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THANJAVUR – 613 403 - TAMIL NADU

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

B.TECH (FT)-2017R

Course Code	Title of the Course	COs	POS										
			PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
17147S11	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.								✓	✓	✓		✓
17148S12	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.	✓	✓	✓									
17149S13	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.												
17149S14	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	✓	✓	✓									
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	✓	✓	✓		✓	✓						✓
17154S15	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.			✓	✓					✓			
17150L17	PROBLEM SOLVING AND PYTHON	Write, test, and debug simple Python programs.	✓											
		Implement Python programs with conditionals and loops.		✓	✓									

	PROGRAMMING LABORATORY	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.			✓									
17149L18	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.			✓	✓	✓							✓
171VEA19	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						✓	✓	✓				
17147S21	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.		✓		✓								
17149S23A	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..			✓	✓								
17153S25A	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.	✓	✓	✓									
17149S24A	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	✓						✓	✓	✓	✓		✓
17150S26A	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.		✓	✓									
17154L27	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.	✓	✓	✓	✓	✓		✓	✓				
17150L28A	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	✓	✓	✓	✓	✓			✓				
17148C31A	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.	✓	✓	✓	✓	✓	✓	✓				✓		
17150C32	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	✓	✓	✓	✓		✓	✓	✓					✓
17150C33	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	✓	✓	✓						✓			
17150C34	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	✓	✓	✓	✓	✓	✓			✓		✓	✓
17150C35	COMMUNICATION ENGINEERING	Apply analog and digital communication techniques	3		2	1								✓
		Use data and pulse communication techniques.		3							2			✓
		Analyze Source and Error control coding.		3							2			✓
		Ability to comprehend and appreciate the significance and role of this course in the present contemporary world			3									✓
17150L36	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	✓	✓	✓	✓	✓								
17150L37	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.		✓	✓		✓								
17150L38	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			✓										
17150L39	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									✓	✓		✓	
17148S41A	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		✓	✓									
17150C42	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	✓	✓	✓	✓								
17150C43	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	✓	✓	✓	✓	✓	✓							
17150C44	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.		✓	✓		✓	✓							
17150C45	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.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
17150C46	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.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
17150L47	DATABASE MANAGEMENT SYSTEMS LABORATORY	Use typical data definitions and manipulation commands	✓	✓	✓						✓	✓	✓	✓		
		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	✓	✓	✓						✓	✓	✓	✓		
17150L48	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	✓	✓	✓		✓			✓	✓	✓		✓		
17150L49	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.	✓					✓	✓	✓	✓	✓		✓
17150CRS	RESEARCH LED SEMINAR	Exposure to various research domains	✓	✓	✓	✓	✓							✓
		Acquaintance with languages of research	✓	✓	✓	✓								✓
		Development of research aptitude			✓	✓	✓							✓
17148S51A	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.	✓	✓	✓	✓	✓	✓						
17150C52	COMPUTER NETWORKS	Understand the basic layers and its functions in computer 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.	✓	✓	✓	✓								
17150C53	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.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
17150C55	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.	✓	✓	✓	✓		✓		✓			✓	✓
17150C56	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	✓	✓	✓	✓	✓		✓	✓					✓
17150CRM	Research methodology	Understanding research questions and tools	✓	✓		✓									
		Experience in scientific writings	✓	✓	✓	✓									
		Practice in various aspects of scientific publications	✓	✓	✓	✓									
		Inculcation of research ethics	✓	✓	✓	✓				✓					
17150L57	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									✓				
17150L58	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		✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	

17150L59	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.	✓		✓	✓		✓	✓		✓	✓	✓	✓	✓
17150C61	INTERNET PROGRAMMING	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	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
17150C62	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.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
17150C63	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	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
17150C64	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.	✓	✓	✓	✓	✓			✓	✓	✓	✓	✓	
17150C65	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		✓	✓	✓	✓	✓							
17150L61	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.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
17150L62	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.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
17150L63	MINI PROJECT	take up any challenging practical problems and find solution by formulating proper methodology	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
		apply the knowledge of all related courses in providing hardware/software solutions	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
17150L64	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	✓		✓			✓	✓	✓	✓	✓	✓	✓	✓	✓
17150CBR	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	✓	✓	✓	✓	✓									
17150C71	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												
17150C72	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	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
17150C73	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.	✓	✓	✓	✓	✓	✓			✓			✓
		Evaluate and choose the appropriate technologies, algorithms and approaches for implementation and use of cloud.	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓

17150L77	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.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
17150L78	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	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
17150P83	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.							✓	✓	✓	✓	✓	✓
17150E66A	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	✓	✓	✓	✓	✓			✓	✓	✓	✓	✓
17150E66B	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.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
17150E66C	EMBEDDED SYSTEMS	Describe the architecture and programming of ARM 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	✓	✓	✓	✓	✓	✓	✓						
17150E66D	AGILE METHODOLOGIES	Realize the importance of interacting with business stakeholders in determining the requirements for a software system	✓	✓	✓				✓			✓		✓
		Perform iterative software development processes: how to plan them, how to execute them.	✓	✓	✓				✓					✓
		Point out the impact of social aspects on software development success.	✓	✓	✓		✓				✓			✓
		Develop techniques and tools for improving team collaboration and software quality.	✓	✓	✓	✓	✓			✓	✓		✓	✓
		Perform Software process improvement as an ongoing task for development teams.	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓
		Show how agile approaches can be scaled up to the enterprise level.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
17150E66E	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.	✓	✓	✓	✓	✓				✓			
17150E66F	DIGITAL SIGNAL PROCESSING	Perform mathematical operations on signals.	✓	✓	✓	✓								

		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.	✓	✓	✓	✓	✓	✓						
17150E66G	INTELLECTUAL PROPERTY RIGHTS	Ability to manage Intellectual Property portfolio to enhance the value of the firm	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
17150E75A	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.	✓	✓	✓	✓	✓					✓		✓
17150E75B	MACHINE LEARNING TECHNIQUES	Differentiate between supervised, unsupervised, semi-supervised machine learning approaches	✓	✓	✓									

		Discuss the decision tree algorithm and indentity 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	✓	✓	✓	✓	✓							
17150E75C	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	✓	✓	✓	✓	✓				✓	✓		
17150E75D	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	✓	✓	✓	✓	✓							
17150E75E	INTERNET OF THINGS	Explain the concept of IoT.	✓	✓	✓									
		Analyze various protocols for IoT.	✓	✓	✓	✓	✓							✓
		Design a PoC of an IoT system using Rasperry Pi/Arduino	✓	✓	✓			✓		✓		✓		✓
		Apply data analytics and use cloud offerings related to IoT.	✓	✓	✓	✓								
		Analyze applications of IoT in real time scenario	✓	✓	✓	✓	✓							
17150E75F	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												
17150E75G	TOTAL QUALITY MANAGEMENT	The student would be able to apply the tools and techniques of quality management to manufacturing and services processes.	✓					✓	✓	✓	✓	✓	✓	✓
17150E76A	MULTI-CORE ARCHITECTURES AND PROGRAMMING	Describe multicore architectures and identify their 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.	✓	✓		✓	✓	✓			✓			✓
17150E76B	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/ ecommerce/ e-learning Web sites.	✓	✓	✓	✓	✓				✓			✓
		Develop meaningful user interface.	✓		✓	✓	✓							

17150E76C	C# AND .NET PROGRAMMING	Write various applications using C# Language in the .NET Framework.	✓											
		Develop distributed applications using .NET Framework.	✓	✓	✓		✓							
		Create mobile applications using .NET compact Framework.	✓	✓	✓	✓	✓	✓		✓				
17150E76D	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	✓	✓	✓							✓	✓	
17150E76E	ADVANCED TOPICS ON DATABASES	To develop in-depth understanding of relational databases and skills to optimize database performance in practice.	✓	✓	✓	✓								
		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	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓
17150E76F	FOUNDATION SKILLS IN INTEGRATED PRODUCT DEVELOPMENT	Define, formulate and analyze a problem	✓	✓	✓									
		Solve specific problems independently or as part of a team	✓	✓	✓	✓								✓
		Gain knowledge of the Innovation & Product	✓	✓	✓	✓							✓	✓

		Development process in the Business Context													
		Work independently as well as in teams	✓	✓	✓	✓	✓				✓		✓	✓
		Manage a project from start to finish	✓	✓	✓		✓	✓	✓		✓			✓
17150E76G	HUMAN RIGHTS	Engineering students will acquire the basic knowledge of human rights.	✓	✓				✓	✓	✓	✓	✓		✓
17150E76H	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.	✓					✓	✓	✓	✓	✓	✓	✓
17150E81A	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.	✓	✓	✓	✓	✓	✓	✓		✓	✓		✓
17150E81B	SOCIAL NETWORK ANALYSIS	Represent knowledge using ontology.	✓	✓	□	✓	□	✓	□	✓	✓	□	□	□
		Develop semantic web related applications.	✓	□	✓	✓	✓	✓	✓	✓	□	✓	✓	✓

		Predict human behaviour in social web and related communities	✓	✓	✓	✓	✓	✓	✓		✓	✓		✓
		Visualize social networks	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
17150E81C	INFORMATION SECURITY	Discuss the basics of 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.	✓	✓	✓	✓	✓				✓	✓	✓	✓
17150E81D	SOFTWARE DEFINED NETWORKS	Analyze the evolution of software defined networks	✓	✓	✓									
		Express the various components of SDN and their uses	✓	✓	✓		✓	✓		✓			✓	✓
		Explain the use of SDN in the current networking scenario	✓	✓	✓	✓	✓			✓	✓	✓	✓	✓
		Design and develop various applications of SDN	✓	✓	✓	✓	✓	✓			✓		✓	✓
17150E81E	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.	✓	✓	✓		✓	✓		✓		✓		✓
17150E81F	SOFT COMPUTING	Apply suitable soft computing techniques for various applications	✓		✓	✓	✓		✓					
		Integrate various soft computing techniques for complex problems	✓	✓	✓	✓	✓	✓			✓	✓		
17150E81G	PROFESSIONAL ETHICS IN ENGINEERING	To apply ethics in society, discuss the ethical issues related to engineering and realize the responsibilities and rights in the society	✓					✓	✓	✓	✓	✓		✓
17150E82A	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.	✓	✓	✓	✓	✓							
17150E82B	GREEN COMPUTING	Acquire knowledge to adopt green computing practices to minimize negative impacts on the environment.	✓											
		Enhance the skill in energy saving practices in their use of hardware	✓	✓	✓		✓							✓
		Evaluate technology tools that can reduce paper waste and carbon footprint by the stakeholders.	✓	✓	✓	✓	✓		✓	✓	✓	✓		

		Understand the ways to minimize equipment disposal requirements	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
17150E82C	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	✓	✓	✓	✓	✓	✓		✓	✓			✓
17150E82D	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	✓	✓			✓							✓
17150E82E	PARALLEL ALGORITHMS	Develop parallel algorithms for standard problems and applications.	✓	✓	✓	✓								

		Analyse efficiency of different parallel algorithms	✓	✓	✓	✓	✓				✓				
17150E82F	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	✓	✓	✓	✓				✓					✓
17150E82G	FUNDAMENTALS OF NANO SCIENCE	Familiarize about the science of nano materials	✓					✓							
		Demonstrate the preparation of nano materials	✓	✓		✓	✓	✓	✓		✓				
		Develop knowledge in characteristic nano material	✓	✓	✓	✓	✓	✓	✓		✓				✓
1710P83	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									✓	✓			✓
17150FE54A	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.	✓	✓	✓		✓								✓
17150FE54 B	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	✓	✓	✓	✓	✓				✓				✓
17152FE54 A	BASICS OF BIO MEDICAL INSTRUMENTATIO N	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 physiogical measurements	✓	✓	✓	✓	✓	✓							✓

		Understand the different biochemical measurements	✓	✓	✓	✓						✓	✓	✓
17152FE54 B	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	✓	✓	✓	✓	✓							
17153FE54 A	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	✓	✓	✓	✓	✓				✓			✓
17153FE54 B	ENERGY CONSERVATION AND MANAGEMENT	To analyse the energy data of industries.	✓											✓
		Can carryout energy accounting and balancing	✓	✓	✓	✓		✓	✓		✓	✓		✓
		Can suggest methodologies for energy savings	✓	✓	✓	✓	✓	✓	✓	✓	✓		1	✓
17154FE54 A	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.	✓	✓	✓				✓		✓	✓	✓		✓
17154FE54 B	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.	✓	✓	✓	✓	✓		✓	✓		✓			✓
17155FE54 A	AIR POLLUTION AND CONTROL ENGINEERING	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.		✓	✓		✓	✓			✓				
		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	✓	✓	✓				✓			✓			✓
17152FE74A	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	✓	✓	✓	✓									
17152FE74B	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.	✓	✓	✓										
17153FE74A	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	✓	✓	✓	✓								
17153FE74B	INTRODUCTION TO RENEWABLE ENERGY SYSTEM	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.	✓	✓	✓	✓								
17154FE74A	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.						✓	✓	✓				

17154FE74 B	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									
17155FE74 A	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.	✓	✓	✓	✓			✓					
17155FE74 B	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 design and assess building	✓	✓	✓									
17150FE74A	INTRODUCTION TO C PROGRAMMING	Develop simple applications using basic constructs	✓	✓	✓									
		Develop applications using arrays and strings	✓	✓	✓	✓			✓		✓			✓
		Develop applications using functions and structures	✓	✓	✓	✓	✓			✓		✓	✓	✓

17150FE74B	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.	✓	✓	✓	✓	✓	✓				✓		✓

HOD

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COMPUTER SCIENCE AND ENGINEERING

B.TECH (PT)- 2017R

Mapping of COs and POs

Course Code	Title of the Course	Course Objectives	POS											
			PO1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2
17148S11P	Transforms and Partial Differential Equations	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	✓	✓	✓	✓								
17152S12P	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	✓	✓	✓	✓	✓							
17150H13P	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	✓	✓	✓	✓								
17150H14P	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.	✓	✓	✓	✓	✓	✓					✓	✓
17150H15P	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	✓	✓	✓						✓		✓	✓
17150H21P	Numerical Methods	Determine the solution of algebraic and transcentendal system of linear equations	✓	✓										
		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	✓	✓	✓	✓								
17150H22P	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.	✓	✓	✓	✓	✓							✓
17150H23P		Classify the modern and futuristic database applications based on size and complexity	✓	✓	✓									

	Database Management Systems	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.	✓	✓	✓	✓	✓							✓
17150H24P	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	✓	✓	✓	✓								✓
17150H25P	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	✓	✓	✓	✓	✓							
17148S31P	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.	✓	✓	✓									✓

17150H32P	Operating System	Analyze various scheduling algorithms.	✓	✓	✓										
		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	✓	✓	✓	✓	✓	✓							✓
17150H33P	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.	✓	✓	✓	✓	✓								✓
17150H34P	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	✓	✓	✓	✓	✓				✓				✓
17150L35P	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	✓	✓	✓	✓	✓		✓		✓			✓
17150H41P	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	✓	✓	✓	✓	✓	✓						✓
17150H42P	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.	✓	✓	✓	✓	✓				✓		✓	✓
17150H43P	C# And .Net Framework	Write various applications using C# Language in the .NET Framework.	✓	✓	✓									✓
		Create mobile applications using .NET compact Framework.	✓	✓	✓	✓	✓				✓			✓
		Develop distributed applications using .NET Framework	✓	✓	✓	✓	✓				✓			✓
17150E44AP	Theory of Computation	Design Finite State Machine, Pushdown Automata, and Turing Machine.	✓	✓	✓	✓								

		Explain the Decidability or Undecidability of various problems	✓	✓	✓	✓	✓							
17150E44BP	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	✓	✓	✓	✓	✓	✓						✓
17150E44CP	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	✓	✓	✓	✓	✓	✓						✓
17150E44DP	Advanced Databases	design a database using ER diagrams and map ER intoRelations 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.	✓	✓	✓	✓	✓	✓						
17150L45P	Internet Programming Lab	Create 3D graphical scenes using open graphics library suits	✓	✓	✓									✓
		Implement image manipulation and enhancement	✓	✓	✓	✓	✓				✓			✓
		Create 2D animations using tools	✓	✓	✓	✓	✓				✓		✓	✓
17150H51P	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.	✓	✓	✓	✓	✓				✓		✓	✓
17150H52P	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.	✓	✓	✓	✓	✓				✓		✓	✓
17150H53P	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.	✓	✓	✓	✓	✓							✓
17150E54AP	Soft Computing	Apply suitable soft computing techniques for various applications.	✓	✓	✓									
		Integrate various soft computing techniques for complex problems.	✓	✓	✓									
17150E54BP	Principles of Compiler Design	Design and implement a prototype compiler.	✓	✓	✓									
		Apply the various optimization techniques.	✓	✓	✓									
		Use the different compiler construction tools.	✓	✓	✓	✓	✓							
17150E54CP	Distributed Systems	Discuss trends in Distributed Systems.	✓	✓	✓									
		Apply network virtualization.	✓	✓	✓	✓	✓							
		Apply remote method invocation and objects	✓	✓	✓	✓	✓				✓		✓	✓
		Design process and resource management systems.	✓	✓	✓	✓	✓				✓		✓	✓

17150E54DP	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.	✓	✓	✓	✓	✓							✓
17150L55P	Software Development Lab	Design and Implement various mobile applications using emulators.	✓	✓	✓								✓	✓
		Deploy applications to hand-held devices	✓	✓	✓	✓	✓				✓	✓	✓	✓
17150H61P	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	✓	✓	✓	✓	✓							
17150H62P	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	✓	✓	✓	✓	✓							
17150H63P	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.	✓	✓	✓	✓	✓				✓		✓	✓
17160E64AP	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	✓	✓	✓			✓	✓	✓	✓	✓	✓	✓
17150E64BP	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	✓	✓	✓	✓	✓	✓			✓		✓	✓
17150E64CP	Parallel Computing	optimize sequential code for fastest possible execution	✓	✓	✓	✓	✓	✓					✓	✓
		Develop, analyze and implement algorithms for parallel computers	✓	✓	✓	✓	✓				✓		✓	✓
17150E64DP	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	✓	✓	✓	✓	✓			✓			✓	✓
17150L65P	Java Programming Lab	Create 3D graphical scenes using open graphics library suits	✓	✓	✓	✓	✓							
		Implement image manipulation and enhancement	✓	✓	✓	✓	✓							✓
		Create 2D animations using tools	✓	✓	✓	✓	✓							✓
17160S71P	Total Quality Management	The student would be able to apply the tools and techniques of quality management to manufacturing and services processes.	✓	✓	✓			✓	✓	✓	✓	✓	✓	✓

17150H72P	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.	✓	✓	✓	✓	✓				✓	✓		✓
17150H73P	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	✓	✓	✓	✓	✓							✓
17150E74AP	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	✓	✓	✓	✓	✓				✓		✓	✓
17150E74BP	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	✓	✓	✓	✓	✓	✓			✓		✓	✓
17150E74CP	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.	✓	✓	✓	✓	✓				✓		✓	✓

17150E74DP	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	✓	✓	✓	✓	✓							✓
17150P75P	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	✓	✓	✓	✓	✓	✓			✓		✓	✓

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COMPUTER SCIENCE AND ENGINEERING

M.TECH (FT)- 2017R

Mapping of COs and POs

Course Code	Title of the Course	Course Objectives	POS									
			PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
17248S11A	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	✓	✓		✓	✓	✓	✓	✓		
17250H12	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.	✓	✓	✓	✓		✓		✓	✓	
17250H13	Parallel and High Performance Computing	To understand the models and parameters used.	✓		✓	✓	✓				✓	
		To understand the Matrix Algorithms and Design Issues		✓	✓	✓		✓	✓			✓
17250H14	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		✓	✓		✓		✓	✓		
17250H15	Advanced Data Structures and Algorithms	The Different Heap Structures, Search Structures and Multimedia Structures.	✓	✓			✓			✓		✓
		The various coding scheduling and algorithms.	✓	✓	✓		✓					
		The various multimedia structures.	✓	✓	✓	✓	✓	✓	✓		✓	✓
17250E16A	Multimedia Systems	To study the graphics techniques and algorithms.	✓	✓	✓		✓					
		To study the multimedia concepts and various I/O technologies	✓			✓	✓		✓		✓	✓
17250E16B	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.					✓	✓			✓	✓
17250E16C	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	✓	✓			✓		✓			✓
17250L17	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	✓	✓	✓	✓	✓	✓	✓			
17250CRS	Research Led Seminar	Exposure to various research domains	✓	✓	✓		✓	✓		✓	✓	
		Acquaintance with languages of research	✓	✓	✓	✓		✓		✓		✓
		Development of research aptitude	✓	✓		✓						✓
17250H21	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.	✓	✓		✓	✓	✓		✓	✓	
17250H22	Object Oriented Software Engineering	To learn about software prototyping, analysis and design.	✓	✓		✓	✓			✓	✓	
		To learn UML and its usage.	✓	✓	✓	✓		✓		✓		
		Case studies to apply the principles										

17250H23	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										
17250E24A	Advanced Distributed Computing	processing, distributed systems, operating system issues.	✓	✓		✓		✓				
		learn about distributed transaction	✓	✓	✓		✓	✓	✓			
		study about the distributed databases	✓	✓	✓	✓						
17250E24B	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			✓	✓						
17250E24C	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										
17250E25A	Service Oriented Architecture	Understand SOA, service orientation and web services	✓	✓	✓							
		Analyzing and designing business based on SOA principles.			✓	✓						
		Learning the concepts of XML				✓	✓	✓				
17250E25B	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				✓	✓	✓		✓		
17250E25C	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 – IIRTOS			✓	✓	✓	✓				
17250L26	.NET Technologies Lab	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.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
172TECWR	Technical Writing /Seminars	take up any challenging practical problems and find solution by formulating proper methodology	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
		apply the knowledge of all related courses in providing hardware/software solutions	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
17250CRM	Research Methodology	Understanding research questions and tools	✓	✓	✓	✓	✓		✓			
		Experience in scientific writings	✓	✓	✓	✓	✓	✓	✓			
		Practice in various aspects of scientific publications	✓	✓	✓			✓	✓			
		Inculcation of research ethics	✓	✓		✓	✓			✓	✓	✓
17250CBR	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	✓	✓	✓	✓	✓					
17250H31	Software Project Management	Understand Project planning and management.	✓	✓								
		Identify Client management and project definition.		✓	✓							
		Understand testing based approach to development.				✓	✓					
17250E32A	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				✓	✓	✓				
17250E32B	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.				✓	✓					
17250E32C	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			✓	✓	✓					
17250E33A	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			✓	✓	✓					
17250E33B	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				✓	✓					
17250E33C	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										

17250E34A	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					✓					
17250E34B	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							✓	✓		
17250E34C	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 applicaitions					✓					
17250P35	Project Work- Phase I	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									✓	✓
17250P35	Project Work- Phase I	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							✓	✓	✓	✓
17250CSR	Design/Socio Technical Project	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								✓		✓
17250P41	Project Work- Phase II	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									✓	✓

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COMPUTER SCIENCE AND ENGINEERING

M.TECH (PT)- 2017R

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
17248S11AP	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		✓		✓	✓	✓	✓	✓				
17250H12P	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		✓	✓		✓		✓	✓				
17250H13P	Advanced Data Structures and Algorithms	The Different Heap Structures, Search Structures and Multimedia Structures.	✓	✓			✓			✓		✓		
		The various coding scheduling and algorithms.	✓	✓	✓		✓							
		The various multimedia structures.	✓	✓	✓	✓	✓	✓	✓		✓	✓		
17250L14P	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												
17250HRSP	Research Led Seminar	Exposure to various research domains	✓	✓	✓		✓	✓		✓	✓			✓
		Acquaintance with languages of research	✓	✓	✓	✓		✓		✓		✓	✓	✓
		Development of research aptitude	✓	✓		✓						✓	✓	✓
17250H21P	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.	✓	✓		✓	✓	✓		✓	✓			
17250H22P	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												
17250E23AP	Advanced Distributed Computing	processing, distributed systems, operating system issues.	✓	✓		✓		✓						
		learn about distributed transaction	✓	✓	✓		✓	✓	✓					
		study about the distributed databases	✓	✓	✓	✓								
17250E23BP	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			✓	✓								
17250E23 CP	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			✓	✓	✓							
17250L24P	.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	✓	✓	✓	✓	✓				✓	✓	✓	✓
172TECW RP	Technical Writing /Seminars	Understand professional writing by studying management communication	✓	✓	✓	✓	✓				✓	✓	✓	✓
17250CRM P	Research Methodology	Understanding research questions and tools	✓	✓	✓	✓	✓		✓					
		Experience in scientific writings	✓	✓	✓	✓	✓	✓	✓					
		Practice in various aspects of scientific publications	✓	✓	✓			✓	✓					
		Inculcation of research ethics	✓	✓		✓	✓			✓		✓		
17250CBR P	Participation in Bounded Research	Knowledge and awareness of basic principles and concepts of biology, computer science and mathematics	✓	✓	✓	✓			✓	✓	✓	✓		
17250H31P	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.	✓	✓	✓	✓		✓		✓	✓			
17250E32P	Parallel and High Performance Computing	To understand the models and parameters used.	✓		✓	✓	✓				✓			
		To understand the Matrix Algorithms and Design Issues		✓	✓	✓		✓	✓			✓		
17250E33AP	Multimedia Systems	To study the graphics techniques and algorithms.	✓	✓	✓		✓							
		To study the multimedia concepts and various I/O technologies				✓	✓		✓		✓	✓		
17250E33BP	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.					✓	✓			✓	✓		
17250E33CP	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	✓	✓			✓		✓			✓		
17250CSRP	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	✓			✓			✓	✓			✓	
17250H41P	Object Oriented Software Engineering	To learn about software prototyping, analysis and design.	✓	✓		✓	✓			✓		✓		
		To learn UML and its usage.	✓	✓	✓	✓		✓		✓				
		Case studies to apply the principles												
17250H42P	Software Project Management	Understand Project planning and management.	✓	✓										
		Identify Client management and project definition.		✓	✓									

		Understand testing based approach to development.				✓	✓							
17250E43 AP	Service Oriented Architecture	Understand SOA, service orientation and web services	✓	✓	✓									
		Analyzing and designing business based on SOA principles.			✓	✓								
		Learning the concepts of XML				✓	✓	✓						
17250E43 BP	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				✓	✓	✓		✓				
17250E43 CP	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 – IIRTOS			✓	✓	✓	✓						
17250P44P	Project Work-Phase I	To independently carry out research /investigation to identify and solve practical problems	✓				✓			✓				✓
		To write and present a report												
17250E51 AP	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				✓	✓	✓						
17250E51 BP	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.				✓	✓							
17250E51 CP	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			✓	✓	✓							
17250E52 AP	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			✓	✓	✓							
17250E52 BP	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				✓	✓							
17250E52 CP	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												
17250E53 AP	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					✓							
17250E53 BP	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							✓	✓				
17250E53 CP	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 applicaitions					✓							
17250P61P	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.												

HOD

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