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UNIVERSITY
NAAC ACCREDITED
THANJAVUR – 613 403 - TAMIL NADU

Dept: COMPUTER SCIENCE AND ENGINEERING

BTECH (FT)- 2020R

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
20147S11	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.								✓	✓	✓		✓
20148S12	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.	✓	✓	✓									
20149S13	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.	✓	✓	✓									
20149S14	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	✓	✓	✓									
20150S16	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	✓	✓	✓		✓	✓						✓
20154S15	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.			✓	✓					✓			
20150L17	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.			✓									
20149L18	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.			✓	✓	✓							✓
191VEA19	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						✓	✓	✓				
20147S21	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.								✓	✓	✓		✓
20148S22A	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.		✓		✓								

20149S23A	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..			✓	✓								
20153S25A	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.	✓	✓	✓									

20149S24A	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							✓	✓	✓	✓		✓
20150S26A	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.		✓	✓									
20154L27	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.	✓	✓	✓	✓	✓		✓	✓				
20150L28A	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	✓	✓	✓	✓	✓			✓				
20148C31A	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.	✓	✓	✓	✓	✓	✓	✓				✓	
20150C32	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	✓	✓	✓	✓		✓	✓	✓				✓	
20150C33	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	✓	✓	✓						✓				
20150C34	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	✓	✓	✓	✓	✓	✓			✓		✓	✓	
20150C35	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												
20150L36	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	✓	✓	✓	✓	✓							
20150L37	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.		✓	✓		✓							

20150L38	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			✓									
20150L39	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									✓	✓		✓
20148S41A	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		✓	✓									
20150C42	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	✓	✓	✓	✓								
20150C43	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	✓	✓	✓	✓	✓	✓						
20150C44	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.		✓	✓		✓	✓						
20150C45	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.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

20150C46	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.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
20150L47	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	✓	✓	✓						✓	✓	✓	✓
	OPERATING SYSTEMS LABORATORY	Compare the performance of various CPU Scheduling Algorithms	✓	✓	✓		✓			✓	✓	✓		✓

20150L48		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	✓	✓	✓		✓			✓	✓	✓		✓
20150L49	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.	✓					✓	✓	✓	✓	✓		✓
201AGCE	COMMUNITY ENGAGEMENT	Exposure to various research domains	✓	✓	✓	✓	✓							✓
		Acquaintance with languages of research	✓	✓	✓	✓								✓
		Development of research aptitude			✓	✓	✓							✓
20148S51A	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.		✓	✓	✓	✓	✓						
20150C52	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.	✓	✓	✓	✓								
20150C53	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.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
20150C55	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.	✓	✓	✓	✓		✓		✓			✓	✓
20150C56	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	✓	✓	✓	✓	✓		✓	✓				✓
201AGIE	INNOVATION AND ENTREPRENEURSHIP	Understanding research questions and tools	✓	✓		✓								
		Experience in scientific writings	✓	✓	✓	✓								
		Practice in various aspects of scientific publications	✓	✓	✓	✓								
		Inculcation of research ethics	✓	✓	✓	✓				✓				
20150L57	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	✓					✓		✓			✓	
20150L58	OBJECT ORIENTED	Perform OO analysis and design for a given problem specification.	✓	✓	✓	✓					✓			

	ANALYSIS AND DESIGN LABORATORY	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		✓	✓	✓	✓	✓	✓		✓	✓	✓	✓
20150L59	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.	✓		✓	✓		✓	✓		✓	✓	✓	✓
201AGIE	INNOVATION AND ENTREPRENEURSHIP	Take up any challenging practical problems and find solution by formulating proper methodology	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
20150C61	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	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
20150C62	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.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
20150C63	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	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
20150C64	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.	✓	✓	✓	✓	✓			✓	✓	✓	✓	✓
20150C65	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		✓	✓	✓	✓	✓						
20150L61	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.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
20150L62	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.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
20150L63	MINI PROJECT	apply the knowledge of all related courses in providing hardware/software solutions	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
20150L64	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	✓		✓			✓	✓	✓	✓	✓	✓	✓	✓
201ASTT	TECHNICAL TRAINING	Hands on exposure to problem solving tools in contemporary research	✓	✓	✓	✓									
		Evolution of research intuitiveness and orientation	✓	✓	✓	✓									
		Familiarity with cutting edge research trends	✓	✓	✓	✓	✓								
20150C71	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	✓	✓				✓	✓	✓	✓	✓	✓	✓
20150C72	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	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
20150C73	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.	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓
20150L77	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.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

20150L78	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	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
20150P83	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.							✓	✓	✓	✓	✓	✓
201AGPE	PROFESSIONAL ETHICS AND HUMAN VALUE	Identify the problem by applying acquired knowledge	✓	✓		✓			✓	✓	✓			
		Analyze and categorize executable project modules after considering risks		✓	✓	✓	✓	✓	✓	✓	✓	✓		✓

20150E66A	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	✓	✓	✓	✓	✓			✓	✓	✓	✓	✓	
20150E66B	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.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
20150E66C	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	✓	✓	✓	✓	✓				✓	✓		
20150E66D	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.	✓	✓	✓	✓	✓				✓			
20150E75A	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.	✓	✓	✓	✓	✓					✓		✓
20150E75B	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	✓	✓	✓	✓	✓							
20150E75C	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	✓	✓	✓	✓	✓							
20150E75D	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	✓	✓		✓	✓					✓		✓
20150E76A	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	✓	✓	✓	✓	✓							
20150E76B	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.	✓	✓		✓	✓	✓			✓			✓
20150E76C	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.	✓		✓	✓	✓							
20150E76D	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	✓	✓	✓							✓	✓	
20150E81A	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.	✓	✓	✓	✓	✓	✓	✓		✓	✓		✓
		Represent knowledge using ontology.	✓		✓			✓	✓	✓	✓			

20150E81B	SOCIAL NETWORK ANALYSIS	Develop semantic web related applications.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
		Predict human behaviour in social web and related communities	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	
		Visualize social networks	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	
20150E81C	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.	✓	✓	✓	✓	✓				✓	✓	✓	✓	
20150E81D	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.	✓	✓	✓		✓	✓		✓	✓	✓		✓	

20150E82A	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.	✓	✓	✓	✓	✓							
20150E82CB	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	✓	✓	✓	✓	✓	✓		✓	✓			✓
20150E82C	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	✓	✓			✓							✓
20150E82D	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	✓	✓	✓	✓				✓				✓
20150FE54A	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.	✓	✓	✓		✓							✓
20150FE54B	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	✓	✓	✓	✓	✓				✓			✓
20152FE54A	BASICS OF BIO MEDICAL INSTRUMENTATION	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	✓	✓	✓	✓						✓	✓	✓
20152FE54 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	✓	✓	✓	✓	✓							
20153FE54 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	✓	✓	✓	✓	✓				✓			✓

20153FE54 B	ENERGY CONSERVATION AND MANAGEMENT	To analyse the energy data of industries.	✓											✓
		Can carryout energy accounting and balancing	✓	✓	✓	✓		✓	✓		✓	✓		✓
		Can suggest methodologies for energy savings	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓
20154FE54 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.	✓	✓	✓				✓		✓	✓	✓	✓
20154FE54 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.	✓	✓	✓	✓	✓		✓	✓		✓		✓
20155FE54 A		Basic concepts of air quality management.	✓											

	AIR POLLUTION AND CONTROL 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.		✓	✓		✓	✓			✓			
20155FE54B	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	✓	✓	✓				✓			✓		✓
20152FE74A	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	✓	✓	✓	✓								
20152FE74B	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.	✓	✓	✓									
			✓	✓	✓	✓								
20153FE74A	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	✓	✓	✓	✓								

20153FE74B	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.	✓	✓	✓	✓								
20154FE74A	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.						✓	✓	✓				
20154FE74 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									
20155FE74 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.	✓	✓	✓	✓			✓					

20155FE74 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 suggest materials and technologies to improve energy efficiency of building.	✓	✓			✓	✓	✓	✓				
		Students should be able to design and assess building	✓	✓	3									
20150FE74 A	INTRODUCTION TO C PROGRAMMING	Develop simple applications using basic constructs	✓	✓	✓									
		Develop applications using arrays and strings	✓	✓	✓	✓			✓		✓			✓
		Develop applications using functions and structures	✓	✓	✓	✓	✓			✓		✓	✓	✓
20150FE74 B	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.	✓	✓	✓	✓	✓	✓				✓		✓

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