techniques as well as the quantitative data analysis		*	*	*			*
			Have basic awareness of data analysis-and hypothesis testing procedures	*	*			*		*
	193COC12		To help the students gain understanding of the functions and responsibilities of managers.	*	*			*		*

		To know various tools from accounting and cost accounting this would facilitate the decision making	*	*	*				*
		To explore the economics of information and network industries and to equip students with an understanding of how economics affect the business strategy of companies in these industries.	*	*	*	*			*
	Advanced Functional Management	To provide the students with an understanding of fundamental legal issues pertaining to the business world to enhance their ability to manage businesses effectively.	*	*				*	*
		To use statistical techniques for analysis of research data		*	*	*			*
		To gain a solid understanding of human behavior in the workplace from an individual, group, and organizational perspective.	*	*			*		*
		To learn to study and design HRM system	*	*			*		*
		To understand the relationship between Operations & SCM and other business functions, such as Marketing, Finance, Accounting, and Human Resources.	*	*	*				*
193COC13	Marketing Management	To introduce the concept of Marketing Mix as a framework for Marketing Decision making.	*	*	*	*			*
		To emphasize the need, importance and process of Marketing Planning and Control.	*	*				*	*
		To sensitize the students to the dynamic nature of Marketing Function.		*	*	*			*
		Understand fundamental marketing concepts, theories and principles in areas of marketing policy	*	*			*		*
		Apply the knowledge, concepts, tools necessary to understand challenges	*	*			*		*
		Understand the marketing concepts and its evolution	*	*	*				*

		The course helped the students to know the principles and Practices of Marketing Mix and Marketing Research.	*	*	*	*			*
1923COC13	Human Resource Management	To understand the role of HRM in an organization	*	*				*	*
		To learn to gain competitive advantage through people		*	*	*			*
		To learn to study and design HRM system	*	*			*		*
		Contribute to the development, implementation, and evaluation of employee recruitment, selection, and retention plans and processes	*	*			*		*
		Develop, implement, and evaluate employee orientation, training, and development programs.	*	*	*				*
		Understanding of the basic concepts, functions and processes of HRM	*	*	*	*			*
193RPE14	Financial Management	To understand various concepts related to financial management.	*	*				*	*
		To study in detail, various tools and techniques in the area of finance.		*	*	*			*
		To develop the analytical skills this would facilitate the decision making in Business situations.	*	*			*		*
		Create an awareness about capital structure and theories of capital structure	*	*			*		*
		Make them understand the cost of capital in wide aspects	*	*	*				*
		Provide knowledge about dividend policies and various dividend models.	*	*	*	*			*
		Enable them to understand working capital management	*	*					*



PRIST
DEEMED TO BE
UNIVERSITY
NAAC ACCREDITED
THANJAVUR – 613 403 - TAMILNADU

1.1.1 Curricula developed and implemented have relevance to the local, national, regional and global developmental needs which is reflected in Programme outcomes (POs), Programme Specific Outcomes(PSOs) and Course Outcomes(COs) of the Programmes offered by the University (2UGBTGE)

Program Outcomes and Course outcomes of

Department of Management
REGULATION – 2019

LOCAL	
REGIONAL	
NATIONAL	
GLOBAL	



SCHOOL OF COMMERCE AND MANAGEMENT
DEPARTMENT OF MANAGEMENT

Programmed Offer

1	BBA	YES
2	MBA	YES

PROGRAM EDUCATIONAL OBJECTIVES

- Graduates will be expertise in the area of leadership, interpersonal skills, entrepreneurship, and marketing.
- Graduate will competent the global competitive world more professionally.
- Graduate be a responsible citizen and lead the business with moral and ethical value.

PROGRAM OUTCOMES

- Acquiring Conceptual Clarity of Various Functional Areas
- Ability to analyze various functional issues affecting the organization
- Demonstrating ability to evolve strategies for organizational benefits
- Analysis and interpretation of the data which is used in Decision Making
- Demonstrate Ability to work in Groups
- Demonstrate understanding of social cues and contexts in social interaction
- Develop Ethical Practices and Imbibe Values for Better Corporate Governance.
- Understand ethical challenges and choices in a business setting
- Demonstrate understanding of sustainability related concerns in varied areas
- Analyze Global Environment and its Impact on Business
- Understand the ecosystem of start up in the country
- Demonstrate the ability to create business plans

PROGRAM SPECIFIC OUTCOMES

- An Understanding of Business Functions
- Providing Global Perspectives
- Developing Critical and Analytical Thinking Abilities
- Interpersonal Skill Development
- Creating Social Sensitivity and Understanding CSR, Ethical and Sustainable Business Practices
- Demonstrate sensitivity to social, ethical and sustainability issues
- Developing Entrepreneurship Acumen
- Demonstrate the ability to develop models / frameworks to reflect critically on specific business contexts
- Demonstrate Effectively Oral and Written Communication

2019		BBA	
Sem	Course Code	Title of the Course	C O S
I	19110AEC11	Tamil I	CO:1 Learn the changes occurred in literature since classical period.
			CO:2 Make use of vocabulary systematically.
			CO:3 Understand how to lead one's life realizing the modernity and its environment/atmosphere.
	19111AEC12	English I	CO:1 Develop vocabulary
			CO:2 Learn to edit and do proof reading
			CO:3 Read and comprehend literature
	19160SEC13	Core - I Principles of Management	CO:1 Understanding the fundamental of financial accounting
			CO:2 Develop the modern market economy
			CO:3 prepare the different kinds of financial statement
	19160SEC14	Core - II Managerial Economics	CO:1 Understanding the fundamental of financial accounting
			CO:2 Develop the modern market economy
			CO:3 prepare the different kinds of financial statement
			CO:4 Acquire conceptual knowledge of basics of accounting
			CO:5 Identify and analyze the reasons for the difference between cash book and pass book balances
			CO:6 Develop the skill of recording financial transactions and preparation of reports in accordance with GAAP
	19160AEC15	Allied- I Business Communication	CO:1 Discuss the supply and demand theory and its impact on insurance
			CO:2 outline an how entity operate in the Business environment
			CO:3 Explain the legal frame work that regulate the insurance industry
			CO:4 Understand relationship between environment and business; Applying the environmental analysis techniques in practice
			CO:5 Understand Economic, Socio-Cultural and Technological Environment
			CO:6 Know state policies Economic legislations and Economic reforms laid by the government
19160AEC16	Allied- II Business Mathematics and Statistics	CO:1 Understand fundamental marketing concepts, theories and principles in areas of marketing policy	
		CO:2 Apply the knowledge, concepts, tools necessary to understand challenges	
		CO:3 Understand the marketing concepts and its evolution	
		CO:4 Analyze the market based on segmentation, targeting and positioning	
		CO:5 Know the consumer behavior and their decision making process	

		CO:6 Understand the rural markets and the contemporary issues in marketing
		Co:7 Make decisions on product, price, promotion mix and distribution
19120SEC01AL	Skill Based Elective Course - I	CO:1 Apply the concept of opportunity cost.
		CO:2 understand the concepts of cost, nature of production and its relationship to Business operations.
		CO:3 Apply Economic theories to business decision
		CO:4 Use the theoretical concept of demand and supply analysis in practice
		CO:5 Understand the cost concepts, theories of profit and business cycles
		CO:6 Use different demand forecasting techniques and apply different pricing techniques in business
		CO:7 Understand the importance of Fiscal policy
19111SEC01L	Communicative English Lab - I	1. Recognize when to use each of the Microsoft Office programs to create professional and academic documents.
		2. Use Microsoft Office programs to create personal, academic and business documents following current professional and/or industry standards.
		3. Apply skills and concepts for basic use of computer hardware, software, networks, and the Internet in the workplace and in future coursework as identified by the internationally accepted Internet and Computing Core (IC3) standards.
191ETHVALS	Ethics and Values	CO:1 Learn grammar.
		CO:2 Enrich vocabulary
		CO:3 Understand the process of communication
		CO:4 Develop listening skill
19110AEC21	Tamil II	CO:1 Know what devotion really is.
		CO:2 Know the fruitfulness obtained through devotion.
		CO:3 Perceive the progress achieved in the society through devotion.
19111AEC22	English II	CO:1 Develop technological skill.
		CO:2 Able to write in a variety of formats
		CO:3 Read biographies and develop personality
19160SEC23	Core - III Financial Accounting	CO:1 Appreciate different forms of literature
		Co:2 Acquire language skills through literature
		Co:3 Broadens the horizon of knowledge
19160SEC24	Core - IV Organizational Behaviour	CO:1 familiarize the concept of Branch account and its system
		CO:2 understand the Scope of departmental accounting
		CO:3 Appreciate the need for negotiable instruments and procedure of accounting for bills honoured and dishonoured
		CO:4 Differentiate Trade bills from Accommodation Bills
		CO:5 Understand the concept of Consignment and learn the accounting treatment of the various aspects of consignment
19160AEC25	Allied-III Business Environment	CO:1 Understand, and evaluate various organizational influences affecting ethical decisions

		CO:2 Present and analyze ethical and moral issues
		CO:3 Explore ethical theories

		CO:4 Use contemporary and classical frameworks to analyze and suggest resolutions to ethical dilemmas.
		CO:5 Identify and address common ethical issues that arise for individuals, managers, and organizations.
		CO:6 Recognize how individual differences and cognitive barriers can influence ethical judgment.
		CO:7 Identify and prioritize personal values and apply those to making ethical decisions.
19160AEC26	Allied-IV Management Information System	CO:1 Critically evaluate the underlying assumptions of analysis tools
		CO:2 Solve a range of problems using the techniques covered
		CO:3 Conduct basic statistical analysis of data.
		CO:4 Understand basic statistical concepts such as statistical collection, statistical series, tabular and graphical representation of data
		CO:5 Calculate measures of central tendency, dispersion and asymmetry, correlation and regression analysis
		CO:6 Choose a statistical method for solving practical problems
19160RLC27	Research Led Seminar	CO: 1 Understand the dynamics of marketing in business
		CO:2 ability and confidence to tackle common practical financial problems of business.
		CO:3 Understand the scope of Business, and its importance.
		CO:4 Identify different forms of business organizations viz; Sole Proprietorship, Partnership, Joint Hindu Family Business & Co-operative Organizations.
		CO:5 Understand a Joint Stock Company and various formalities to promote a Company
		CO:6 Learn various sources Industrial Financial resources and the means to raise them
19120SEC02AL	Skill Based Elective Course - II	CO:1. Identify the names and functions of the PowerPoint interface.
		CO:2. Create, edit, save, and print presentations.
		CO:3. Format presentations.
		CO:4. Add a graphic to a presentation.
		CO:5. Create and manipulate simple slide shows with outlines and notes.
		CO:6. Create slide presentations that include text, graphics, animation, and transitions.
19111SEC02L	Communicative English Lab - II	CO:1 Learn grammar.
		CO:2 Use a variety of reading strategies
		CO:3 Enhance the skill of making grammatically correct sentences.
		Co:4 Develop listening skill
	Tamil III	CO:1 Achieve one's goal by following the ancestral path

III	19110AEC31		CO:2 Learn to lead life of perfection by realizing the uncertainty in the life
			CO:3 Attain happiness through honesty
	19111AEC32	English III	CO:1 Understand phonetics.
			CO:2 Develop writing skill
			CO:3 Able to develop creative writing
	19160SEC33	Core – V Management Accounting	CO:1 Enable to appreciate different types of prose
			CO:2 Develop the conversational skills through one-act plays
			CO:3 Enhance the skill of making grammatically correct sentences.
	19160SEC34	Core – VI Marketing Management	CO:1 Understand various costing systems and management systems
			CO:2 Analyse and provide recommendations to improve the operations of organisations
			CO:3 Imbibe conceptual knowledge of cost accounting.
			CO:4 Understand the significance of cost accounting in the modern economic environment
			CO:5 Select the costs according to their impact on business
			CO:6 Apply cost accounting methods to evaluate and project business performance
	19160AEC35	Allied- V Business Law	CO:1 Understanding of Banking Channels and Payments
			CO:2 Practices on Banking Technology
			CO:3 Understanding of Core Banking
			CO:4 To gather knowledge on banking and financial system in India
			CO:5 Understand better customer relationship
			CO:6 To create awareness about modern banking services like e-banking, m-banking and internet banking
	19160AEC36	Allied- VI Human Resource Management	CO:1 Explain the concepts in business laws with respect to foreign trade
			CO:2 Apply the global business laws to current business environment
			CO:3 Demonstrate an understanding of the Legal Environment of Business.
			CO:4 Communicate effectively using standard business and legal terminology.
			CO:5 Demonstrate recognition of the requirements of the contract agreement
			CO:6 Identify contract remedies
			CO:7 Understand the various provisions of Company Law
	19160RMC37	Research Methodology	CO:1 Identify ethical, legal, cultural, and global issues affecting business communication.
			CO:2 Utilize analytical and problem solving skills appropriate to business communication.
			CO:3 Effective business writing
			CO:4 Research approaches and information collection.
			CO:5 Developing and delivering effective presentations
			CO:6 Effective interpersonal communications
			CO:7 Skills that maximise team effectiveness.
			CO:8 Good time management.

	19120SEC03AL	Skill Based Elective Course - III	CO:1 Able to carry out independent literature survey corresponding to the specific publication type and assess basic literary research tools. CO:2 familiarize participants with basic of research and the research process. CO:3 enable the participants in conducting research work and formulating research synopsis and report.
			CO:4 Develop understanding on various kinds of research, objectives of doing research, research process, research designs and sampling. CO:5 Have basic knowledge on qualitative research techniques CO:6 Have adequate knowledge on measurement & scaling techniques as well as the quantitative data analysis CO:7 Have basic awareness of data analysis and hypothesis testing procedures
	19111SEC03L	Communicative English - III	CO:1. Indicate the names and functions of the Excel interface components. CO:2. Enter and edit data. CO:3. Format data and cells. CO:4. Construct formulas, including the use of built-in functions, and relative and absolute references. CO:5. Create and modify charts. CO:6. Preview and print worksheets.
IV	19110AEC41	Tamil IV	CO:1 Realize how the ancient people changed their life style according to the ages CO:2 Learn how to change one's lifestyle according to the needs of the future CO:3 Accept the modern trends and its uses
	19111AEC42	English IV	CO:1 Develop writing skill. CO:2 Comprehend and describe poems CO:3 Learn interviewing skills
	19160SEC43	Core - VII Total Quality Management	CO:1 Improve their ability to read and understand them CO:2 Know the genius of Shakespeare CO:3 Express in writing their views.
	19160SEC44	Core - VIII Cost Accounting	CO:1 Understand the concept of partnership CO:2 Understand the journal entries for the formation of partnership CO:3 Familiarize the concept of Branch account and its system CO:4 Understand the Scope of departmental accounting CO:5 Introduce the system of Hire Purchasing CO:6 Understand partnership account from admission to dissolution
	19160AEC45	Allied -VII Retail Management	CO:1 Understand the key principles and tools of integrated marketing communication CO:2 Explain the environmental factors which influence consumer and organizational decision CO:3 Identify the elements of the communication process between buyers and sellers in business. making process CO:4 Identify the marketing mix components in relation to market segmentation CO:5 Outline a marketing plan

			CO:6 Utilize marketing research techniques to resolve into competitive marketing decisions.
	19160AEC46	Allied -VIII Industrial Relations and Labour Law	CO:1 Get a basic understanding of different type of meeting of board of directors. CO:2 Use international trade terms and concepts when communicating.
			CO:3 Demonstrate comprehensive knowledge and understanding of social and economic policy considerations arising in this area. CO:4 Understanding of those areas of company law identified in the indicative syllabus above and form a critical judgement on areas of controversy within the topics studied; CO:5 Read and study primary and secondary sources of company law, with minimal staff guidance; critically analyse, interpret, evaluate and synthesise information from a variety of sources CO:6 Identify sources for research and further develop a strategy for research using standard and electronic research tools
	19120SEC04A L	Skill Based Elective Course - IV	CO:1 Examine database concepts and explore the Microsoft Office Access environment. CO:2. Design a simple database. CO:3. Build a new database with related tables. CO:4. Manage the data in a table. CO:5. Query a database using different methods. CO:6. Design a form. CO:7. Generate a report. CO:8. Import and export data.
	19111SEC04L	Communicative English - IV	CO:1 Learn grammar. CO:2 Enable to express their views in conversation CO:3 Develop soft skills Co:4 ce presentation skills
	191ENVTSTU	Environmental Studies	CO:1 Learn about environmental pollution. CO:2 Familiarize with the social issues and the environment CO:3 will be able to do independent research on human interactions with the environment. CO:4 To recognize the physical, chemical, and biological components of the earth's systems and show how they function CO:5 Analyze and evaluate ideological and philosophical approaches used to understand environmental relationships. CO:6 Carry out an applied research project in the natural sciences.
	19160SEC51	Core - IX Financial Management	Co:1 Find out how can a company dissolve. CO:2 Understand Mutual funds investments. CO:3 Learn about Working format of companies. CO:4 Enabling the students to understand the features of Shares and Debentures CO:5 Develop an understanding about redemption of Shares and Debenture and its type CO:6 Exposure to the company final accounts

V	19160SEC52	Core - X Services Marketing	CO:1 Use business finance terms and concepts when communicating.
			CO:2 Demonstrate a basic understanding of financial management.
			CO:3 Provide introduction to Financial Management
			CO:4 Create an awareness about capital structure and theories of capital structure
			CO:5 Make them understand the cost of capital in wide aspects
			CO:6 Provide knowledge about dividend policies and various dividend models.
			CO:7 Enable them to understand working capital management
	19160SEC53	Core – XI Production and Operations Management	CO:1 Forecast a firm’s future financing requirements
			CO:2 Design an optimal capital structure.
			CO:3 Give an idea about fundamentals of financial services and players in financial sectors
			CO:4 Create an awareness about merchant banking, issue management, capital markets and role of SEBI
			CO:5 Provide knowledge about leasing and hire purchase concepts
			CO:6 Make them understand about different types of insurance and IRDA Act.
	19160SEC54	Core – XII Global Business Management	CO1: Study the development of computers and their components in each stage.
			CO2 : Develop an idea of software, programming language and operating system.
			CO3 : Study the concept of developing database and its maintenance using computers in a business Concern
			CO4 : Analyze the importance of management information system and networking in a business.
			CO5 : Be aware and perform various activities using computers in day to day life.
	19160DSC55	Discipline Specific Elective - I Participation Bounded Research	CO:1 Know about the company law in the India.
CO:2 Understand the use of the memorandum of association and article of association in a company, they also learn from this course			
CO:3 Develop Professionals in the filed of Co-operation, Co-operative law and Management.			
CO:4 Promote qualified, Skilled and professional manpower to manage the affairs of the Cooperative Institutions.			
CO:5 Enhance the Knowledge base of the in-service Personnel on the subject Co-operation, Co-operative law and Co-operative Management.			
CO:6 Enable the in-service personnel to develop skills on Co-operative Management Techniques			
19160BRC55	Participation Bounded Research	CO:1 Do the allotted work in research	
		CO:2 Learn to do review of literature	
		CO:3 Demonstrate knowledge of research processes	
		CO:4 Perform literature reviews using print and online database	
		CO:5 Identify, explain, compare, and prepare the key elements of a research proposal/report	

			CO:6 Describe sampling methods, measurement scales and instruments, and appropriate uses of each
	19120SEC05A L	Skill Based Elective Course - V	CO:1 work with the Photoshop workspace CO:2. navigate images CO:3. resize and crop images CO:4. make and work with selections CO:5. create new layers and perform other basic layer functions CO:6. transform images
	19111SEC05L	Communicative English Lab-V	CO:1 Develop corporate skills. CO:2 Handle their day to day affairs well with their knowledge of language skills.
VI	19160SEC61	Core - XIII Business Policy and Strategic Management	CO:1 Prepare analysis of various special decisions, using relevant costing and benefits
			CO:2 More effective planning and control systems
			CO:3 The students thought and knowledge on management Accounting
			CO:4 Helps to give proper idea on financial statement analysis in practical point of view
			CO:5 Introduce the concept of fund flow and cash flow statement
			CO:6 Provide knowledge about budget control keeping in mind the scope of the concept
			CO:7 Develop the know-how and concept of marginal costing with practical problems
	19160SEC62	Core – XIV Entrepreneurial Development	CO:1 Understand the systematic process to select the business ideas.
			CO:2 Write a business plan
			CO:3 Develop students about Entrepreneurship development
			CO:4 Create an awareness on various Entrepreneurship Development Programme
			CO:5 Enable them to understand project formulation
			CO:6 Familiarize the students with EDP schemes
	19160SEC63	Core – XV Logistics and Supply Chain Management	CO:1 Articulate knowledge of fundamental audit concepts
			CO:2 Apply critical thinking skills and solve auditing Problems.
			CO:3 Apply and demonstrate the accounting knowledge and skills in Auditing.
CO:4 Explain how analytical procedures are used as an audit tool.			
CO:5 Illustrate effective internal controls			
CO:6 Apply ethical standards to issues in auditing			
19160DSC64	Discipline Specific Elective – II	CO:1 File IT Return on individuals basis	
		CO:2 Compute the total Income and Define tax complications and structure.	
		CO:3 In order to familiarize the different know-how and heads of income with its components	
		CO:4 It helps to build an idea about income from house property as a concept	
		CO:5 It give more idea about the income from business or profession	

			CO:6 Make the students familiarizes with the concept of depreciation and its provisions
	191--OEC65	Open Elective	CO:1 Greater Social support CO:2 More on-task behaviour CO:3 Develop Professionals in the filed of Co-operation, Co-operative law and Management. CO:4 Promote qualified, Skilled and professional manpower to manage the affairs of the Cooperative Institutions. CO:5 Enhance the Knowledge base of the in-service Personnel on the subject Co-operation, Co-operative law and Co-operative Management. CO:6 Enable the in-service personnel to develop skills on Co-operative Management Techniques
	19160PRW66	Project Work	CO:1 To help to gather knowledge on banking and financial system in India CO:2 To provide knowledge about commercial banks and its products CO;3 Aim to familiarize banking system in India CO:4 To enable them to understand better customer relationship CO:5 To create awareness about modern banking services like e-banking, m-banking and internet banking, ATM System CO:6 To introduce recent trends in banking system CO:7 To make the student understand the basic concept of banking and financial institutions and expose various types of risk based by banks
	19120SEC06A	Case Study Analysis	CO:1 Develop plans with relevant people to achieve the project's goals CO:2 Break work down into tasks and determine handover procedures CO:3 Identify links and dependencies, and schedule to achieve deliverables CO:4 Estimate and cost the human and physical resources required, and make plans to obtain the necessary resources CO:5 Allocate roles with clear lines of responsibility and accountability. CO:6 Have adequate knowledge on measurement & scaling techniques as well as the quantitative data analysis
	19111SEC06L	Communicative English Lab - VI	CO:1. Learn to create animated graphics add sound and interactivity. CO:2. Can develop Website CO:3. CD based presentations
	191EXACT	Extension Activity	CO:1 Get a job CO:2 Apply study skills CO:3 Widen creative thinking CO:4 Be a good team worker CO:5 Make them proficient in English
		Programme Exit Examination	CO:1 Develop plans with relevant people to achieve the project's goals

	19160PEE		CO:2 Break work down into tasks and determine handover procedures
			CO:3 Identify links and dependencies, and schedule to achieve deliverables
		Skill Based Elective Courses	
	Course Code	Course Title	COS
	19120SEC01A	Fundamentals of Computers	To familiarize the students to the basic concepts of management in order to aid in understanding how an organization functions, and in understanding the complexity and wide variety of issues managers face in today's business firms.
	19160SEC01B	Soft Skills – I	To provide an overview of theories and practices in organizational behavior in individual, group and organizational level.
	19120SEC02A	Ms office Packages Lab	To acquaint the students with the fundamental principles of financial, cost & Management Accounting. Enable the students to take decisions using management accounting tools and to exposes the students to various concepts and principles of accounting for making efficient decisions.
	19160SEC02B	Soft Skills- II	To make the students aware of the various economic theories and principles - To equip them with the required tools and techniques for improving their decisionmaking skills.
	19120SEC03A	Writing and Presentation Skills Lab	To create the knowledge of Legal perspective and its practices to improvise the business.
	19160SEC03B	Soft Skills – III	This course mainly deals with the use of Statistical concepts in the resolution of managerial decision problems. As such the course will deal not only with some of the theoretical concepts in Statistics but will also be concerned with their application.
	19120SEC04A	General Aptitude and Personality Development Lab	Facilitate student to understand the operational nuances of a Finance Manager Comprehend the technique of making decisions related to finance function
	19160SEC04B	Soft Skills – IV	To provide knowledge about management issues related to staffing, training, performance, compensation, human factors consideration and compliance with human resource requirements.
	19120SEC05A	Photoshop Lab	To understand fundamental concepts of Marketing in Modern Marketing Practices

		Management Concepts	CO:1 This specialization lays the necessary groundwork for an overall successful marketing strategy
--	--	---------------------	---

	MBA 2019 PO CO		
2019		MBA	
Sem	Course Code	Title of the Course	C O S

	19160SEC05B	Soft Skills – V	To provide a broad introduction to the field production and operations management and explain the concepts, strategies, tools and techniques for managing the transformation process that can lead to competitive advantage.
--	-------------	-----------------	--

			CO:2knowledge required to understand the state of your product before approaching the market strategy
			CO:3Interpret development of marketing research
			CO:4 Identify the major influences in Consumer Behaviour
19260SEC12	Organizational Behaviour		CO:1 Contribute to the development, implementation, and evaluation of employee recruitment, selection, and retention plans and processes
			CO:2Develop, implement, and evaluate employee orientation, training, and development programs.
			CO:3Understanding of the basic concepts, functions and processes of HRM
19260SEC13	Accounting for Managers		CO:1 Focuses on services, service design, and service innovation, with the aim of developing empathy for customers and understanding the customer experience
			CO:2 strategies that support broader marketing decisions.
			CO:3 Develop an understanding of the role of relationship marketing and customer service
			CO:4 Demonstrate a knowledge of the extended marketing mix for services.
			CO:5 Exhibit the capability to work effectively within a team environment.
			CO:6Develop and Justify marketing planning and Control Systems.
19260SEC14	Economics for Managers		CO:1 Study of decision making and performance evaluation techniques in management accounting
			CO:2 Understand decision making and performance evaluation techniques in management accounting.
			CO:3 In modern competitive business environment, suitable business decision making is very crucial
			CO:4 Identify relevant information for decision making purposes in order to produce financial analyses for a range of decisions such as product-mix, pricing, outsourcing and special orders.

		CO:5 Use standard costs to prepare budgets for planning and control purposes.
		CO:6 Understand the principles of standard costing.
19260SEC15	Legal Aspects of Business	CO:1 Examine the differences and similarities between leadership, power, and management
		CO:2 Impact that a company's structure and design can have on its organizational behavior
		CO:3 Impact of culture on organizational behavior
		CO:4 Analyze management issues as related to organizational behavior
		CO:5 Examine challenges of effective organizational communication
		CO:6 Evaluate ethical issues as related to organizational behavior
19260SEC16	Statistics for Managers	CO:1 Develop skills in data collection and complex analysis
		CO:2 Clarify terminology and approaches to different facets of research-based teaching
		CO:3 Explore good practices in institution-driven, strategic approaches on how to integrate research and education missions
		CO:4 Generate ideas on how to build the capacity of faculty members to implement research-based teaching
		CO:5 Create a research-based learning environment
		CO:6 Analyze national frameworks, policies and funding
19220SEC01	Managerial Skill Development - Lab	CO:1 Employ basic statistical methods to decision making
		CO:2 Understand how to apply basic models and theories in business
		CO:3 Solve management problems effectively
		CO:4 Use software tools to model decision problems.
		CO:5 Clearly identify an otherwise unstructured business problem and its components
		CO:6 Employ effective techniques for addressing the major challenges presented
		CO:7 Provide a solution to the decision process

	19260CRS17	Research Led Seminar	CO:1 Given a product or a service type, the student manager will be able to enumerate and justify the dimensions of product quality or service quality for the same
			CO:2 Given the quality gurus (Deming/ Juran/ Taguchi/ Crosby), the student manager will be able to justify their philosophies/ contributions in Quality Management.

			CO:3 Given a quality problem/ failure mode, the student manager will be able to identify causes and sub causes of the effect/ problem draw and justify Ishikawa Diagram.
			CO:4 For a given type of organization, the student manager will be able to enlist and justify the four levelsof benchmarking and/ or enlist and brief seven step benchmarking model
II	19260SEC21	Financial Management	CO:1 Activity based approaches to management and costanalysis
			CO:2 Analysis of common costs in manufacturing andservice industry
			CO:3 Techniques for profit improvement, cost reduction,and value analysis
			CO:4 Throughput accounting
			CO:5 Target costing; cost ascertainment and pricing ofproducts and services
			CO:6 Pricing Decisions
			CO:7 Budgets and Budgetary Control
			CO:8 Evolution of standards, continuous - improvement;keeping standards meaningful and relevant; variance analysis
			CO:6 Distinguish Joint Venture and Partnership and to learn the methods of maintaining records under JointVenture
			CO:7 Understand the meaning and features of Non-Profit Organisations
			CO:8 Learn to prepare Receipts & Payment Account, Income & Expenditure Account and Balance Sheet forNon-Profit Organizations
			19260SEC22
	CO:2 Understanding of the concept of socialresponsibility and the role it plays in retailin		
	CO:3 Aware of the moral and ethical dilemmas that facethe retailing industry in today’s business environment		
	CO:4 Development and understanding of implementinga retail strategy.		
	CO: 5 Understanding of the increased use of technologyin the field of retailing		
	CO:6 Identify key roles within retail businesses		

	19260SEC23	Marketing Management	CO:1 Demonstrate knowledge of research processes(reading, evaluating, and developing)
--	------------	----------------------	---

		CO:2 Perform literature reviews using print and onlinedatabases
		CO:3 Identify, explain, compare, and prepare the keyelements of a research proposal/report
		CO:4 Select and define appropriate research problemand parameters
		CO:5 Prepare a project proposal (to undertake a project)
		CO:6 Understand some basic concepts of research andits methodologies
19260SEC24	Production & Operations Management	CO:1 Develop understanding on various kinds of research, objectives of doing research, research process,research designs and sampling.
		CO:2 Have basic knowledge on qualitative researchtechniques
		CO:3Have adequate knowledge on measurement &scaling techniques as well as the quantitative data analysis
		CO:4 Have basic awareness of data analysis-andhypothesis testing procedures
		CO:5 knowledge for enabling students to develop data analytics skills and meaningful interpretation to the datasets so as to solve the business/Research problem.
		CO:6 Describe sampling methods, measurement scalesand instruments, and appropriate uses of each
19260RMC25	Research Methodology	CO:1 Understand the How Subcontract Administrationand Control are practiced in the Industry.
		CO:2 Understand the contract management, Project Procurement, Service level Agreements and productivity
		CO:3 Apply the risk management plan and analyse therole of stakeholders.
		CO:4 Analyze the learning and understand techniques for Project planning, scheduling and Execution Control.
		CO:5 Understand the conceptual clarity about projectorganization
		CO:6 Understand project characteristics and variousstages of a project
	Strategic Management	CO:1 Critically analyse both older and newer MAMethods and their effects in organisations

	19260SEC26		CO:2 knowledge and understanding about MA issues,including its problems and difficulties	CO:3 Part in the design and use of the managementaccounting system in organisations
--	------------	--	--	---

			CO:4 Updated concerning the more recent development in MA and the emergence of new methods
			CO:5 More advanced level compared to the basic knowledge acquired on the Bachelor level
			CO:6 Exposure to the company final accounts
	19220SEC02	Data Analysis Lab	CO:1 Knowledge, understanding and skills in the area of international financial relations and tools for its implementation
			CO:2 Knowledge and understanding of characteristics, activities, principles and specifics of international financial relations
			CO:3 Ability to summarize and critically evaluate results obtained by researchers in the field of international financial relations
			CO:4 Ability to analyse and use various sources of information and data in the field and make assessment
			CO:5 Use methods in the field of international finance in practice;
			CO:6 Economic essence and currency classifications: the concept of currency and its basic classification; characteristics of currencies.
	19260BRC27	Participation in Bounded Research	CO:1 To introduce meaning and functions of Financial Intermediaries
			CO:2 To understand the role of merchant bank and its services
			CO:3 To provide information regarding management of mutual funds and Regulations
			CO:4 To understand the role and functions of financial services Marketing
			CO:5 To know the structure and types of debt Instruments
			CO:6 To realize Foreign Exchange Market
III	19260SEC31	International Business Environment	CO:1 to help students manage individual or team projects.
			CO:2 Begin project-planning with a specific audience with a specific and pressing concern
			CO:3 Let students design their own projects. Or require that projects iterate or counter existing cultural trends and patterns or that address compelling social concerns (e.g. technology addiction).
			CO:4 Use concept-mapping before, during, and after the project is completed.

			CO:5 Give students the opportunities to use their specific gifts, skills, and backgrounds in completing the project.
--	--	--	--

		CO:6 Help students brainstorm the opportunities for creative risk-taking at the beginning of a project.
19260SEC32	Operations Research	CO:1 File IT Return on individuals basis
		CO:2 Compute the total Income and Define tax complications and structure.
		CO:3 In order to familiarize the different know-how and heads of income with its components
		CO:4 It helps to build an idea about income from house property as a concept
		CO:5 It give more idea about the income from business or profession
		CO:6 Make the students familiarizes with the concept of depreciation and its provisions
19260SRC33	Design/Socio-Technical Project	CO:1 Have developed an understanding of major issues related to international Business
		CO:2 Have developed skills in researching and analyzing trends in global markets and in modern marketing practice
		CO:3 An organization's ability to enter and compete in international markets.
		CO:4 Develop skills in researching and analyzing international Business opportunities
		CO:5 Develop a high level of analytical skills and critical thinking in an international Business context
		CO:6 Explain the main institutions that shape the global marketplace;
19260SEC41	Entrepreneurial Development	CO:1 Know about the company in the Abroad.
		CO:2 Understand the use of the memorandum of association and article of association in a company, they also learn from this course
		CO:3 Develop Professionals in the filed of Project
19260PRW44	Project Work	CO:1 Have developed an understanding of major issues related to international Business
		CO:2 Have developed skills in researching and analyzing trends in global markets and in modern marketing practice
		CO:3 An organization's ability to enter and compete in international markets.
		CO:4 Develop skills in researching and analyzing international Business

		opportunities
		CO:5 Develop a high level of analytical skills and critical thinking in an international Business contex

	19260PEE	Programme Exit Exam	CO:1 Have developed an understanding of major issues related to international Business
			CO:2 Have developed skills in researching and analyzing trends in global markets and in modern marketing practice
			CO:3 An organization's ability to enter and compete in international markets.
			CO:4 Develop skills in researching and analyzing international Business opportunities
	SPECIALIZATIONS		
	MARKETING		
2019		MBA	
Sem	Course Code	Title of the Course	C O S
III	19260EA33	Consumer Behaviour	The basic objective of this course is to develop an understanding about the consumer decision making process and its applications in marketing function of firms.
	19260EA34	Integrated Marketing Communication	Due to ever increasing business dealings the subject of International Marketing has gained utmost importance in recent times. The world these days, indeed has shrunk and foreign markets have particularly become important especially for a developing country like India. The major objective of this course is to provide an exposure to the area of Marketing in the International perspective.
	19260EA35	Brand Management	The objective of this course is to introduce students to the basic scope, benefits and types of brands; and understand the steps involved in designing an appropriate brand for the organization.
	19260EA36	Retail Management	The objective of this course is to introduce students to the basic scope, benefits and types of retailers; and understand the steps involved in designing an appropriate retail organization structure.

	19260EA37	Sales Management	The purpose of this paper is to acquaint the student with the concepts which are helpful in developing a sound sales policy and in organizing and managing sales force and marketing channels and to impart the knowledge about sales management procedure, and activities.
--	-----------	------------------	---

	19260EA38	Services Marketing	The objective of the course is to develop an understanding of services and service marketing with emphasis on various aspects of service marketing which make it different from goods marketing.
	19260EA39	Industrial Marketing	A broad range of job profiles are available for individuals with a degree in industrial marketing courses, and many top companies provide various job offers for students engaged in this course degree. A Market Analyst helps companies and organizations in decision making of products and services.
IV	19260EA42	Customer Relationship Management	The paper is designed to impart the skill based knowledge of Customer Relationship Management. The purpose of the syllabus is to not just make the students aware of the concepts and practices of CRM in modern businesses but also enable them to design suitable practices and programs for the company they would be working.
	19260EA43	International Marketing	The course has been developed so as to acquaint the students with environmental, procedural, institutional and decisional aspects of International Marketing.
	19260EA44	Rural Marketing	The objective of this course is to explore the students to Rural Marketing environment so that they can understand consumer's and marketing characteristics of the same for understanding and contributing to the emerging challenges in the upcoming global economic scenario.
	Human Resource		
2017		MBA	
Sem	Course Code	Title of the Course	C O S
III	19260EB33	Knowledge Management	The goal of the course is to prepare students to become familiar with the current theories, practices, tools and techniques in knowledge management (KM), and to assist students in pursuing a career in the information sector for profit and not for profit organizations. In addition, students will learn to determine the infrastructure requirements to manage the intellectual capital in organizations.

19260EB34	Organizational Development & Change management	The objective of this paper is to prepare students as organizational change facilitators using the knowledge and techniques of behavioral science.
-----------	--	--

	19260EB35	Performance Management	The objective of this course is to help the students gain understanding of the functions of performance management system in the organization and provide them tools and techniques to be used in appraising the performance of the employees.
	19260EB36	Labour Legislations	This course will help the student to get exposure on Industrial Law. Understand the relationship between the employee, employer, union and government and to have awareness of various industrial laws relating to employees.
	19260EB37	Compensation Reward Management	The course is designed to promote understanding of issues related to the compensation and rewarding human resources in the organizations and to impart skills in designing analyzing and restructuring reward management systems, policies and strategies.
	19260EB38	Cross Culture Management	The objective of this course is to develop a diagnostic and conceptual understanding of the cultural and related behavioral variables in the management of global organizations.
	19260EB39	Conflict and Negotiation Management	The course plan to develop an understanding of conflict dynamics and the art and science of negotiation. On the completion of syllabus, students will be in a position to answer the role that can be played by conflict resolution techniques such as mediation.
IV	19260EB42	Industrial Relation	This course will help the student to get exposure on Industrial Relations. Understand the relationship between the employee, employer, union and government
	19260EB43	Training & Development	The objective of this course is to help the students gain understanding of the objectives of training in the organization and provide them tools and techniques to be used in training the employees. This paper will attempt to orient the students to tailor themselves to meet the specific needs of the organizations in training and development activities.
	19260EB44	Talent Management	This course will help the student to get exposure on Talent management. Understand the how to acquire talent employees and how to retain such employees in the organization for effective performance and achievement of goals.
	FINANCE		
2017		MBA	

Sem	Course Code	Title of the Course	C O s
------------	--------------------	----------------------------	----------------------

III	19260EC33	Security Analysis and Portfolio Management	The objective of this course is to impart knowledge +D477:D486to students regarding the theory and practice of Security Analysis and to give the students anin-depth knowledge of the theory and practice of Portfolio Management.
	19260EC34	Derivatives Management	To give an in-depth knowledge of the functioning ofderivative securities market.
	19260EC35	Project Finance	
	19260EC36	Financial Services and Institutions	The objective of the course is to provide to the students aspecialized knowledge of the techniques of evaluating proposed investments and to acquaint them with the problems encountered in the decisional process pertaining to capital investments of the project.
	19260EC37	International Finance	This course provides an understanding of the following fund-based and fee-based financial services offered by financial intermediaries such as non-banking finance companies, banks and financial institutions. This coursewill also focus on issues concerning the financial management of financial intermediaries.
	19260EC38	Insurance and Risk Management	To give the students an overall view of the internationalfinancial system – instruments and markets.
	19260EC39	Corporate Finance	To provide the basics of insurance contracts and toexplain the various types of insurance policies.
IV	19260EC42	Micro Finance	Student will acquire Nuances involved in short termcorporate financing, Good ethical practices
	19260EC43	Strategic Financial Management	To enable the students to understand the principles,practices and application in Micro Finance.
	19260EC44	Merchant Banking and Financial Services	To equip the students with necessary strategic knowledge and skills received to evaluate discussions orcapital restructuring, mergers and acquisitions.
	Production and Operations		
2017		MBA	
Sem	Course Code	Title of the Course	C O S

III	19260ED33	Project Management	This course focuses on project management methodology that will increase the ability of students to initiate and manage projects more efficiently and effectively. Also they will learn key project management phases through an innovative model.
	19260ED34	Planning and control of operations	This course is designed to acquaint the student with the methods of planning and control

	19260ED35	Technology Management	This course helps to understand the dynamics of technological innovation and be familiar with how to formulate technology strategies
	19260ED36	Logistics Management	The objective of this course is to get the exposure of logistics management and to understand the relationship between the logistics and packaging.
	19260ED37	Supply Chain Management	The objective of this course is to get the exposure of supply chain management and to understand the relationship between the procurement and supply chain management
	19260ED38	Business Process Reengineering	The objectives of this course are to acquaint the student with understanding process orientation in business management and develop skills and abilities in re-engineering and business process for optimum performance.
	19260ED39	Material Management	To understand the working of a materials management department, Aspects of Stores management, Warehousing management and material requirement planning.
IV	19260ED42		
	19260ED42	Maintenance Management	To enable the students to understand the principles, practices and applications in Maintenance Management.
	19260ED43	Service and Operation Management	To help understand how service performance can be improved by studying services operations management
	19260ED44	Product Design	To help Understand the application of structured methods to develop a product. Student gains knowledge on how a product is designed based on the needs of a customer
	LOGISTICS AND SUPPLY CHAIN MANAGEMENT		
2017		MBA	
Sem	Course Code	Title of the Course	C O S
III	19260EE33	Purchasing and Procurement Management	The objective of this course is to impart knowledge to students regarding the theory and practice of Security Analysis and to give the students an in-depth knowledge of the theory and practice of Portfolio Management.
	19260EE34	Material Management	To give an in-depth knowledge of the functioning of derivative securities market.
	19260EE35	Inventory Management	

19260EE36	Supply Chain Management	The objective of the course is to provide to the students aspecialized knowledge of the techniques of evaluating proposed investments and to acquaint them with the problems encountered in the decisional process pertaining to capital investments of the project.
-----------	-------------------------	--

	19260EE37	Logistics Management	This course provides an understanding of the following fund-based and fee-based financial services offered by financial intermediaries such as non-banking finance companies, banks and financial institutions. This course will also focus on issues concerning the financial management of financial intermediaries.
	19260EE38	Custom House Practice And Legalities	
	19260EE39	Export Trade And Documentation	To provide the basics of insurance contracts and to explain the various types of insurance policies.
IV	19260EE42	Quality Management	Student will acquire Nuances involved in short term corporate financing, Good ethical practices
	19260EE43	Air Cargo Logistics Management	To enable the students to understand the principles, practices and application in Micro Finance.
	19260EE44	Shipping And Ocean Freight Logistics Management	To equip the students with necessary strategic knowledge and skills received to evaluate discussions or capital restructuring, mergers and acquisitions.
INTERNATIONAL BUSINESS			
2017		MBA	
Sem	Course Code	Title of the Course	C O S
III	19260EF33	International Marketing	The objective of this course is to impart knowledge to students regarding the theory and practice of Security Analysis and to give the students an in-depth knowledge of the theory and practice of Portfolio Management.
	19260EF34	International Human Resource Management	To give an in-depth knowledge of the functioning of derivative securities market.
	19260EF35	Cross Cultural Management	
	19260EF36	Global Logistics and Supply Chain Management	The objective of the course is to provide to the students a specialized knowledge of the techniques of evaluating proposed investments and to acquaint them with the problems encountered in the decisional process pertaining to capital investments of the project.

19260EF37	International Trade Procedures	<p>This course provides an understanding of the following fund-based and fee-based financial services offered by financial intermediaries such as non-banking finance companies, banks and financial institutions. This course will also focus on issues concerning the financial management of financial intermediaries.</p>
		<p>To give the students an overall view of the international financial system – instruments and markets.</p>

	19260EF38	International Strategic Management	To provide the basics of insurance contracts and to explain the various types of insurance policies.
	19260EF39	Global Business Ethics and Corporate Governance	To give the students an overall view of the international financial system – instruments and markets.
IV	19260EF42	Management Of International Developmental Organizations	To enable the students to understand the principles, practices and application in Micro Finance.
			To equip the students with necessary strategic knowledge and skills received to evaluate discussions or capital restructuring, mergers and acquisitions.
	19260EF43	Merger and Acquisitions	The course is to sensitize the students to issues pertaining to sustainable development and business ethics and enable development and business ethics and enable them to understand the implications of various statutory and policy guidelines concerning corporate governance for actual business decision making.
	19260EF44	International Financial Management	The course is to sensitize the students to issues pertaining to sustainable development and business ethics and enable development and business ethics and enable them to understand the implications of various statutory and policy guidelines concerning corporate governance for actual business decision making.
	SYSTEM		
2017		MBA	
Sem	Course Code	Title of the Course	C O S
III	19260EG33	Software Engineering	This course aims to understand the software engineering and apply the knowledge of a disciplined approach to the development of software and to the management of the software product lifecycle.
	19260EG34	Software Project Management	To give an in-depth knowledge of the functioning of derivative securities market.
	19260EG35	Relational Database Management	

19260EG36	E- Business Technology Management	The objective of the course is to provide to the students aspecialized knowledge of the techniques of evaluating proposed investments and to acquaint them with the problems encountered in the decisional process pertaining to capital investments of the project.
-----------	-----------------------------------	--

	19260EG37	Data Warehousing & Data Mining	This course provides an understanding of the following fund-based and fee-based financial services offered by financial intermediaries such as non-banking finance companies, banks and financial institutions. This course will also focus on issues concerning the financial management of financial intermediaries.
	19260EG38	Knowledge Management	To give the students an overall view of the international financial system – instruments and markets.
	19260EG39	Enterprise Resource Planning	To provide the basics of insurance contracts and to explain the various types of insurance policies.
IV	19260EG42	Information Storage & Management	Student will acquire Nuances involved in short term corporate financing, Good ethical practices
	19260EG43	Cloud Computing	To enable the students to understand the principles, practices and application in Micro Finance.
	19260EG44	Decision Support System And Intelligent Systems	To understand the components of DSS and IS. To know the appropriate model to be used for a problem
	HOSPITAL MANAGEMENT		
2017		MBA	
Sem	Course Code	Title of the Course	C O S
III	19260EH33	Management Of Hospital Services	To enable the students gain insights into various aspects like importance, functions, policies and procedures, equipping, controlling, co-ordination, communication, staffing, reporting and documentation of both clinical and non clinical services in a hospital.
	19260EH34	Operations Management In Health Care	To give an in-depth knowledge of the functioning of derivative securities market.
	19260EH35	Marketing Management Of Hospital And Health Care Services	
	19260EH36	Community Health and Management of	The objective of the course is to provide to the students a specialized knowledge of the techniques of evaluating proposed investments and to acquaint them with the problems encountered in the decisional process pertaining to capital investments of the project.

19260EH37	National Health Programmes	This course provides an understanding of the following fund-based and fee-based financial services offered by financial intermediaries such as non-banking finance companies, banks and financial institutions. This course will also focus on issues concerning the financial management of financial intermediaries.
-----------	----------------------------	--

	19260EH38	Management of Clinical and Super Specialty	To give the students an overall view of the international financial system – instruments and markets.
	19260EH39	Services in Hospitals	To provide the basics of insurance contracts and to explain the various types of insurance policies.
IV	19260EH42	Patient Care Management	Student will acquire Nuances involved in short term corporate financing, Good ethical practices
	19260EH43	Health Related Laws and Ethics	To enable the students to understand the principles, practices and application in Micro Finance.
	19260EH44	Medical Tourism	The Objective of the Course is to familiarize the learner with the importance, techniques and the procedures involved in the management of Hospital Waste.
TOURISM			
2017		MBA	
Sem	Course Code	Title of the Course	C O S
III	19260EI33	Tourism Principles, Policies and Practices	To realize the potential of tourism industry in India. To understand the various elements of Tourism Management and familiarize with the Tourism policies in the national and international context.
	19260EI34	Tourism Products of India	To give an in-depth knowledge of the functioning of derivative securities market.
	19260EI35	Destination Planning and development	
	19260EI36	Travel agency and Tour operations	The objective of the course is to provide to the students a specialized knowledge of the techniques of evaluating proposed investments and to acquaint them with the problems encountered in the decisional process pertaining to capital investments of the project.
	19260EI37	Hospitality Management	This course provides an understanding of the following fund-based and fee-based financial services offered by financial intermediaries such as non-banking finance companies, banks and financial institutions. This course will also focus on issues concerning the financial management of financial intermediaries.
	19260EI38	Indian culture and Heritage	To give the students an overall view of the international financial system – instruments and markets.

	19260EI39	Tourism Marketing	To provide the basics of insurance contracts and to explain the various types of insurance policies.
IV	19260EI42	Ecotourism	Student will acquire Nuances involved in short term corporate financing, Good ethical practices
	19260EI43	Event Management	To enable the students to understand the principles, practices and application in Micro Finance.

	19260EI44	E- Tourism	To equip the students with necessary strategic knowledge and skills received to evaluate discussions or capital restructuring, mergers and acquisitions.
AGRI BUSINESS MANAGEMENT			
2017		MBA	
Sem	Course Code	Title of the Course	C O S
III	19260EJ33	Agribusiness Environment and Policy	To realize the potential of tourism industry in India. To understand the various elements of Tourism Management and familiarize with the Tourism policies in the national and international context.
	19260EJ34	Agricultural Marketing Management	To give an in-depth knowledge of the functioning of derivative securities market.
	19260EJ35	Farm Business Management	
	19260EJ36	Management of Agribusiness Cooperatives	The objective of the course is to provide to the students a specialized knowledge of the techniques of evaluating proposed investments and to acquaint them with the problems encountered in the decisional process pertaining to capital investments of the project.
	19260EJ37	Food Retail Management	This course provides an understanding of the following fund-based and fee-based financial services offered by financial intermediaries such as non-banking finance companies, banks and financial institutions. This course will also focus on issues concerning the financial management of financial intermediaries.
	19260EJ38	Management of Agricultural Input Marketing	To give the students an overall view of the international financial system – instruments and markets.
	19260EJ39	Agri Supply Chain Management	To provide the basics of insurance contracts and to explain the various types of insurance policies.
	19260EJ42	Agriculture Economics	Student will acquire Nuances involved in short term corporate financing, Good ethical practices
	19260EJ43	Agricultural and Micro-Finance	To enable the students to understand the principles, practices and application in Micro Finance.

IV	19260EJ44	New Trends and Development in Agri-Sector	To equip the students with necessary strategic knowledge and skills received to evaluate discussions or capital restructuring, mergers and acquisitions.
----	-----------	---	--

PROGRAM OUTCOMES

- Acquiring Conceptual Clarity of Various Functional Areas
- Ability to analyze various functional issues affecting the organization
- Demonstrating ability to evolve strategies for organizational benefits
- Analysis and interpretation of the data which is used in Decision Making
- Demonstrate Ability to work in Groups
- Demonstrate understanding of social cues and contexts in social interaction
- Develop Ethical Practices and Imbibe Values for Better Corporate Governance.
- Understand ethical challenges and choices in a business setting
- Demonstrate understanding of sustainability related concerns in varied areas
- Analyze Global Environment and its Impact on Business
- Understand the ecosystem of start up in the country
- Demonstrate the ability to create business plans

PROGRAM SPECIFIC OUTCOMES

- An Understanding of Business Functions
- Providing Global Perspectives
- Developing Critical and Analytical Thinking Abilities
- Interpersonal Skill Development
- Creating Social Sensitivity and Understanding CSR, Ethical and Sustainable Business Practices
- Demonstrate sensitivity to social, ethical and sustainability issues
- Developing Entrepreneurship Acumen
- Demonstrate the ability to develop models / frameworks to reflect critically on specific business contexts
- Demonstrate Effectively Oral and Written Communication

Sem	Course Code	Title of the Course	COs
I	20110AEC11	Tamil I	CO:1 Learn the changes occurred in literature since classical period.
			CO:2 Make use of vocabulary systematically.
			CO:3 Understand how to lead one's life realizing the modernity and its environment/atmosphere.
	20111AEC12	English I	CO:1 Develop vocabulary
			CO:2 Learn to edit and do proof reading
			CO:3 Read and comprehend literature
	20160SEC13	Principles of Management	CO:1 Understanding the fundamental of financial accounting
			CO:2 Develop the modern market economy
			CO:3 prepare the different kinds of financial statement
	20160SEC14	Managerial Economics	CO:1 Discuss the supply and demand theory and its impact on insurance
			CO:2 outline an how entity operate in the Business environment
			CO:3 Explain the legal frame work that regulate the insurance industry
20160AEC15	Business Communication	CO:1 Understand fundamental marketing concepts, theories and principles in areas of marketing policy	

			CO:2 Apply the knowledge, concepts, tools necessary to understand challenges
			CO:3 Understand the marketing concepts and its evolution
	20160AEC16	Business Mathematics and Statistics	CO:1 Apply the concept of opportunity cost.
			CO:2 understand the concepts of cost, nature of production and its relationship to Business operations.
			CO:3 Apply Economic theories to business decision
	201LSCIC	Indian Constitution	CO:1 Know the consumer behavior and their decision making process
			CO:2 Understand the rural markets and the contemporary issues in marketing
			Co:3 Make decisions on product, price , promotion mix and distribution
	201LSCUV	Universal Human Values	CO:1 Discuss the supply and demand theory and its impact on insurance
			CO:2 outline an how entity operate in the Business environment
			CO:3 Explain the legal frame work that regulate the insurance industry
II	20110AEC21	Tamil II	CO:1 Know what devotion really is.
			CO:2 Know the fruitfulness obtained through devotion.
			CO:3 Perceive the progress achieved in the society through devotion.
	20111AEC22	English II	CO:1 Develop technological skill.
			CO:2 Able to write in a variety of formats
			CO:3 Read biographies and develop personality
	20160SEC23	Financial Accounting	CO:1 Appreciate different forms of literature
			Co:2 Acquire language skills through literature
			Co:3 Broadens the horizon of knowledge
	20160SEC24	Organizational Behaviour	CO:1 familiarize the concept of Branch account and its system
			CO:2 understand the Scope of departmental accounting
			CO:3 Appreciate the need for negotiable instruments and procedure of accounting for bills honoured and dishonoured
	20160AEC25	Business Environment	CO:1 Understand, and evaluate various organizational influences affecting ethical decisions
			CO:2 Present and analyze ethical and moral issues
		CO:3 Explore ethical theories	
20160AEC26	Management Information System	CO:1 Critically evaluate the underlying assumptions of analysis tools	
		CO:2 Solve a range of problems using the techniques covered	
		CO:3 Conduct basic statistical analysis of data.	
20160RLC27	Research Led Seminar	CO: 1 Understand the dynamics of marketing in business	
		CO:2 ability and confidence to tackle common practical financial problems of business.	
		CO:3 Understand the scope of Business, and its importance.	
201SSCBE	Basic Behavioral Etiquette	CO:1. Identify the names and functions of the PowerPoint interface.	
		CO:2. Create, edit, save, and print presentations.	
		CO:3. Format presentations.	
201LSCCS	Communication Skills	1. Recognize when to use each of the Microsoft Office programs to create professional and academic documents.	
		2. Use Microsoft Office programs to create personal, academic and business documents following current professional and/or industry standards.	
		3. Apply skills and concepts for basic use of computer hardware, software, networks, and the Internet in the workplace and in future coursework as identified by the internationally accepted Internet and Computing Core (IC3) standards.	
III	20110AEC31	Tamil III	CO:1 Achieve one's goal by following the ancestral path
			CO:2 Learn to lead life of perfection by realizing the uncertainty in the life

			CO:3 Attain happiness through honesty
	20111AEC32	English III	CO:1 Understand phonetics. CO:2 Develop writing skill CO:3 Able to develop creative writing
	20160SEC33	Management Accounting	CO:1 Enable to appreciate different types of prose CO:2 Develop the conversational skills through one-act plays CO:3 Enhance the skill of making grammatically correct sentences.
	20160SEC34	Marketing Management	CO:1 Understand various costing systems and management systems CO:2 Analyse and provide recommendations to improve the operations of organisations CO:3 Imbibe conceptual knowledge of cost accounting.
	20160AEC35	Business Law	CO:1 Understanding of Banking Channels and Payments CO:2 Practices on Banking Technology CO:3 Understanding of Core Banking
	20160AEC36	Human Resource Management	CO:1 Explain the concepts in business laws with respect to foreign trade CO:2 Apply the global business laws to current business environment CO:3 Demonstrate an understanding of the Legal Environment of Business.
	20160RMC37	Research Methodology	CO:1 Identify ethical, legal, cultural, and global issues affecting business communication. CO:2 Utilize analytical and problem solving skills appropriate to business communication. Co:3 Effective business writing
	201LSCOA	Office automation	CO:1 Able to carry out independent literature survey corresponding to the specific publication type and assess basic literary research tools. CO:2 familiarize participants with basic of research and the research process. CO:3 enable the participants in conducting research work and formulating research synopsis and report.
IV	20110AEC41	Tamil IV	CO:1 Realize how the ancient people changed their life style according to the ages CO:2 Learn how to change one's lifestyle according to the needs of the future CO:3 Accept the modern trends and its uses
	20111AEC42	English IV	CO:1 Develop writing skill. CO:2 Comprehend and describe poems CO:3 Learn interviewing skills
	20160SEC43	Total Quality Management	CO:1 Improve their ability to read and understand them CO:2 Know the genius of Shakespeare CO:3 Express in writing their views.
	20160SEC44	Cost Accounting	CO:1 Understand the concept of partnership CO:2 Understand the journal entries for the formation of partnership CO:3 Familiarize the concept of Branch account and its system
	20160AEC45	Retail Management	CO:1 Understand the key principles and tools of integrated marketing communication CO:2 Explain the environmental factors which influence consumer and organizational decision CO:3 Identify the elements of the communication process between buyers and sellers in business. making process
	20160AEC46	Industrial Relations and Labour Law	CO:1 Get a basic understanding of different type of meeting of board of directors. CO:2 Use international trade terms and concepts when communicating.

			CO:3 Demonstrate comprehensive knowledge and understanding of social and economic policy considerations arising in this area.	
	201SSCAQ	General Aptitude and Personality Development Lab	CO:1 Examine database concepts and explore the Microsoft Office Access environment. CO:2. Design a simple database. CO:3. Build a new database with related tables.	
	201LSCLS	Leadership and Management Skills	CO:1 Understand the concept of partnership CO:2 Understand the journal entries for the formation of partnership CO:3 Familiarize the concept of Branch account and its system	
	201ENSTU45	Environmental Studies	CO:1 Learn about environmental pollution. CO:2 Familiarize with the social issues and the environment CO:3 will be able to do independent research on human interactions with the environment.	
V	20160SEC51	Financial Management	Co:1 Find out how can a company dissolve. CO:2 Understand Mutual funds investments. CO:3 Learn about Working format of companies.	
	20160SEC52	Services Marketing	CO:1 Use business finance terms and concepts when communicating. CO:2 Demonstrate a basic understanding of financial management. CO:3 Provide introduction to Financial Management	
	20160SEC53	Production and Operations Management	CO:1 Forecast a firm's future financing requirements CO:2 Design an optimal capital structure. CO:3 Give an idea about fundamentals of financial services and players in financial sectors	
	20160SEC54	Global Business Management	Co1:Study the development of computers and their components in each stage. CO2 : Develop an idea of software, programming language and operating system. CO3 : Study the concept of developing database and its maintenance using computers in a business Concern	
	20160DSC55A	Advertising and salesmanship	CO:1 Know about the company law in the India. CO:2 Understand the use of the memorandum of association and article of association in a company, they also learn from this course CO:3 Develop Professionals in the filed of Co-operation, Co-operative law and Management.	
	20160DSC55B	Investment Management	CO:1 Do the allotted work in research CO:2 Learn to do review of literature CO:3 Demonstrate knowledge of research processes	
	20160BRC56	Participation Bounded Research	CO:1 Perform literature reviews using print and online database CO:2 Identify, explain, compare, and prepare the key elements of a research proposal/report CO:3Describe sampling methods, measurement scales and instruments, and appropriate uses of each	
	201ACLSPL	Professional Skills	CO:1 work with the Photoshop workspace CO:2. navigate images CO:3. resize and crop images	
	VI	20160SEC61	Business Policy and Strategic Management	CO:1 Prepare analysis of various special decisions, using relevant costing and benefits CO:2 More effective planning and control systems CO:3 The students thought and knowledge on management Accounting

20160SEC62	Entrepreneurial Development	CO:1 Understand the systematic process to select the business ideas.	
		CO:2 Write a business plan	
		CO:3 Develop students about Entrepreneurship development	
	20160SEC63	Logistics and Supply Chain Management	CO:1 Articulate knowledge of fundamental audit concepts
			CO:2 Apply critical thinking skills and solve auditing Problems.
			CO:3 Apply and demonstrate the accounting knowledge and skills in Auditing.
	20160DSC64A	Customer Relationship Management	Co:1 Find out how can a company dissolve.
			CO:2 Understand Mutual funds investments.
			CO:3 Learn about Working format of companies.
20160DSC64B	Financial Services	CO:1 Develop plans with relevant people to achieve the project's goals	
		CO:2 Break work down into tasks and determine handover procedures	
		CO:3 Identify links and dependencies, and schedule to achieve deliverables	
20160PRW66	Project Work	CO:1 To help to gather knowledge on banking and financial system in India	
		CO:2 To provide knowledge about commercial banks and its products	
		CO:3 Aim to familiarize banking system in India	
201SSCIM	Interview Skills Training and Mock Test	CO:1. Learn to create animated graphics add sound and interactivity.	
		CO:2. Can develop Website	
		CO:3. CD based presentations	
201SSCIM	Community Engagement	CO:1 Develop writing skill.	
		CO:2 Comprehend and describe poems	
		CO:3 Learn interviewing skills	
201TERP9	Tally ERP 9	Co:1 Find out how can a company dissolve.	
		CO:2 Understand Mutual funds investments.	
		CO:3 Learn about Working format of companies.	
20160PEE	Programme Exit Examination	CO:1 Develop plans with relevant people to achieve the project's goals	
		CO:2 Break work down into tasks and determine handover procedures	

Skill Based Elective Courses

Course Code	Course Title	COS
20120SEC01A	Fundamentals of Computers	To familiarize the students to the basic concepts of management in order to aid in understanding how an organization functions, and in understanding the complexity and wide variety of issues managers face in today's business firms.
20160SEC01B	Soft Skills – I	To provide an overview of theories and practices in organizational behavior in individual, group and organizational level.
20120SEC02A	Ms office Packages Lab	To acquaint the students with the fundamental principles of financial, cost & Management Accounting. Enable the students to take decisions using management accounting tools and to exposes the students to various concepts and principles of accounting for making efficient decisions
20160SEC02B	Soft Skills- II	To make the students aware of the various economic theories and principles - To equip them with the required tools and techniques for improving their decisionmaking skills.

20120SEC03A	Writing and Presentation Skills Lab	To create the knowledge of Legal perspective and its practices to improve the business.
20160SEC03B	Soft Skills – III	This course mainly deals with the use of Statistical concepts in the resolution of managerial decision problems. As such the course will deal not only with some of the theoretical concepts in Statistics but will also be concerned with their application.
20120SEC04A	General Aptitude and Personality Development Lab	Facilitate student to understand the operational nuances of a Finance Manager. Comprehend the technique of making decisions related to finance function.
20160SEC04B	Soft Skills – IV	To provide knowledge about management issues related to staffing, training, performance, compensation, human factors consideration and compliance with human resource requirements.
20120SEC05A	Photoshop Lab	To understand fundamental concepts of Marketing in Modern Marketing Practices.
20160SEC05B	Soft Skills – V	To provide a broad introduction to the field of production and operations management and explain the concepts, strategies, tools and techniques for managing the transformation process that can lead to competitive advantage.



2019 BBA Mapping of COs and POs

2019 BBA Mapping of COs and POs									
2019		BBA							
Sem	Course Code	Title of the Course	COs	POS					
				PO1	PO2	PO3	PO4	PO5	PO6
I	19110AEC11	Tamil I	CO:1 Learn the changes occurred in literature since classical period.	*	*				
			CO:2 Make use of vocabulary systematically.	*					
			CO:3 Understand how to lead one's life realizing the modernity and its environment/atmosphere.	*	*	*			
	19111AEC12	English I	CO:1 Develop vocabulary	*	*				
			CO:2 zarLearn to edit and do proof reading	*	*				
			CO:3 Read and comprehend literature	*	*	*			
	19160SEC13	Core - I Principles of Management	CO:1 Understanding the fundamental of financial accounting				*	*	*
			CO:2 Develop the modern market economy				*	*	
			CO:3 prepare the different kinds of financial statement				*	*	*

19160SEC14	Core - II Managerial Economics	CO:1 Understanding the fundamental of financial accounting				*	*	*
		CO:2 Develop the modern market economy				*	*	
		CO:3 prepare the different kinds of financial statement				*	*	*
		CO:4 Acquire conceptual knowledge of basics of accounting				*	*	
		CO:5 Identify and analyze the reasons for the difference between cash book and pass book balances					*	*
		CO:6 Develop the skill of recording financial transactions and preparation of reports in accordance with GAAP				*	*	*
19160AEC15	Allied- I Business Communication	CO:1 Discuss the supply and demand theory and its impact on insurance				*	*	
		CO:2 outline an how entity operate in the Business environment			*	*		
		CO:3 Explain the legal frame work that regulate the insurance industry					*	*
		CO:4 Understand relationship between environment and business; Applying the environmental analysis techniques in practice						*
		CO:5 Understand Economic, Socio-Cultural and Technological Environment				*		*

19160AEC16	Allied- II Business Mathematics and Statistics	CO:6 Know state policies Economic legislations and Economic reforms laid by the government						
		CO:1 Understand fundamental marketing concepts, theories and principles in areas of marketing policy				*		*
		CO:2 Apply the knowledge, concepts, tools necessary to understand challenges				*	*	*
		CO:3 Understand the marketing concepts and its evolution				*		*
		CO:4 Analyze the market based on segmentation, targeting and positioning				*	*	*
		CO:5 Know the consumer behavior and their decision making process				*	*	*
		CO:6 Understand the rural markets and the contemporary issues in marketing				*	*	*
		Co:7 Make decisions on product, price , promotion mix and distribution				*		*
19120SEC01A L	Skill Based Elective Course - I	CO:1 Apply the concept of opportunity cost.				*	*	*
		CO:2 understand the concepts of cost, nature of production and its relationship to Business operations.				*	*	*
		CO:3 Apply Economic theories to business decision				*		*

19111SEC01L	Communicative English Lab - I	CO:4 Use the theoretical concept of demand and supply analysis in practice				*	*	
		CO:5 Understand the cost concepts, theories of profit and business cycles				*	*	*
		CO:6 Use different demand forecasting techniques and apply different pricing techniques in business				*		*
		CO:7 Understand the importance of Fiscal policy				*		*
		1. Recognize when to use each of the Microsoft Office programs to create professional and academic documents.						*
		2. Use Microsoft Office programs to create personal, academic and business documents following current professional and/or industry standards.					*	*
		3. Apply skills and concepts for basic use of computer hardware, software, networks, and the Internet in the workplace and in future coursework as identified by the internationally accepted Internet and Computing Core (IC3) standards.					*	*
191ETHVALS	Ethics and Values	CO:1 Learn grammar.	*	*	*			
		CO:2 Enrich vocabulary	*	*	*			

II	19110AEC21	Tamil II	CO:3 Understand the process of communication	*	*	*			
			CO:4 Develop listening skill	*	*	*			
			CO:1 Know what devotion really is.	*	*				
		English II	CO:2 Know the fruitfulness obtained through devotion.	*	*				
			CO:3 Perceive the progress achieved in the society through devotion.	*		*			
			CO:1 Develop technological skill.	*	*	*			
	19111AEC22		CO:2 Able to write in a variety of formats	*	*	*			
			CO:3 Read biographies and develop personality	*	*	*			
			CO:1 Appreciate different forms of literature		*	*			
	19160SEC23	Core - III Financial Accounting	Co:2 Acquire language skills through literature	*		*			
			Co:3 Broadens the horizon of knowledge	*		*			
			CO:1 familiarize the concept of Branch account and its system				*	*	*
19160SEC24	Core - IV Organizational Behaviour	CO:2 understand the Scope of departmental accounting				*	*		
		CO:3 Appreciate the need for negotiable instruments and procedure of accounting for bills honoured and dishonoured				*	*		
		CO:4 Differentiate Trade bills from Accommodation Bills				*	*	*	

		CO:5 Understand the concept of Consignment and learn the accounting treatment of the various aspects of consignment			*	*	
	Allied-III Business Environment	CO:1 Understand, and evaluate various organizational influences affecting ethical decisions			*	*	
		CO:2 Present and analyze ethical and moral issues			*	*	
		CO:3 Explore ethical theories			*	*	
		CO:4 Use contemporary and classical frameworks to analyze and suggest resolutions to ethical dilemmas.			*	*	
		CO:5 Identify and address common ethical issues that arise for individuals, managers, and organizations.			*	*	
		CO:6 Recognize how individual differences and cognitive barriers can influence ethical judgment.			*	*	
		CO:7 Identify and prioritize personal values and apply those to making ethical decisions.			*	*	
	Allied-IV Management Information System	CO:1 Critically evaluate the underlying assumptions of analysis tools			*	*	
		CO:2 Solve a range of problems using the techniques covered			*	*	
19160AEC25							
19160AEC26							

19160RLC27

Research Led Seminar

CO:3 Conduct basic statistical analysis of data.				*	*	
CO:4 Understand basic statistical concepts such as statistical collection, statistical series, tabular and graphical representation of data				*	*	
CO:5 Calculate measures of central tendency, dispersion and asymmetry, correlation and regression analysis				*	*	
CO:6 Choose a statistical method for solving practical problems				*	*	
CO: 1 Understand the dynamics of marketing in business				*	*	*
CO:2 ability and confidence to tackle common practical financial problems of business.				*	*	*
CO:3 Understand the scope of Business, and its importance.				*	*	*
CO:4 Identify different forms of business organizations viz; Sole Proprietorship, Partnership, Joint Hindu Family Business & Co-operative Organizations.				*	*	
CO:5 Understand a Joint Stock Company and various formalities to promote a Company				*	*	
CO:6 Learn various sources Industrial				*	*	*

III	19120SEC02A L	Skill Based Elective Course - II	Financial resources and the means to raise them						
			CO:1. Identify the names and functions of the PowerPoint interface.		*	*			
			CO:2. Create, edit, save, and print presentations.		*	*			
			CO:3. Format presentations.		*	*			
			CO:4. Add a graphic to a presentation.		*	*			
			CO:5. Create and manipulate simple slide shows with outlines and notes.		*	*			
	19111SEC02L	Communicative English Lab - II	CO:6. Create slide presentations that include text, graphics, animation, and transitions.		*	*			
			CO:1 Learn grammar.	*	*	*			
			CO:2 Use a variety of reading strategies	*	*				
			CO:3 Enhance the skill of making grammatically correct sentences.	*	*	*			
	19110AEC31	Tamil III	Co:4 Develop listening skill	*	*	*			
			CO:1 Achieve one's goal by following the ancestral path		*	*			
CO:2 Learn to lead life of perfection by realizing the uncertainty in the life				*	*				
19111AEC32	English III	CO:3 Attain happiness through honesty		*	*				
		CO:1 Understand phonetics.	*	*	*				
			CO:2 Develop writing skill	*	*	*			

19160SEC33	Core – V Management Accounting	CO:3 Able to develop creative writing	*	*	*			
		CO:1 Enable to appreciate different types of prose	*	*				
		CO:2 Develop the conversational skills through one-act plays	*					
		CO:3 Enhance the skill of making grammatically correct sentences.	*	*	*			
19160SEC34	Core – VI Marketing Management	CO:1 Understand various costing systems and management systems				*	*	*
		CO:2 Analyse and provide recommendations to improve the operations of organisations				*	*	
		CO:3 Imbibe conceptual knowledge of cost accounting.				*	*	
		CO:4 Understand the significance of cost accounting in the modern economic environment				*	*	
		CO:5 Select the costs according to their impact on business				*	*	*
		CO:6 Apply cost accounting methods to evaluate and project business performance				*	*	*
19160AEC35	Allied- V Business Law	CO:1 Understanding of Banking Channels and Payments				*	*	
		CO:2 Practices on Banking Technology				*	*	*
		CO:3 Understanding of Core Banking				*	*	*

19160AEC36	Allied- VI Human Resource Management	CO:4 To gather knowledge on banking and financial system in India				*	*	*
		CO:5 Understand better customer relationship				*	*	*
		CO:6 To create awareness about modern banking services like e-banking, m-banking and internet banking				*	*	*
		CO:1 Explain the concepts in business laws with respect to foreign trade			*	*	*	
		CO:2 Apply the global business laws to current business environment				*	*	
		CO:3 Demonstrate an understanding of the Legal Environment of Business.				*	*	
		CO:4 Communicate effectively using standard business and legal terminology.			*	*	*	
		CO:5 Demonstrate recognition of the requirements of the contract agreement			*	*	*	
		CO:6 Identify contract remedies				*	*	
		CO:7 Understand the various provisions of Company Law			*	*	*	
19160RMC37	Research Methodology	CO:1 Identify ethical, legal, cultural, and global issues affecting business communication.			*	*		
		CO:2 Utilize analytical and problem solving skills appropriate to business communication.	*		*	*	*	

19120SEC03A
L

Skill Based
Elective
Course - III

Co:3 Effective business writing	*	*	*			
CO:4 Research approaches and information collection.			*	*		
CO:5 Developing and delivering effective presentations			*	*		
CO:6 Effective interpersonal communicat ions	*		*			
CO:7 Skills that maximise team effectiveness.			*	*		*
CO:8 Good time management.					*	*
CO:1 Able to carry out independent literature survey corresponding to the specific publication type and assess basic literary research tools.			*			
CO:2 familiarize participants with basic of research and the research process.			*	*		
CO:3 enable the participants in conducting research work and formulating research synopsis and report.			*			
CO:4 Develop understanding on various kinds of research, objectives of doing research, research process, research designs and sampling.			*			
CO:5 Have basic knowledge on qualitative research techniques			*			

19111SEC03L	Communicative English - III	CO:6 Have adequate knowledge on measurement & scaling techniques as well as the quantitative data analysis			*					
		CO:7 Have basic awareness of data analysis- and hypothesis testing procedures			*					
		CO:1. Indicate the names and functions of the Excel interface components.		*	*					
		CO:2. Enter and edit data.		*						
		CO:3. Format data and cells.		*						
		CO:4. Construct formulas, including the use of built-in functions, and relative and absolute references.		*						
		CO:5. Create and modify charts.		*						
		CO:6. Preview and print worksheets.		*						
		19110AEC41	Tamil IV	CO:1 Realize how the ancient people changed their life style according to the ages		*	*			
				CO:2 Learn how to change one's lifestyle according to the needs of the future		*	*			
CO:3 Accept the modern trends and its uses				*	*					
19111AEC42	English IV	CO:1 Develop writing skill.	*	*	*					
		CO:2 Comprehend and describe poems	*	*	*					
		CO:3 Learn interviewing skills	*	*	*					

19160SEC43	Core - VII Total Quality Management	CO:1 Improve their ability to read and understand them	*	*	*			
		CO:2 Know the genius of Shakespeare	*	*	*			
		CO:3 Express in writing their views.	*	*	*			
19160SEC44	Core - VIII Cost Accounting	CO:1 Understand the concept of partnership				*	*	*
		CO:2 Understand the journal entries for the formation of partnership				*	*	*
		CO:3 Familiarize the concept of Branch account and its system				*	*	
		CO:4 Understand the Scope of departmental accounting				*	*	
		CO:5 Introduce the system of Hire Purchasing				*	*	
		CO:6 Understand partnership account from admission to dissolution				*	*	
19160AEC45	Allied -VII Retail Management	CO:1 Understand the key principles and tools of integrated marketing communication				*	*	
		CO:2 Explain the environmental factors which influence consumer and organizational decision				*	*	*
		CO:3 Identify the elements of the communication process between buyers and sellers in business. making process				*	*	*

19160AEC46

Allied -VIII
Industrial
Relations and
Labour Law

CO:4 Identify the marketing mix components in relation to market segmentation				*	*	
CO:5 Outline a marketing plan				*	*	
CO:6 Utilize marketing research techniques to resolve into competitive marketing decisions.				*	*	*
CO:1 Get a basic understanding of different type of meeting of board of directors.				*	*	
CO:2 Use international trade terms and concepts when communicating.	*		*	*		
CO:3 Demonstrate comprehensive knowledge and understanding of social and economic policy considerations arising in this area.				*	*	
CO:4 Understanding of those areas of company law identified in the indicative syllabus above and form a critical judgement on areas of controversy within the topics studied;				*	*	
CO:5 Read and study primary and secondary sources of company law, with minimal staff guidance; critically analyse, interpret, evaluate and synthesise information from a variety of sources				*	*	*

		CO:6 Identify sources for research and further develop a strategy for research using standard and electronic research toolsC				*	*	
	Skill Based Elective Course - IV	CO:1 Examine database concepts and explore the Microsoft Office Access environment.		*				
		CO:2. Design a simple database.		*				
		CO:3. Build a new database with related tables.		*				
		CO:4. Manage the data in a table.		*				
		CO:5. Query a database using different methods.		*				
		CO:6. Design a form.		*				
		CO:7. Generate a report.		*				
		CO:8. Import and export data.		*				
	Communicative English - IV	CO:1 Learn grammar.	*	*	*			
		CO:2 Enable to express their views in conversation	*	*				
		CO:3 Develop soft skills	*	*				
		Co:4 ce presentation skills	*	*				
	Environmental Studies	CO:1 Learn about environmental pollution.		*	*			
		CO:2 Familiarize with the social issues and the environment		*	*			
		CO:3 will be able to do independent research on human interactions with the environment.		*	*			
19120SEC04A L								
19111SEC04L								
191ENVTSTU								

V

19160SEC51

Core - IX
Financial
Management

CO:4 To recognize the physical, chemical, and biological components of the earth's systems and show how they function		*	*			
CO:5 Analyze and evaluate ideological and philosophical approaches used to understand environmental relationships.		*	*			
CO:6 Carry out an applied research project in the natural sciences.		*	*			
Co:1 Find out how can a company dissolve.				*	*	
CO:2 Understand Mutual funds investments.				*	*	*
CO:3 Learn about Working format of companies.				*	*	
CO:4Enabling the students to understand the features of Shares and Debentures				*	*	
CO:5Develop an understanding about redemption of Shares and Debenture and its type				*	*	*
CO:6 Exposure to the company final accounts				*	*	*
CO:1 Use business finance terms and concepts when communicating.	*				*	*
CO:2 Demonstrate a basic understanding of financial management.				*	*	*
CO:3 Provide introduction to Financial Management				*	*	*

19160SEC52

Core - X
Services
Marketing

		CO:4 Create an awareness about capital structure and theories of capital structure				*	*	
		CO:5 Make them understand the cost of capital in wide aspects				*	*	
		CO:6 Provide knowledge about dividend policies and various dividend models.				*	*	
		CO:7 Enable them to understand working capital management				*	*	
	Core – XI Production and Operations Management	CO:1 Forecast a firm's future financing requirements				*	*	*
		CO:2 Design an optimal capital structure.				*	*	
		CO:3 Give an idea about fundamentals of financial services and players in financial sectors				*	*	
		CO:4 Create an awareness about merchant banking, issue management, capital markets and role of SEBI				*	*	
		CO:5 Provide knowledge about leasing and hire purchase concepts				*	*	*
		CO:6 Make them understand about different types of insurance and IRDA Act.				*	*	
	Core – XII Global Business Management	Co1:Study the development of computers and their components in each stage.						*
		CO2 : Develop an idea of software, programming		*				
19160SEC53								
19160SEC54								

19160DSC55

Discipline
Specific
Elective - I
Participation
Bounded
Research

language and operating system.						
CO3 : Study the concept of developing database and its maintenance using computers in a business Concern				*		*
CO4 :Analyze the importance of management information system and networking in a business.				*	*	*
CO5 : Be aware and perform various activities using computers in day to day life.				*	*	*
CO:1 Know about the company law in the India.				*	*	
CO:2 Understand the use of the memorandum of association and article of association in a company, they also learn from this course				*	*	
CO:3 Develop Professionals in the filed of Co-operation, Co-operative law and Management.				*	*	
CO:4 Promote qualified, Skilled and professional manpower to manage the affairs of the Cooperative Institutions.				*	*	*
CO:5 Enhance the Knowledge base of the in-service Personnel on the subject Co-operation, Co-operative law and Co-operative Management.				*	*	*

		CO:6 Enable the in-service personnel to develop skills on Co-operative Management Techniques				*	*	
19160BRC55	Participation Bounded Research	CO:1 Do the allotted work in research			*			
		CO:2 Learn to do review of literature			*			
		CO:3 Demonstrate knowledge of research processes			*			
		CO:4 Perform literature reviews using print and online database			*			
		CO:5 Identify, explain, compare, and prepare the key elements of a research proposal/report			*			
		CO:6 Describe sampling methods, measurement scales and instruments, and appropriate uses of each			*			
19120SEC05A L	Skill Based Elective Course - V	CO:1 work with the Photoshop workspace		*				
		CO:2. navigate images		*				
		CO:3. resize and crop images		*				
		CO:4. make and work with selections		*				
		CO:5. create new layers and perform other basic layer functions		*				
		CO:6. transform images		*				
19111SEC05L	Communicative English Lab- V	CO:1 Develop corporate skills.		*	*			
		CO:2 Handle their day to day affairs well with their	*	*	*			

VI

		knowledge of language skills.							
	19160SEC61	Core - XIII Business Policy and Strategic Management	CO:1 Prepare analysis of various special decisions, using relevant costing and benefits				*	*	*
			CO:2 More effective planning and control systems				*	*	
			CO:3 The students thought and knowledge on management Accounting				*	*	
			CO:4 Helps to give proper idea on financial statement analysis in practical point of view				*	*	*
			CO:5 Introduce the concept of fund flow and cash flow statement				*	*	
			CO:6 Provide knowledge about budget control keeping in mind the scope of the concept				*	*	
			CO:7 Develop the know-how and concept of marginal costing with practical problems				*	*	*
	19160SEC62	Core – XIV Entrepreneurial Development	CO:1 Understand the systematic process to select the business ideas.				*	*	*
			CO:2 Write a business plan		*		*	*	*
			CO:3 Develop students about Entrepreneurship development				*	*	*
			CO:4 Create an awareness on various Entrepreneurship Development Programme				*	*	*

		CO:5 Enable them to understand project formulation				*	*	*
		CO:6 Familiarize the students with EDP schemes				*	*	*
	Core – XV Logistics and Supply Chain Management	CO:1 Articulate knowledage of fundamental audit concepts				*	*	
		CO:2 Apply critical thinking skills and solve auditing Problems.				*	*	*
19160SEC63		CO:3 Apply and demonstrate the accounting knowledge and skills in Auditing.				*	*	*
		CO:4 Explain how analytical procedures are used as an audit tool.				*	*	
		CO:5 Illustrate effective internal controls				*	*	
		CO:6 Apply ethical standards to issues in auditing				*	*	
	Discipline Specific Elective – II	CO:1 File IT Return on individuals basis				*	*	*
		CO:2 Compute the total Income and Define tax complicacies and structure.				*	*	*
19160DSC64		CO:3 In order to familiarize the different know-how and heads of income with its components				*	*	*
		CO:4 It helps to build an idea about income from house property as a concept				*	*	*

191--OEC65	Open Elective	CO:5 It give more idea about the income from business or profession				*	*	*
		CO:6 Make the students familiarizes with the concept of depreciation and its provisions				*	*	*
		CO:1 Greater Social support			*	*	*	
		CO:2 More on-task behaviour				*	*	*
		CO:3 Develop Professionals in the filed of Co-operation, Co-operative law and Management.				*	*	*
		CO:4 Promote qualified, Skilled and professional manpower to manage the affairs of the Cooperative Institutions.				*	*	*
		CO:5 Enhance the Knowledge base of the in-service Personnel on the subject Co-operation, Co-operative law and Co-operative Management.				*	*	*
19160PRW66	Project Work	CO:6 Enable the in-service personnel to develop skills on Co-operative Management Techniques				*	*	*
		CO:1 To help to gather knowledge on banking and financial system in India						
		CO:2 To provide knowledge about commercial banks and its products				*	*	*
		CO:3 Aim to familiarize banking system in India				*	*	*

19120SEC06A

Case Study
Analysis

CO:4 To enable them to understand better customer relationship			*	*	*	*
CO:5 To create awareness about modern banking services like e-banking,m-banking and internet banking, ATM System				*	*	*
CO:6 To introduce recent trends in banking system				*	*	*
CO:7 To make the student understand the basic concept of banking and financial institutions and expose various types of risk based by banks				*	*	*
CO:1 Develop plans with relevant people to achieve the project's goals			*	*	*	*
CO:2 Break work down into tasks and determine handover procedures				*	*	*
CO:3 Identify links and dependencies, and schedule to achieve deliverables				*	*	*
CO:4 Estimate and cost the human and physical resources required, and make plans to obtain the necessary resources				*	*	*
CO:5 Allocate roles with clear lines of responsibility and accountability.		*				
CO:6 Have adequate knowledge on measurement & scaling techniques as well as the quantitative data analysis				*		

19111SEC06L	Communicative English Lab - VI	CO:1. Learn to create animated graphics add sound and interactivity.		*				
		CO:2. Can develop Website		*				
		CO:3. CD based presentations		*				
191EXACT	Extension Activity	CO:1 Get a job	*	*	*			
		CO:2 Apply study skills	*	*				
		CO:3 Widen creative thinking	*	*	*			
		CO:4 Be a good team worker	*	*	*			
		CO:5 Make them proficient in English	*	*	*			
19160PEE	Programme Exit Examination	CO:1 Develop plans with relevant people to achieve the project's goals	*	*	*			
		CO:2 Break work down into tasks and determine handover procedures	*	*	*			
		CO:3 Identify links and dependencies, and schedule to achieve deliverables		*				
		Skill Based Elective Courses						
	Course Code	Course Title	COS	POS				

				PO1	PO2	PO3	PO4	PO5	PO6
	19120SEC0 1A	Fundamentals of Computers	To familiarize the students to the basic concepts of management in order to aid in understanding how an organization functions, and in understanding the complexity and wide variety of issues managers face in today's business firms.						
	19160SEC0 1B	Soft Skills – I	To provide an overview of theories and practices in organizational behavior in individual, group and organizational level.	*	*				
	19120SEC0 2A	Ms office Packages Lab	To acquaint the students with the fundamental principles of financial, cost & Management Accounting. Enable the students to take decisions using management accounting tools and to exposes the students to various concepts and principles of accounting for making efficient decisions.	*					

	19160SEC0 2B	Soft Skills- II	To make the students aware of the various economic theories and principles - To equip them with the required tools and techniques for improving their decisionmaking skills.	*	*	*			
	19120SEC0 3A	Writing and Presentatio n Skills Lab	To create the knowledge of Legal perspective and its practices to improvise the business.	*	*				
	19160SEC0 3B	Soft Skills – III	This course mainly deals with the use of Statistical concepts in the resolution of managerial decision problems. As such the course will deal not only with some of the theoretical concepts in Statistics but will also be concerned with their application.	*	*				
	19120SEC0 4A	General Aptitude and Personality Developme nt Lab	Facilitate student to understand the operational nuances of a Finance Manager Comprehend the technique of making decisions related to finance function	*	*	*			

	19160SEC0 4B	Soft Skills – IV	To provide knowledge about management issues related to staffing, training, performance, compensation, human factors consideration and compliance with human resource requirements.	*	*	*			
	19120SEC0 5A	Photoshop Lab	To understand fundamental concepts of Marketing in Modern Marketing Practices	*	*				
	19160SEC0 5B	Soft Skills – V	To provide a broad introduction to the field production and operations management and explain the concepts, strategies, tools and techniques for managing the transformation process that can lead to competitive advantage.	*	*	*			

		MBA 2019 PO CO								
2019		MBA								
Sem	Course Code	Title of the Course	COs	POS						
				PO1	PO2	PO3	PO4	PO5	PO6	
I	19260SEC11	Management Concepts	CO:1 This specialization lays the necessary groundwork for an overall successful marketing strategy	*	*				*	
			CO:2 knowledge required to understand the state of your product before approaching the market strategy	*	*				*	
			CO:3 Interpret development of marketing research	*	*				*	
			CO:4 Identify the major influences in Consumer Behaviour	*	*				*	
	19260SEC12	Organizational Behaviour	CO:1 Contribute to the development, implementation, and evaluation of employee recruitment, selection, and retention plans and processes	*	*				*	
			CO:2 Develop, implement, and evaluate employee orientation, training, and development programs.	*	*				*	
			CO:3 Understanding of the basic concepts, functions and processes of HRM	*	*				*	
	19260SEC13	Accounting for Managers	CO:1 Focuses on services, service design, and service innovation, with the aim of developing empathy for customers and understanding the customer experience	*	*				*	*

		CO:2 strategies that support broader marketing decisions.	*	*			*	
		CO:3 Develop an understanding of the role of relationship marketing and customer service	*	*			*	
		CO:4 Demonstrate a knowledge of the extended marketing mix for services.	*	*			*	*
		CO:5 Exhibit the capability to work effectively within a team environment.	*	*			*	
		CO:6Develop and Justify marketing planning and Control Systems.	*	*			*	
19260SEC14	Economics for Managers	CO:1 Study of decision making and performance evaluation techniques in management accounting	*	*				
		CO:2 Understand decision making and performance evaluation techniques in management accounting.	*	*	*	*		
		CO:3 In modern competitive business environment, suitable business decision making is very crucial	*	*	*			
		CO:4 Identify relevant information for decision making purposes in order to produce financial analyses for a range of decisions such as product-mix, pricing, outsourcing and special orders.	*	*	*	*		
		CO:5 Use standard costs to prepare budgets for planning and control purposes.	*	*	*	*		
		CO:6 Understand the principles of standard costing.	*	*	*	*		
19260SEC15	Legal Aspects of Business	CO:1examine the differences and similarities between leadership, power, and management	*	*			*	
		CO:2 impact that a company's structure and design can have on its organizational behavior	*	*			*	
		CO:3 impact of culture on organizational behavior	*	*			*	
		CO:4 Analyze management issues as related to organizational behavior	*	*			*	

		CO:5 Examine challenges of effective organizational communication	*	*			*	
		CO:6 Evaluate ethical issues as related to organizational behavior	*	*			*	
19260SEC16	Statistics for Managers	CO:1 Develop skills in data collection and complex analysis					*	
		CO:2 Clarify terminology and approaches to different facets of research-based teaching	*	*				
		CO:3 Explore good practices in institution-driven, strategic approaches on how to integrate research and education missions	*	*				
		CO:4 Generate ideas on how to build the capacity of faculty members to implement researchbased teaching	*	*				
		CO:5 create a research-based learning environment	*	*				
		CO:6 Analyse national frameworks, policies and funding	*	*				
19220SEC01	Managerial Skill Development - Lab	CO:1 Employ basic statistical methods to decision making	*	*				
		CO:2 Understand how to apply basic models and theories in business	*	*		*		
		CO:3 Solve management problems effectively	*	*		*		
		CO:4 Use software tools to model decision problems.	*	*				
		CO:5 Clearly identify an otherwise unstructured business problem and its components	*	*		*		
		CO:6 Employ effective techniques for addressing the major challenges presented	*	*				
		CO:7 Provide a solution to the decision process	*	*		*		

	19260CRS17	Research Led Seminar	CO:1 Given a product or a service type, the student manager will be able to enumerate and justify the dimensions of product quality or service quality for the same	*	*			*		
			CO:2 Given the quality gurus (Deming/ Juran/ Taguchi/ Crosby), the student manager will be able to justify their philosophies/ contributions in Quality Management.	*	*			*		
			CO:3 Given a quality problem/ failure mode, the student manager will be able to identify causes and sub causes of the effect/ problem draw and justify Ishikawa Diagram.	*	*			*		
			CO:4 For a given type of organization, the student manager will be able to enlist and justify the four levels of benchmarking and/ or enlist and brief seven step benchmarking model	*	*			*		
II	19260SEC21	Financial Management	CO:1 Activity based approaches to management and cost analysis	*	*	*	*			
			CO:2 Analysis of common costs in manufacturing and service industry	*	*	*	*			
			CO:3 Techniques for profit improvement, cost reduction, and value analysis	*	*	*	*			
			CO:4 Throughput accounting	*	*	*				
			CO:5 Target costing; cost ascertainment and pricing of products and services	*	*	*	*			
			CO:6 Pricing Decisions	*	*	*	*			
			CO:7 Budgets and Budgetary Control	*	*	*	*			
			CO:8 Evolution of standards, continuous - improvement; keeping standards meaningful and relevant; variance analysis	*	*	*	*			

		CO:6 Distinguish Joint Venture and Partnership and to learn the methods of maintaining records under Joint Venture	*	*	*	*		
		CO:7 Understand the meaning and features of Non-Profit Organisations	*	*	*			
		CO:8 Learn to prepare Receipts & Payment Account, Income & Expenditure Account and Balance Sheet for Non-Profit Organizations	*	*	*	*		
19260SEC22	Human Resource Management	CO:1 The role that retailing plays in the distribution component of the marketing mix	*	*			*	
		CO:2 Understanding of the concept of social responsibility and the role it plays in retailin	*	*			*	
		CO:3 Aware of the moral and ethical dilemmas that face the retailing industry in today's business environment	*	*			*	
		CO:4 Development and understanding of implementing a retail strategy.	*	*			*	
		CO: 5 Understanding of the increased use of technology in the field of retailing	*	*			*	
		CO:6 Identify key roles within retail businesses	*	*			*	
19260SEC23	Marketing Management	CO:1 Demonstrate knowledge of research processes (reading, evaluating, and developing)	*	*		*		
		CO:2 Perform literature reviews using print and online databases	*	*		*		
		CO:3 Identify, explain, compare, and prepare the key elements of a research proposal/report	*	*		*		
		CO:4 Select and define appropriate research problem and parameters	*	*		*		
		CO:5 Prepare a project proposal (to undertake a project)	*	*		*		

		CO:6 Understand some basic concepts of research and its methodologies	*	*		*		
19260SEC24	Production & Operations Management	CO:1 Develop understanding on various kinds of research, objectives of doing research, research process, research designs and sampling.	*	*		*		
		CO:2 Have basic knowledge on qualitative research techniques	*	*		*		
		CO:3 Have adequate knowledge on measurement & scaling techniques as well as the quantitative data analysis	*	*		*		
		CO:4 Have basic awareness of data analysis-and hypothesis testing procedures	*	*		*		
		CO:5 knowledge for enabling students to develop data analytics skills and meaningful interpretation to the data sets so as to solve the business/Research problem.	*	*		*		
		CO:6 Describe sampling methods, measurement scales and instruments, and appropriate uses of each	*	*		*		
19260RMC2 5	Research Methodology	CO:1 Understand the How Subcontract Administration and Control are practiced in the Industry.	*	*			*	
		CO:2 Understand the contract management, Project Procurement, Service level Agreements and productivity	*	*			*	
		CO:3 Apply the risk management plan and analyse the role of stakeholders.	*	*			*	
		CO:4 Analyze the learning and understand techniques for Project planning, scheduling and Execution Control.	*	*		*		
		CO:5 Understand the conceptual clarity about project organization	*	*			*	

		CO:6 Understand project characteristics and various stages of a project	*	*		*		
19260SEC26	Strategic Management	CO:1 Critically analyse both older and newer MA methods and their effects in organisations	*	*	*	*		
		CO:2 knowledge and understanding about MA issues, including its problems and difficulties	*	*	*	*		
		CO:3 Part in the design and use of the management accounting system in organisations	*	*	*	*		
		CO:4 Updated concerning the more recent development in MA and the emergence of new methods	*	*	*	*		
		CO:5 More advanced level compared to the basic knowledge acquired on the Bachelor level	*	*	*	*		
		CO:6 Exposure to the company final accounts	*	*	*	*		
19220SEC02	Data Analysis Lab	CO:1 Knowledge, understanding and skills in the area of international financial relations and tolls for its implementation	*	*	*			*
		CO:2 Knowledge and understanding of characteristics, activities, principles and specifics of international financial relations	*	*				*
		CO:3 Ability to summarize and critically evaluate results obtained by researchers in the field of international financial relations	*	*				*
		CO:4 Ability to analyse and use various sources of information and data in the field and make assessment	*	*				*
		CO:5 Use methods in the field of international finance in practice;	*	*				*
		CO:6 Economic essence and currency classifications: the concept of currency and its basic classification; characteristics of currencies.	*	*				*

	19260BRC27	Participation in Bounded Research	CO:1 To introduces meaning and functions of Financial Intermediaries	*	*	*			
			CO:2 To understand the role of merchant bank and its services	*	*	*			
			CO:3 To provide information regarding management of mutual funds and Regulations	*	*	*			
			CO:4 To understand the role and functions of financial services Marketing	*	*	*			*
			CO:5 To know the structure and types of debt Instruments	*	*	*			
			CO:6 To realize Foreign Exchange Market	*	*	*			*
III	19260SEC31	International Business Environment	CO:1 to help students manage individual or team projects.	*	*			*	
			CO:2 Begin project-planning with a specific audience with a specific and pressing concern	*	*			*	
			CO:3 Let students design their own projects. Or require that projects iterate or counter existing cultural trends and patterns or that address compelling social concerns (e.g.technology addiction).	*	*			*	
			CO:4 Use concept-mapping before, during, and after the project is completed.	*	*			*	
			CO:5 Give students the opportunities to use their specific gifts, skills, and backgrounds in completing the project.	*	*			*	
			CO:6 Help students brainstorm the opportunities for creative risk-taking at the beginning of a project.	*	*			*	
			19260SEC32	Operations Research	CO:1 File IT Return on individuals basis	*	*		*
	CO:2 Compute the total Income and Define tax complicacies and structure.	*			*		*		

		CO:3 In order to familiarize the different know-how and heads of income with its components	*	*		*		
		CO:4 It helps to build an idea about income from house property as a concept	*	*		*		
		CO:5 It give more idea about the income from business or profession	*	*		*		
		CO:6 Make the students familiarizes with the concept of depreciation and its provisions	*	*		*		
19260SRC33	Design/Socio-Technical Project	CO:1 Have developed an understanding of major issues related to international Business	*	*				*
		CO:2 Have developed skills in researching and analyzing trends in global markets and in modern marketing practice	*	*				*
		CO:3 An organization's ability to enter and compete in international markets.	*	*				*
		CO:4 Develop skills in researching and analyzing international Business opportunities	*	*				*
		CO:5 Develop a high level of analytical skills and critical thinking in an international Business contex	*	*				*
		CO:6 Explain the main institutions that shape the global marketplace;	*	*				*
19260SEC41	Entrepreneurial Development	CO:1 Know about the company in the Abroad.	*	*				*
		CO:2 Understand the use of the memorandum of association and article of association in a company, they also learn from this course	*	*			*	
		CO:3 Develop Professionals in the filed of Project	*	*			*	
19260PRW4 4	Project Work	CO:1 Have developed an understanding of major issues related to international Business	*	*				*

			CO:2 Have developed skills in researching and analyzing trends in global markets and in modern marketing practice	*	*					*	
			CO:3 An organization's ability to enter and compete in international markets.	*	*					*	
			CO:4 Develop skills in researching and analyzing international Business opportunities	*	*					*	
			CO:5 Develop a high level of analytical skills and critical thinking in an international Business context	*	*					*	
	19260PEE	Programme Exit Exam	CO:1 Have developed an understanding of major issues related to international Business	*	*					*	
				CO:2 Have developed skills in researching and analyzing trends in global markets and in modern marketing practice	*	*					*
				CO:3 An organization's ability to enter and compete in international markets.	*	*					*
				CO:4 Develop skills in researching and analyzing international Business opportunities	*	*					*
	SPECIALIZATIONS										
	MARKETING										
2019		MBA									
Sem	Course Code	Title of the Course	COs	POS							
				PO1	PO2	PO3	PO4	PO5	PO6		
III	19260EA33	Consumer Behaviour	The basic objective of this course is to develop an understanding about the consumer decision making process and its applications in marketing function of firms.	*	*				*		

19260EA34	Integrated Marketing Communication	Due to ever increasing business dealings the subject of International Marketing has gained utmost importance in recent times. The world these days, indeed has shrunk and foreign markets have particularly become important especially for a developing country like India. The major objective of this course is to provide an exposure to the area of Marketing in the International perspective.	*	*			*		
19260EA35	Brand Management	The objective of this course is to introduce students to the basic scope, benefits and types of brands; and understand the steps involved in designing an appropriate brand for the organization.	*	*			*		
19260EA36	Retail Management	The objective of this course is to introduce students to the basic scope, benefits and types of retailers; and understand the steps involved in designing an appropriate retail organization structure.	*	*			*		
19260EA37	Sales Management	The purpose of this paper is to acquaint the student with the concepts which are helpful in developing a sound sales policy and in organizing and managing sales force and marketing channels and to impart the knowledge about sales management procedure, and activities.	*	*			*		
19260EA38	Services Marketing	The objective of the course is to develop an understanding of services and service marketing with emphasis on various aspects of service marketing which make it different from goods marketing.	*	*			*		
19260EA39	Industrial Marketing	A broad range of job profiles are available for individuals with a degree in industrial marketing courses, and many top companies provide various job offers for students engaged in this course degree. A Market Analyst helps companies and	*	*			*		

			organizations in decision making of products and services.						
IV	19260EA42	Customer Relationship Management	The paper is designed to impart the skill based knowledge of Customer Relationship Management. The purpose of the syllabus is to not just make the students aware of the concepts and practices of CRM in modern businesses but also enable them to design suitable practices and programs for the company they would be working.	*	*		*		
	19260EA43	International Marketing	The course has been developed so as to acquaint the students with environment, procedural, institutional and decisional aspects of International Marketing.	*	*		*		
	19260EA44	Rural Marketing	The objective of this course is to explore the students to Rural Marketing environment so that they can understand consumer's and marketing characteristics of the same for understanding and contributing to the emerging challenges in the upcoming global economic scenario.	*	*				*
	Human Resource								
2017		MBA							
Sem	Course Code	Title of the Course	COs	POS					
				PO1	PO2	PO3	PO4	PO5	PO6
III	19260EB33	Knowledge Management	The goal of the course is to prepare students to become familiar with the current theories, practices, tools and techniques in knowledge management (KM), and to assist students in pursuing a career in the information sector for profit and not for profit organizations. In addition, students will learn to	*	*			*	

		determine the infrastructure requirements to manage the intellectual capital in organizations.						
19260EB34	Organizational Development & Change management	The objective of this paper is to prepare students as organizational change facilitators using the knowledge and techniques of behavioral science.	*	*			*	
19260EB35	Performance Management	The objective of this course is to help the students gain understanding of the functions of performance management system in the organization and provide them tools and techniques to be used in appraising the performance of the employees.	*	*			*	
19260EB36	Labour Legislations	This course will help the student to get exposure on Industrial Law. Understand the relationship between the employee, employer, union and government and to have awareness of various industrial laws relating to employees.	*	*			*	
19260EB37	Compensation Reward Management	The course is designed to promote understanding of issues related to the compensation and rewarding human resources in the organizations and to impart skills in designing analyzing and restructuring reward management systems, policies and strategies.	*	*			*	
19260EB38	Cross Culture Management	The objective of this course is to develop a diagnostic and conceptual understanding of the cultural and related behavioral variables in the management of global organizations.	*	*			*	
19260EB39	Conflict and Negotiation Management	The course plan to develop an understanding of conflict dynamics and the art and science of negotiation. On the completion of syllabus, students will be in a position to answer the role that can be played by conflict resolution techniques such as mediation.	*	*			*	

IV	19260EB42	Industrial Relation	This course will help the student to get exposure on Industrial Relations. Understand the relations ship between the employee, employer, union and government	*	*		*		
	19260EB43	Training & Development	The objective of this course is to help the students gain understanding of the objectives of training in the organization and provide them tools and techniques to be used in training the employees. This paper will attempt to orient the students to tailor themselves to meet the specific needs of the organizations in training and development activities.	*	*		*		
	19260EB44	Talent Management	This course will help the student to get exposure on Talent management. Understand the how to acquire talent employees and how to retain such employees in the organization for effective performance and achievement of goals.	*	*				*
	FINANCE								
2017		MBA							
Sem	Course Code	Title of the Course	COs	POS					
				PO 1	PO 2	PO 3	PO 4	PO 5	PO 6
III	19260EC33	Security Analysis and Portfolio Management	The objective of this course is to impart knowledge +D477:D486to students regarding the theory and practice of Security Analysis and to give the students an in-depth knowledge of the theory and practice of Portfolio Management.	*	*				*
	19260EC34	Derivatives Management	To give an in-depth knowledge of the functioning of derivative securities market.	*	*				*
	19260EC35	Project Finance		*	*			*	

	19260EC36	Financial Services and Institutions	The objective of the course is to provide to the students a specialized knowledge of the techniques of evaluating proposed investments and to acquaint them with the problems encountered in the decisional process pertaining to capital investments of the project.	*	*		*			
	19260EC37	International Finance	This course provides an understanding of the following fund-based and fee-based financial services offered by financial intermediaries such as non-banking finance companies, banks and financial institutions. This course will also focus on issues concerning the financial management of financial intermediaries.	*	*		*			
	19260EC38	Insurance and Risk Management	To give the students an overall view of the international financial system – instruments and markets.	*	*		*			
	19260EC39	Corporate Finance	To provide the basics of insurance contracts and to explain the various types of insurance policies.	*	*		*			
IV	19260EC42	Micro Finance	Student will acquire Nuances involved in short term corporate financing, Good ethical practices	*	*		*			
	19260EC43	Strategic Financial Management	To enable the students to understand the principles, practices and application in Micro Finance.	*	*		*			
	19260EC44	Merchant Banking and Financial Services	To equip the students with necessary strategic knowledge and skills received to evaluate discussions or capital restructuring, mergers and acquisitions.	*	*					*
	Production and Operations									
2017		MBA								
Sem	Course Code	Title of the Course	COs	POS						
				PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	

III	19260ED33	Project Management	This course focuses on project management methodology that will increase the ability of students to initiate and manage projects more efficiently and effectively. Also they will learn key project management phases through an innovative model.	*	*			*	
	19260ED34	Planning and control of operations	This course is designed to acquaint the student with the methods of planning and control	*	*			*	
	19260ED35	Technology Management	This course helps to understand the dynamics of technological innovation and be familiar with how to formulate technology strategies	*	*			*	
	19260ED36	Logistics Management	The objective of this course is to get the exposure of logistics management and to understand the relationship between the logistics and packaging.	*	*			*	
	19260ED37	Supply Chain Management	The objective of this course is to get the exposure of supply chain management and to understand the relationship between the procurement and supply chain management	*	*			*	
	19260ED38	Business Process Reengineering	The objectives of this course are to acquaint the student with understanding process orientation in business management and develop skills and abilities in re-engineering and business process for optimum performance.	*	*			*	
	19260ED39	Material Management	To understand the working of a materials management department, Aspects of Stores management, Warehousing management and material requirement planning.	*	*			*	
19260ED42	*			*			*		
IV	19260ED42	Maintenance Management	To enable the students to understand the principles, practices and applications in Maintenance Management.	*	*			*	

	19260ED43	Service and Operation Management	To help understand how service performance can be improved by studying services operations management	*	*					*
	19260ED44	Product Design	To help Understand the application of structured methods to develop a product. Student gains knowledge on how a product is designed based on the needs of a customer	*	*					*
	LOGISTICS AND SUPPLY CHAIN MANAGEMENT									
2017		MBA								
Sem	Course Code	Title of the Course	COs	POS						
				PO1	PO2	PO3	PO4	PO5	PO6	
III	19260EE33	Purchasing and Procurement Management	The objective of this course is to impart knowledge to students regarding the theory and practice of Security Analysis and to give the students an in-depth knowledge of the theory and practice of Portfolio Management.	*	*			*		
	19260EE34	Material Management	To give an in-depth knowledge of the functioning of derivative securities market.	*	*			*		
	19260EE35	Inventory Management		*	*			*		
	19260EE36	Supply Chain Management	The objective of the course is to provide to the students a specialized knowledge of the techniques of evaluating proposed investments and to acquaint them with the problems encountered in the decisional process pertaining to capital investments of the project.				*	*	*	
	19260EE37	Logistics Management	This course provides an understanding of the following fund-based and fee-based financial services offered by financial intermediaries such as non-banking finance companies, banks and financial institutions. This course will also focus on issues concerning the financial management of financial intermediaries.				*	*	*	

	19260EE38	Custom House Practice And Legalities	To give the students an overall view of the international financial system – instruments and markets.			*	*	*	
	19260EE39	Export Trade And Documentation	To provide the basics of insurance contracts and to explain the various types of insurance policies.				*	*	*
IV	19260EE42	Quality Management	Student will acquire Nuances involved in short term corporate financing, Good ethical practices				*	*	*
	19260EE43	Air Cargo Logistics Management	To enable the students to understand the principles, practices and application in Micro Finance.				*	*	*
	19260EE44	Shipping And Ocean Freight Logistics Management	To equip the students with necessary strategic knowledge and skills received to evaluate discussions or capital restructuring, mergers and acquisitions.				*	*	*
	INTERNATIONAL BUSINESS								
2017		MBA							
Sem	Course Code	Title of the Course	COs	POS					
				PO1	PO2	PO3	PO4	PO5	PO6
III	19260EF33	International Marketing	The objective of this course is to impart knowledge to students regarding the theory and practice of Security Analysis and to give the students an in-depth knowledge of the theory and practice of Portfolio Management.	*	*			*	
	19260EF34	International Human Resource Management	To give an in-depth knowledge of the functioning of derivative securities market.	*	*			*	
	19260EF35	Cross Cultural Management		*	*			*	

	19260EF36	Global Logistics and Supply Chain Management	The objective of the course is to provide to the students a specialized knowledge of the techniques of evaluating proposed investments and to acquaint them with the problems encountered in the decisional process pertaining to capital investments of the project.				*	*	*
	19260EF37	International Trade Procedures	This course provides an understanding of the following fund-based and fee-based financial services offered by financial intermediaries such as non-banking finance companies, banks and financial institutions. This course will also focus on issues concerning the financial management of financial intermediaries.				*	*	*
			To give the students an overall view of the international financial system – instruments and markets.			*	*	*	
	19260EF38	International Strategic Management	To provide the basics of insurance contracts and to explain the various types of insurance policies.				*	*	*
	19260EF39	Global Business Ethics and Corporate Governance	To give the students an overall view of the international financial system – instruments and markets.				*	*	*
IV	19260EF42	Management Of International Developmental	To enable the students to understand the principles, practices and application in Micro Finance.				*	*	*
		Organizations	To equip the students with necessary strategic knowledge and skills received to evaluate discussions or capital restructuring, mergers and acquisitions.				*	*	*

	19260EF43	Merger and Acquisitions	The course is to sensitize the students to issues pertaining to sustainable development and business ethics and enable development and business ethics and enable them to understand the implications of various statutory and policy guidelines concerning corporate governance for actual business decision making.				*	*	*
	19260EF44	International Financial Management	The course is to sensitize the students to issues pertaining to sustainable development and business ethics and enable development and business ethics and enable them to understand the implications of various statutory and policy guidelines concerning corporate governance for actual business decision making.						
	SYSTEM								
2017		MBA							
Sem	Course Code	Title of the Course	COs	POS					
				PO1	PO2	PO3	PO4	PO5	PO6
III	19260EG33	Software Engineering	This course aims to understand the software engineering and apply the knowledge of a disciplined approach to the development of software and to the management of the software product lifecycle.				*	*	*
	19260EG34	Software Project Management	To give an in-depth knowledge of the functioning of derivative securities market.				*	*	*
	19260EG35	Relational Database Management				*	*	*	

	19260EG36	E- Business Technology Management	The objective of the course is to provide to the students a specialized knowledge of the techniques of evaluating proposed investments and to acquaint them with the problems encountered in the decisional process pertaining to capital investments of the project.				*	*	*
	19260EG37	Data Warehousing & Data Mining	This course provides an understanding of the following fund-based and fee-based financial services offered by financial intermediaries such as non-banking finance companies, banks and financial institutions. This course will also focus on issues concerning the financial management of financial intermediaries.				*	*	*
	19260EG38	Knowledge Management	To give the students an overall view of the international financial system – instruments and markets.				*	*	*
	19260EG39	Enterprise Resource Planning	To provide the basics of insurance contracts and to explain the various types of insurance policies.				*	*	*
IV	19260EG42	Information Storage & Management	Student will acquire Nuances involved in short term corporate financing, Good ethical practices				*	*	*
	19260EG43	Cloud Computing	To enable the students to understand the principles, practices and application in Micro Finance.						
	19260EG44	Decision Support System And Intelligent Systems	To understand the components of DSS and IS. To know the appropriate model to be used for a problem				*	*	*
	HOSPITAL MANAGEMENT								
2017		MBA							
Sem	Course Code	Title of the Course	COs	POS					
				PO1	PO2	PO3	PO4	PO5	PO6

III	19260EH33	Management Of Hospital Services	To enable the students gain insights into various aspects like importance, functions, policies and procedures, equipping, controlling, co-ordination, communication, staffing, reporting and documentation of both clinical and non clinical services in a hospital.	*	*			*	
	19260EH34	Operations Management In Health Care	To give an in-depth knowledge of the functioning of derivative securities market.				*	*	*
	19260EH35	Marketing Management Of Hospital And Health Care Services					*	*	*
	19260EH36	Community Health and Management of	The objective of the course is to provide to the students a specialized knowledge of the techniques of evaluating proposed investments and to acquaint them with the problems encountered in the decisional process pertaining to capital investments of the project.			*	*	*	
	19260EH37	National Health Programmes	This course provides an understanding of the following fund-based and fee-based financial services offered by financial intermediaries such as non-banking finance companies, banks and financial institutions. This course will also focus on issues concerning the financial management of financial intermediaries.				*	*	*
	19260EH38	Management of Clinical and Super Specialty	To give the students an overall view of the international financial system – instruments and markets.				*	*	*
	19260EH39	Services in Hospitals	To provide the basics of insurance contracts and to explain the various types of insurance policies.				*	*	*

IV	19260EH42	Patient Care Management	Student will acquire Nuances involved in short term corporate financing, Good ethical practices				*	*	*
	19260EH43	Health Related Laws and Ethics	To enable the students to understand the principles, practices and application in Micro Finance.				*	*	*
	19260EH44	Medical Tourism	The Objective of the Course is to familiarize the learner with the importance, techniques and the procedures involved in the management of Hospital Waste.						
TOURISM									
2017		MBA							
Sem	Course Code	Title of the Course	COs	POS					
				PO1	PO2	PO3	PO4	PO5	PO6
III	19260EI33	Tourism Principles, Policies and Practices	To realize the potential of tourism industry in India. To understand the various elements of Tourism Management and familiarize with the Tourism policies in the national and international context.	*	*			*	
	19260EI34	Tourism Products of India	To give an in-depth knowledge of the functioning of derivative securities market.	*	*			*	
	19260EI35	Destination Planning and development		*	*			*	
	19260EI36	Travel agency and Tour operations	The objective of the course is to provide to the students a specialized knowledge of the techniques of evaluating proposed investments and to acquaint them with the problems encountered in the decisional process pertaining to capital investments of the project.				*	*	*

	19260EI37	Hospitality Management	This course provides an understanding of the following fund-based and fee-based financial services offered by financial intermediaries such as non-banking finance companies, banks and financial institutions. This course will also focus on issues concerning the financial management of financial intermediaries.				*	*	*
	19260EI38	Indian culture and Heritage	To give the students an overall view of the international financial system – instruments and markets.			*	*	*	
	19260EI39	Tourism Marketing	To provide the basics of insurance contracts and to explain the various types of insurance policies.				*	*	*
IV	19260EI42	Ecotourism	Student will acquire Nuances involved in short term corporate financing, Good ethical practices				*	*	*
	19260EI43	Event Management	To enable the students to understand the principles, practices and application in Micro Finance.				*	*	*
	19260EI44	E- Tourism	To equip the students with necessary strategic knowledge and skills received to evaluate discussions or capital restructuring, mergers and acquisitions.				*	*	*
AGRI BUSINESS MANAGEMENT									
2017		MBA							
Sem	Course Code	Title of the Course	COs	POS					
				PO1	PO2	PO3	PO4	PO5	PO6
III	19260EJ33	Agribusiness Environment and Policy	To realize the potential of tourism industry in India. To understand the various elements of Tourism Management and familiarize with the Tourism policies in the national and international context.				*	*	*
	19260EJ34	Agricultural Marketing Management	To give an in-depth knowledge of the functioning of derivative securities market.				*	*	*

	19260EJ35	Farm Business Management				*	*	*	
	19260EJ36	Management of Agribusiness Cooperatives	The objective of the course is to provide to the students a specialized knowledge of the techniques of evaluating proposed investments and to acquaint them with the problems encountered in the decisional process pertaining to capital investments of the project.				*	*	*
	19260EJ37	Food Retail Management	This course provides an understanding of the following fund-based and fee-based financial services offered by financial intermediaries such as non-banking finance companies, banks and financial institutions. This course will also focus on issues concerning the financial management of financial intermediaries.				*	*	*
	19260EJ38	Management of Agricultural Input Marketing	To give the students an overall view of the international financial system – instruments and markets.				*	*	*
	19260EJ39	Agri Supply Chain Management	To provide the basics of insurance contracts and to explain the various types of insurance policies.				*	*	*
	19260EJ42	Agriculture Economics	Student will acquire Nuances involved in short term corporate financing, Good ethical practices				*	*	*
IV	19260EJ43	Agricultural and Micro-Finance	To enable the students to understand the principles, practices and application in Micro Finance.						
	19260EJ44	New Trends and Development in Agri-Sector	To equip the students with necessary strategic knowledge and skills received to evaluate discussions or capital restructuring, mergers and acquisitions.				*	*	*