

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

(R13 REGULATION COURSE OUTCOMES)

COURSE CODE & NAME	CO	CO STATEMENT
SEMESTER-1(I-I)		
C101 English-1	C101.1	Acquired listening, speaking, reading and writing skills necessary for the survival in the post modern society through task-based and skill-based communication practices with judicious integration of modern tools.
	C101.2	Realisation of technical communicative competence and attainment of group dynamism and problem solving skills through standard oral and written language models.
	C101.3	Development of fluency and accuracy for effective and professional communication in real-time situations by using appropriate verbiage and contextual knowledge.
	C101.4	Imbided lifelong reading habit among the learners to grow both professionally and socially with ethical principles and values.
	C101.5	Application of own ideas as informed opinions that are in dialogue with a larger community of interpreters, and understand how their own approach compares to the variety of critical and theoretical approaches.
	C101.6	Demonstration of intercultural competence, knowledge of civic responsibility, and the ability to engage effectively in regional, national, and global communities.
C102 Mathematics-1	C102.1	Identify and solve the first order differential equations. Able to model the real world problems using differential equations and analyze their solutions
	C102.2	Solve the higher order linear differential equations and model the electrical circuits using differential equations.
	C102.3	Understand and determine Laplace and Inverse Laplace transform of certain functions and solve an initial value problem for a differential equation using Laplace transform.
	C102.4	Acquire knowledge on partial differentiation and calculate total derivative, Jacobian and Maxima and Minima of function of several variables.
	C102.5	Form a partial differential equation and solve first order linear and non-linear partial differential equations.
	C102.6	Solve higher order homogeneous partial differential equations using method of separation of variables and apply these techniques to solve heat equation and wave equation.
C103 Engineering Chemistry	C103.1	Understand the importance of water as an Engineering material apart from its domestic use& learns how to protect it in nature from various disturbances occurred in boilers.
	C103.2	Recognises the conversion of chemical energy to electrical energy &electrical energy to chemical energy in various electrical devices used in diff. Purposes.
	C103.3	Learns how the metals &its structures are getting destructed due to electrochemical reactions &identify its protective

		methods.
	C103.4	Understand the properties & the need of polymers in every section of the Society like Education, &IT Construction ,Transport, Agriculture etc.
	C103.5	Recognizes the Composition, Properties &the uses of various fuels for both domestic & industrial purpose economically, &The problems raised in Internal Combustion Engine.
	C103.6	Understand the diff. advanced materials &their applications in various fields of science and technology.
C104 Engineering Mechanics	C104.1	To find the resultant of any number of forces and can apply friction concept for a given body.
	C104.2	To draw free body diagram for a given body can calculate the forces in members of the truss.
	C104.3	To find the centroid and centre of gravity of composite sections.
	C104.4	To evaluate and find the moment of inertia of composite sections.
	C104.5	To analyze the motion of the bodies and the forces causing the motion.
	C104.6	To apply Work-Energy and Impulse-Momentum equations to find out the different parameters.
C105 Computer Programming	C105.1	Understand the basic terminology used in computer programming and Write, compile and debug programs in C language.
	C105.2	Analyze, design and develop programs involving decision structures, loops, arrays.
	C105.3	Analyze, design and develop programs involving modularization.
	C105.4	Developing the programs using dynamic memory concepts using pointers.
	C105.5	Design and develop programs using different user defined data types
	C105.6	Analyze ,Design and develop file handling programs
C106 Environmental Studies	C106.1	Understand about the environment its structure and components, along with the diff. ecosystems.
	C106.2	Understand about the natural resources, various impacts of over utilisation of it.
	C106.3	Ability to understand the biodiversity of India and identifies its threats and conservation practices to protect it
	C106.4	Acquire knowledge on environmental pollution and its effects on living and non living things along with its controlling &treatment methods.
	C106.5	Identify social issues both rural and urban environment and the possible means to applicant the environmental legislations of India towards sustainable development
	C106.6	Acquire the knowledge of various environmental assessment stages involved in EIA and environmental audit for the self sustaining and ecofriendly Environment.
C107 English Communication Skills Lab-1	C107.1	Enabling students to use Computer assisted Language Laboratory (CALL) to enhance their pronunciation through stress, intonation and rhythm for routine and spontaneous interaction

	C107.2	Attainment of communicative competence for the fulfilment of academic, professional and social purposes.
	C107.3	Attainment of language Proficiency through Contextualized, Task Based Activities to realize employment potential at the end of the course.
	C107.4	Acquired listening, speaking, reading and writing skills necessary for the survival in the post modern society through task-based and skill-based communication practices with judicious integration of modern tools.
	C107.5	Development of fluency and accuracy for effective and professional communication in real-time situations by using appropriate verbiage and contextual knowledge.
	C107.6	Realisation of technical communicative competence and attainment of group dynamism and problem solving skills through standard oral and written language models.
C108 Engineering Chemistry Laboratory	C108.1	Students have practical exposure on volumetric analysis
	C108.2	Students acquire the skill to perform the Acid-Base titration in the real lab.
	C108.3	Students acquire the skill to perform the Redox titrations of a sample in the real lab
	C108.4	Students acquire the skill to prepare standard solutions of Mohr's salt.
	C108.5	Students acquire the skill to perform the Iodometric titration in the real lab
	C108.6	Students acquire the skill to perform the quality of raw water in the real lab
	C108.7	Students acquire the skill to perform the Complex metric-titration in the real lab
	C108.8	Students would be aware of instrumental methods of chemical analysis
	C108.9	Students acquire the skill to determine the concentration of H ⁺ ions for a given water sample using. Ph Meter in the real lab.
	C108.10	Students would be aware of instrument like conductivity meter
	C108.11	Students would be aware of instrument like potential meter
	C108.12	Students acquire the skill to determine the Vitamin – C concentration using volumetric analysis
C109 Computer Programming Lab	C109 .1	Apply and practice logical ability to solve the problems.
	C109.2	Understand and use C programming development environment to develop C programs.
	C109 .3	Understand and apply the knowledge of arrays and strings
	C109 .4	Analyzing the complexity of problems, Modularize the problems into small modules and then convert them into programs.
	C109 .5	Understand and apply User defined data types, the pointers, memory allocation techniques and use of files for dealing with variety of problems.
SEMESTER-2(I-II)		
C110 English – II	C110.1	Acquired listening, speaking, reading and writing skills necessary for the survival in the post modern society through task-based and skill-based communication practices with

		judicious integration of modern tools.
	C110.2	Realisation of technical communicative competence and attainment of group dynamism and problem solving skills through standard oral and written language models.
	C110.3	Development of fluency and accuracy for effective and professional communication in real-time situations by using appropriate verbiage and contextual knowledge.
	C110.4	Imbibe lifelong reading habit among the learners to grow both professionally and socially with ethical principles and values.
	C110.5	Application of own ideas as informed opinions that are in dialogue with a larger community of interpreters, and understand how their own approach compares to the variety of critical and theoretical approaches.
	C110.6	Demonstration of intercultural competence, knowledge of civic responsibility, and the ability to engage effectively in regional, national, and global communities.
C111 Mathematics-II (MM)	C111.1	Understand the basic numerical methods and capable to solve and develop an algorithm for algebraic and transcendental equations.
	C111.2	Skill to Understand the interpolation methods and find the interpolation polynomials/values for the given data by the suitable interpolation method.
	C111.3	Able to apply numerical integration to evaluate definite integral and solving ordinary differential equations by using Taylor's series, Picard's method, Euler's method, Modified Euler's method and Runge-Kutta method.
	C111.4	Skill to find the Fourier series of different functions.
	C111.5	Understand the concept of Fourier transforms and find Fourier transforms for different functions.
	C111.6	Interpret to apply Z-transforms for the engineering problems like – properties – Damping rule – Shifting rule – Initial and final value theorems -Inverse z transform- -Convolution theorem – Solution of difference equation by Z -transforms
C112 Mathematics -III	C112. 1	Determine the rank of a matrix by reducing to echelon form, normal form & solve system of simultaneous linear equations and apply these methods to find the current in electrical circuits using matrices.
	C112.2	Solve the problems related to Eigen values & Eigen vectors of a given matrix, determine the inverse and powers of a matrix using Cayley – Hamilton theorem and identify the rank, nature and index of a Quadratic form.
	C112.3	Identify the given curve by interpreting different properties of the curve. Able to determine Double integral over a surface and triple integral over a volume and find the lengths, surface areas and volumes of solids using double and triple integrals
	C112.4	Understand Beta & Gamma functions and able to evaluate improper integrals using beta, gamma functions
	C112.5	Find the gradient of a scalar function, divergence & curl of a vector function and determine normal, flux and scalar potential using vector differentiation.
	C112.6	Determine line, surface and volume integrals and able to verify Green's, Stoke's and Gauss divergence theorems

C113 Engineering Physics	C113.1	Apply the basic principles and properties of light to construct and understanding the working mechanism of instruments such as Interferometer, Diffractometer and Polarimeter.
	C113.2	Describe the applications of lasers by utilizing its characteristic properties and principles.
	C113.3	Explore the applications of optical fiber
	C113.4	Discuss the propagation of EM fields in isotropic & dielectric medium by observing their response to different materials.
	C113.5	Classify the solid state materials based on the band theory by applying the principles of Quantum Mechanics & free electron theory.
	C113.6	Identify the given semiconductor by studying its charge carriers through the Hall effect.
C114 Professional Ethics and Human Values	C114 .1	Ensures engineers sustained happiness through identifying the essentials of human values and skills.
	C114 .2	Produce knowledge among students about relational ship Engineering and professional ethics
	C114 .3	Evaluate practically the importance of Engineering profession and enriching interaction with Engineer and society.
	C114 .4	Provide appropriate knowledge for the safety and health of employees.
	C114 .5	Harmony in professional and personal life.
	C114 .6	Guide Engineer as a global problem solver and sustain in the cross cultural environment
C115 Engineering Drawing	C115.1	Describe the construct polygons , curves and scales
	C115.2	Impart the significance of projection of points and lines
	C115.3	Understand to draw orthographic projections of lines inclined to both planes
	C115.4	Understand to draw the projection of planes
	C115.5	Understand to draw the projection of solids
	C115.6	Impart the visualization of 3D –objects and draw the orthographic, isometric views
C116 English - Communication Skills Lab -2	C116.1	Enabling students to use Computer assisted Language Laboratory (CALL) to enhance their pronunciation through stress, intonation and rhythm for routine and spontaneous interaction
	C116.2	Attainment of communicative competence for the fulfilment of academic, professional and social purposes.
	C116.3	Attainment of language Proficiency through Contextualized, Task Based Activities to realize employment potential at the end of the course.
	C116.4	Acquired listening, speaking, reading and writing skills necessary for the survival in the post modern society through task-based and skill-based communication practices with judicious integration of modern tools.
	C116.5	Development of fluency and accuracy for effective and professional communication in real-time situations by using appropriate verbiage and contextual knowledge.
	C116.6	Realisation of technical communicative competence and attainment of group dynamism and problem solving skills through standard oral and written language models.

C117 Engineering Workshop & IT Workshop	C117.1	Identify the working principles of acid-base, redox, and complex metric, conduct metric, potentiometric titrations.
	C117.2	Apply the working principles of acid-base, redo, complex metric, conduct metric, potentiometric titrations to perform the experiments using required apparatus.
	C117.3	Compute the required parameter by suitable formula using experimental values (observed values) of acid-base, redox, and complex metric, conduct metric, potentiometric titrations.
	C117.4	Analyze the experimental results through percentage of error.
	C117.5	Recognize the required precautions to carry out the experiment and handling the apparatus in the laboratory.
	C117.6	Demonstrate the working principles, procedures and applications in acid-base, redox, complex metric, and conduct metric, potentiometric titrations.
C118 Engineering Physics Laboratory	C118.1	Identify the working principles of laboratory experiments in optics, mechanics, electromagnetic and electronics.
	C118.2	Apply the working principles of laboratory experiments in optics, mechanics, electromagnetic and electronics and perform the experiments using required apparatus.
	C118.3	Compute the required parameter by suitable formula using experimental values (observed values) in mechanics, optics, electromagnetic and electronic experiments.
	C118.4	Analyze the experimental results through graphical interpretation.
	C118.5	Recognize the required precautions to carry out the experiment and handling the apparatus in the laboratory.
	C118.6	Demonstrate the working principles, procedures and applications.
SEMESTER-3(II-I)		
C201 Managerial Economics and Financial Analysis	C201.1	Analyze macro, micro economic concepts useful for business units and determine influences of demand analysis
	C201.2	Specifications of production functions , types of costs and solving engineering problems by applying knowledge of economics
	C201.3	Understand and analyze the market structure and setting prices for the products
	C201.4	Create awareness to start an enterprise in their own, analyze and investigate different stages of business cycle
	C201.5	Knowledge of preparation of accounts, financial statements and their analysis through ratios and solving problems.
	C201.6	Significant value with financing methods, their applicability in decision making and problem-solving skills according to new trends.
C202 Object Oriented Programming through C++	C202.1	Capability to acquire better to design and implementation of a program.
	C202.2	Acquires the basic knowledge in C++ programming, operators, control structures, functions, overloading, recursion.
	C202.3	Understanding the C++ concepts classes, objects and member functions, constructors, Destructors, variants in them, operator overloading, type conversions.
	C202.4	Gaining the knowledge on inheritance, types of inheritance,

		polymorphism, and virtual functions.
	C202.5	Analyze the templates, function templates for generic programming and understand the Exception handling mechanism for program recovery.
	C202.6	Understand the file system very effectively so that implement various operations on files
C203 Mathematical Foundations of Computer Science	C203.1	Understand the notions of propositions and analyzing the predicate formulae, and formal proofs along with their applications
	C203.2	Analyze and apply relations and functions concepts and distinguish different types of relations and functions.
	C203.3	Understand, Analyze and apply knowledge of number theory
	C203.4	Understand and apply counting techniques and combinatory and able to understand Algebraic Systems.
	C203.5	Understand and apply the knowledge of – solving the recurrence relations by using various methods.
	C203.6	Understand, Analyze and apply the knowledge of Graph theory in the field of Computer Science.
C204 Digital Logic Design	C204.1	Define different number systems, binary addition and subtraction, 2's complement representation and its operations.
	C204.2	Illustrate different switching algebra theorems and apply them for logic functions. Apply miniaturization techniques to simplify complex logic circuit.
	C204.3	Demonstrate and apply the function of combinational circuits: encoders/decoders, (de) multiplexers, exclusive ORs, comparators, arithmetic logic units and to be able to build simple applications.
	C204.4	Outline the function of bitable element and the different latches and flip-flops.
	C204.5	Model and construct different sequential circuits like different types of counters, shift registers and their applications in digital circuits.
	C204.6	Illustrate the working of PROM, PLA, and PAL and outline their applications.
C205 Data Structures	C205.1	Analyze different algorithms, searching and sorting techniques based on their complexity.
	C205.2	Acquire the knowledge on selection of data structure such as stacks and queues, to solve various computing problems.
	C205.3	Be familiar with implementing data structures using linked list.
	C205.4	Effectively choose the data structure like binary trees and binary search trees to solve storage problems.(Analyze)
	C205.5	Identify binary search trees to solve problems.
	C205.6	Efficiently know where to apply linear/non linear data structures like graphs.
C206 Object Oriented Programming Lab	C206.1	The understanding of computer programming concepts facilitates the better implementation of object oriented programming.
	C206.2	Acquires the basic knowledge in C++ programming, parameter passing mechanisms, function overloading, friend functions, exception handling and recursion.
	C206.3	Understanding the C++ concepts classes, objects and member

		functions, constructors, Destructors, variants in them, operator overloading, type conversions.
	C206.4	Real time applicability can be accomplished through inheritance and delegation.
	C206.5	Analyze the templates, function templates for generic programming and understand the Exception handling mechanism for program recovery.
C207 Data Structures Lab	C207.1	Understand and implement various searching and sorting algorithms.
	C207.2	Understand and implement stack, queue and its applications
	C207.3	Implement linked lists and its variations and used for general practice like rail reservation system
	C207.4	Acquire the basic knowledge on tree concepts and apply fundamental algorithmic problems including Tree traversals, arithmetic evaluations
	C207.5	Acquire the basic knowledge for selecting the appropriate tree data structure for designing a problem.
	C207.6	Design graph which is used for construction of road ways, air ways and railways for shortest paths. Able to implement different Graph traversals, and shortest paths.
C208 Digital Logic Design Lab	C208.1	Inspect the functions of basic logic gates and their application towards digital logic circuits
	C208.2	Construct and analyze simple combinational like multiplexers, de-multiplexers and adder circuits.
	C208.3	Examine the working of RAM and its application in a code converter.
	C208.4	analyze flip flops and their applications like registers and counters
C209 Seminar	C209.1	Acquire in-depth knowledge in core and allied areas of interest.
	C209.2	Analyze and synthesize information related to the areas.
	C209.3	Extract information pertinent to a specific area through literature survey to conduct research.
	C209.4	Identify the applicability of modern software and tools.
	C209.5	Contribute positively to multidisciplinary groups in emerging areas with objectivity and rational analysis.
	C209.6	Plan, organize, prepare and present effective written and oral technical reports.
	C209.7	Engage in lifelong learning to improve competence.
	C209.8	Acquire awareness on professional code of conduct in the chosen area.
	C209.9	Develop independent and reflective learning.
SEMESTER-4(II-II)		
C210 Probability and statistics	C210.1	Apply Probability theory, Random variables, Binomial, Poisson and Normal Distributions to the real world problems
	C210.2	Finding Moments and Generating functions of Binomial, Poisson and Normal Distributions
	C210.3	Acquire knowledge on normal distribution and apply it to find the population parameters
	C210.4	Understand the procedure for testing of hypothesis and apply it for Tests concerning one mean and proportion, two means- Proportions and their differences using Z-test, Student's t-test

		- F-test and Chi -square test.
	C210.5	Apply method of Least Squares for fitting a Straight line- a second degree curve- Exponential and power curve- Simple Correlation and Regression-Rank
	C210.6	Acquire knowledge on Statistical Quality Control Methods to asses quality of the product
C211 Java Programming	C211.1	Understand the principles and features of object oriented programming language.
	C211.2	Analyze and identify the behavior of real world objects through Object Oriented Concepts and writing class structures for them.
	C211.3	Illustrate the relationship between the objects and handling errors through different Java API's
	C211.4	Implement communication between objects and exchanging their functionalities using API's
	C211.5	Design Graphical User Interfaces by using plug-ins.
	C211.6	Design desktop and web based applications with different utility classes for creating look and feel applications.
C212 Advanced Data Structures	C212.1	Understand how to handle massive amounts of data which resides in external memory i.e. disks and CDs etc using external sorting algorithms and apply external sorting algorithm on massive amounts of data.
	C212.2	Understand and implement indexing techniques using hashing concepts like static hashing and dynamic hashing.
	C212.3	Apply concepts of Binary Heap and binomial queues in real time applications such as event simulations problem, selection problem.
	C212.4	Able to apply data structures such as AVL, Red-Black and Optimal Binary Search Trees for faster searching in directories.
	C212.5	Able to apply data structures such as M-way search trees, B trees and B+ trees in data base indexing.
	C212.6	Understand and apply digital search structures such as binary tries and Patricia in applications such as internet packet forwarding and data compression schemes.
C213 Computer Organization	C213.1	Understand the basic components of a computer, including CPU, memories, and input/output, and their organization.
	C213.2	Be familiar with the representation of data, addressing modes, instructions sets and arithmetic and logical operations are performed by computers.
	C213.3	Acquires the basic knowledge, the design of digital logic circuits and apply to computer organization.
	C213.4	Capability to know the organization of digital computers, basic principles and operations of different components.
	C213.5	Facilitates the organization of memory and memory management hardware.
	C213.6	Ability to understand the input out operations and how data is processed by processor for multiple inputs and output devices.
C214 Formal Languages and Automata Theory	C214.1	The computation performed with finite state machine and analyzes the problems to get the mathematical definition for FSM.
	C214.2	Form the relations between formal languages and grammars

	C214.3	Formulation of the real world problems in the form of formal languages and design some of the problems with DFA & NFA and the are able to know how to convert from one machine to other machine
	C214.4	Analyze the given problem and use the regular expression properties to form a regular expression for the given problem. And minimize the given DFA Machine
	C214.5	Simplification of the grammars and design the various machines like Moore and Mealy to apply to solve the real world and societal problems
	C214.6	Design the various solutions for problems with TMs.
C215 Advanced Data Structures Lab	C215.1	Understand and Implementing the hashing techniques
	C215.2	Understand and implementing the Balanced trees using AVL trees
	C215.3	Implement the Binary Heaps and sorting the given list of elements
	C215.4	How the graph algorithms plays major role in Computer networks and effectively finding the shortest path in the given graph
	C215.5	Implementing various algorithms for finding the minimum cost spanning trees in the given graph.
	C215.6	Implement Binary tree concepts in Huffman coding and B Trees
C216 Java Programming Lab	C216.1	Understand and design real world applications.
	C216.2	Enhanced skills in Application Programming to face Campus Interviews.
	C216.3	Developing user defined packages and availing user defined packages.
	C216.4	Understand, Analyze and apply parallel processing through Multi-Threading.
	C216.5	Understand and apply way of handling abnormal conditions through program execution
	C216.6	Design and develop window programming or GUI applications.
C217 Free Open Source Software (FOSS) Lab	C217.1	Understand the basic utilities and environment in Linux.
	C217.2	Use UNIX editors and tools to create and modify data files and documents.
	C217.3	Apply and Execute GREP, SED commands in LINUX using shell script.
	C217.4	Implementing shell programming by using AWK utility
	C217.5	Develop shell scripts in order to perform basic shell programming
	C217.6	Build UNIX applications using the shell command interpreter and UNIX commands.
SEMESTER-5(III-I)		
C301 Compiler Design	C301.1	Acquire knowledge in major concept areas of language translation.
	C301.2	Able to design lexical analyzer.
	C301.3	Acquire knowledge in different parsing techniques.
	C301.4	Able to generate intermediate code from the source code.

	C301.5	Grab the knowledge for symbol table design and organization.
	C301.6	Able to apply Code optimization techniques.
C302 Data Communication	C302.1	Understand the DCS, Analyze a communication system by separating out the different functions provided by the network.
	C302.2	Classify the Modern optical communications systems and necessary components required in system can be identified. Understand the characteristics of DCS and design the optical fiber transmission media.
	C302.3	Understand the various digital modulation techniques like PCM, ASK, FSK, PSK & DPSK etc. & Analyze the performance of various systems to determine the probability error.
	C302.4	Understand and analyze different wireless communication techniques like Satellite communication etc.,
	C302.5	Understand the fundamentals of cellular radio system design and advantages of cellular systems.
	C302.6	Understand and analyze different types of error detection methods and Modems for future networks.
C303 Principles of Programming Languages	C303.1	Understand and Describe syntax, semantic of languages and designing the parsing tables to expertise in program compilation and execution.
	C303.2	Understand and apply the concepts data, data types and basic statements in the implementing the programs in various programming languages.
	C303.3	Understand, design and apply the functions, subprograms through modular approach for the development of applications using various programming languages.
	C303.4	Understand and apply the OOPs concepts to develop applications to solve real time problems.
	C303.5	To understand importance of functional programming languages
	C303.6	Understand the importance of logic programming languages and to know how to apply PROLOG to solve the Complex problems in Artificial Intelligence domain.
C304 Database Management Systems	C304.1	Understand the characteristics of DB, File systems, concepts of Database schema, instances and data independence, three tier architecture.
	C304.2	Understand how to create relational database with key constraints and database language operations, apply SQL to perform various operation on RDBS as per the user requirements.
	C304.3	Design the relational database by using OOP concepts with ER-Model and apply the Advanced SQL query techniques to retrieve the data as per the client need.
	C304.4	Apply the normalization techniques to remove the anomalies in the database and get the optimized tables for the fast retrieval of the data from DB.
	C304.5	Understand and apply the transaction management techniques on the data base without loss of any transaction and applied the database recovery techniques to protect the data in database.

	C304.6	Understand the way of Organizing the data through different efficient storage techniques
C305 Operating Systems	C305.1	Understand how to describe the general architecture of operating systems with various functions and how the system calls executed in the system
	C305.2	Acquire knowledge on process concepts and how processes and threads are scheduled for the execution by CPU with different scheduling algorithms.
	C305.3	Understand and apply software and hardware synchronization concepts for solving various classical synchronization problems.
	C305.4	Apply various memory management techniques to manage main memory and virtual memory efficiently for the execution of multiple programs to increase the multi programming.
	C305.5	Understand deadlock situations and deadlock handling methods to prevent, avoid and detecting deadlocks in the system.
	C305.6	Analyze various structures and providing how to interface, implement mass storage devices through file system and applying various disk scheduling algorithms for fast access of disk to improve the system efficiency.
C306 Compiler Design Lab	C306.1	Demonstrate a working understanding of process of lexical Analysis with different tools
	C306.2	To understand phases of compilation with suitable examples
	C306.3	Design different parsers for compilation
	C306.4	To understand and implement code optimization techniques
C307 Operating System & Linux Programming Lab	C307.1	Analyze and implement various process scheduling programs
	C307.2	Understand and implement various memory management algorithms.
	C307.3	Identify various solutions for critical section problems and also implement different algorithms that are applied in virtual memory.
	C307.4	Understand and implement various file allocation algorithms
	C307.5	Describe and write shell scripts in order to perform basic shell programming.
	C307.6	Analyze various program editors and implement small program in Linux environment.
C308 Database Management Systems Lab	C308.1	Use database authorization in order to access database for the different kinds of the user.
	C308.2	For a Specified Database create the tables by properly specifying Integrity constraints.
	C308.3	Enter at least five tuples for each relation and use the SQL commands such as DDL, DML, DCL, and TCL to access data from database objects.
	C308.4	To solve Query for a given Database. (Simple queries and Nested queries.)
	C308.5	Programming PL/SQL including stored procedures, stored functions, cursors, packages, Triggers.
C309 Seminar	C309.1	Acquire in-depth knowledge in core and allied areas of interest.

	C309.2	Analyze and synthesize information related to the areas.
	C309.3	Extract information pertinent to a specific area through literature survey to conduct research.
	C309.4	Identify the applicability of modern software and tools.
	C309.5	Contribute positively to multidisciplinary groups in emerging areas with objectivity and rational analysis.
	C309.6	Plan, organize, prepare and present effective written and oral technical reports.
	C309.7	Engage in lifelong learning to improve competence.
	C309.8	Acquire awareness on professional code of conduct in the chosen area.
	C309.9	Develop independent and reflective learning.
SEMESTER-6(III-II)		
C310 Computer Networks	C310.1	Identify and analyze the different types of network topologies and protocols to design a network.
	C310.2	Enumerate the differences between layers of the OSI model and TCP/IP.
	C310.3	Design and Experiment Cyclic redundancy check concept.
	C310.4	Understand and analyze various IEEE standards
	C310.5	Acquire the knowledge on basic concepts of Random Access Protocols.
	C310.6	Understand and analyze HTTP architecture and WAP architecture.
C311 Data Ware housing and Mining	C311.1	Discuss the evaluation of database technology and understand how data mining system works, integration to database and data warehouse.
	C311.2	Apply various data pre-processing Methods to produce qualitative data.
	C311.3	To discuss the Data Warehouse Architecture And Analyze Data Cube Operations, Efficient data Accessing Methods.
	C311.4	Evaluate the various data mining Tasks and how to apply these tasks to relevant applications.
	C311.5	To analyze frequent item patterns using association rule mining algorithms.
	C311.6	Analyze the clustering and classify the data using different supervising and unsupervising algorithms.
C312 Design and Analysis of Algorithms	C312.1	Estimating space and time complexities and applying the way of computing time and space complexities.
	C312.2	Design ,Analyze and Apply algorithms using the divide-and-conquer paradigm
	C312.3	Design ,Analyze and Apply algorithms using the greedy method
	C312.4	Design ,Analyze and Apply algorithms using the dynamic programming paradigm
	C312.5	Design ,Analyze and Apply algorithms using back tracking
	C 312.6	Design ,Analyze and Apply algorithms using Branch and Bound
C313 Software Engineering	C313.1	Understanding of software process models and evolutionary models
	C313.2	Understand the requirements and design the SRS
	C313.3	Design and conduct experiments, as well as to analyze and interpret data.

	C313.4	Applying coding standards and software testing approaches
	C313.5	Evaluating software related issues.
	C313.6	Apply quality control process to ensure product quality.
C314 Web Technologies	C314.1	Understanding the design and functionalities of web page by applying style sheets and dynamic scripts.
	C314.2	Analyzing the web pages using different namespaces and parsing the data from the document.
	C314.3	Applying and consuming web services in the web documents for request-response handling between client and server.
	C314.4	Creating server side scripts for identifying client requests and organize the data in database.
	C314.5	Analyzing text by writing arbitrary expressions for data summarizing and report generating.
	C314.6	Creating server side applications using model view controller framework by applying object oriented features.
C315 Computer Networks Lab	C315.1	Understand framing techniques implementations
	C315.2	Understand routing algorithm implementations
	C315.3	Identify the TCP/UDP Protocol implementations.
	C315.4	Understand and familiarize with IPC techniques implementations.
	C315.5	Understand TCP Client Server Programming.
	C315.6	Understand UDP Client Server Programming.
C316 Software Engineering Lab	C316.1	Designing the requirement document.
	C316.2	Analyzing the required effort and time for the project completion.
	C316.3	Analyzing the different risks associated with the project
	C316.4	Analyze & Design the application using Object Oriented Concepts.
	C316.5	Designing of Ad-hoc Test Cases.
	C316.6	Understanding the application at the analysis and maintenance stages.
C317 Web Technologies Lab	C317.1	Develop web pages using HTML and apply validations to web page using Java script.
	C317.2	Apply style sheets to web pages.
	C317.3	Describe and develop web pages using XML
	C317.4	Develop web applications using Ruby.
	C317.5	Develop web applications using Perl.
	C317.6	Develop web applications using PHP.
C318 IPR and Patents	C318.1	Knowledge on basic concepts of Intellectual Property , Innovations and Inventions of Intellectual Property Law
	C318.2	Evaluate the principles and rights afforded by Copyright, its infringement and International Copyright Law.
	C318.3	Analyze Patent registration requirements, infringement and Litigation, new developments and international laws
	C318.4	Registration Process of Trade Marks, Interparty proceedings, litigations , claims and global factors related to trade marks
	C318.5	Conceptual awareness about trade Secrets, Employee Confidentiality Agreement, Trade Secret Litigation and breach of law
	C318.6	Elucidate Cyber Law and Cyber Crimes , E-commerce, International aspects of Computer and Online Crime

SEMESTER-7(IV-I)		
C401 Cryptography and Network Security	C401.1	Understand the importance of Data Security.
	C401.2	Analyze Possible threats and attacks on Data.
	C401.3	Develop some Encryption and Decryption Algorithms.
	C401.4	Acquire the knowledge in various authentication techniques.
	C401.5	Idea about malwares and know the importance of software updating.
	C401.6	Analyze various protocols which are very useful for transfer the information securely from source to destination
C402 UML & Design Patterns	C402.1	Memorize the software development life cycle based on unified process
	C402.2	Understanding the FURPS model and Use case model
	C402.3	Develop System sequence diagrams for use case model and Domain mode
	C402.4	Apply various design patterns to solve the given problem.
	C402.5	Create various UML diagrams based on analysis.
	C402.6	Apply Architecture, Packaging model, refinements to UML diagrams.
C403 Mobile Computing	C403.1	Acquire the basic knowledge of mobile communication concepts.
	C403.2	Understand network layers in mobile computing and also each layer description.
	C403.3	Apply the mobile computing concepts in mobile application development environment.
	C403.4	Implement and analyze network layer protocols like AODV,DSDV etc.
	C403.5	Select the suitable protocol for corresponding mobile network scenario implementation in network layer or transport layer.
	C403.6	Investigate on any new mobile communication issue using mobile computing concepts.
C404 Software Testing Methodologies	C404.1	Understand and apply Software Testing Knowledge.
	C404.2	Analyze and design to conduct a software test process.
	C404.3	Usage of various communication methods and skills to communicate with their team-mates to conduct their practice-oriented software testing.
	C404.4	Understanding of various software testing problems and able to design the solutions.
	C404.5	Apply knowledge to design the test cases effectively and ensure the quality of the product.
	C404.6	Apply knowledge to use modern software testing tools.
C405 Hadoop and Big Data	C405.1	Understanding data structures and implementing persistence of objects in file streams.
	C405.2	Creating and configuring cluster in the distributed environment to process map reduce jobs.
	C405.3	Understanding the map reduce architecture and its job flow in parallel processing.
	C405.4	Implementing hadoop APIs for processing data across distributed environment and generating map reduce jobs.

	C405.5	Writing pig latin scripts for analyzing semi-structured data and generating map reduce jobs.
	C405.6	Creating schemas and writing Hive queries for analyzing different data formats and generating map reduce jobs.
C406 UML & Design Patterns Lab	C406.1	Identify and analyze the events, use cases, domain classes for the System.
	C406.2	Develop Use case scenarios, use case diagrams of the system.
	C406.3	Apply appropriate design patterns to the problem.
	C406.4	Differentiate structural and behavioral aspects of the system.
	C406.5	Familiar with the usage of various UML tools to developing UML diagrams.
	C406.6	Develop various Architectural model of the system.
C407 Mobile Application Development Lab	C407.1	Define the mobile devices types and its technologies
	C407.2	Understand the basics of J2ME and Android platforms.
	C407.3	Execute the basic application in J2ME and android using IDE tool.
	C407.4	Sketch the life cycle of J2ME ns Android application development.
	C407.5	Differentiate the application programs of J2ME and Android technology.
	C407.6	Develop the basic applications in J2ME and Android platforms.
C408 Software Testing Lab	C408.1	Designing the adhoc test cases.
	C408.2	Designing the test cases based on dynamic testing techniques.
	C408.3	Designing the state machines.
	C408.4	Performing data flow & mutation testing.
	C408.5	Working with modern automated testing tools
C409 Hadoop & Big Data Lab	C409.1	Understand the Collections Framework Concept.
	C409.2	Experiment the Installation of Hadoop
	C409.3	Analyze the Data sets and Write Map Reduce Programs
	C409.4	Experiment the commands with Pig Latin
	C409.5	Experiment the commands using HIVE.
	C409.6	Understand the concept of joins and group by operations.
SEMESTER-8(IV-II)		
C410 ESRTOS	C410.1	Understand the basic concepts of embedded systems
	C410.2	Understand the basic architecture of 8051 and its internal implementation.
	C410.3	Analyze various preemptive and Non-preemptive task scheduling algorithms
	C410.4	Analyze various communication mechanisms for inter process communication in real time operating systems.
	C410.5	Analyze various task synchronization techniques to solve the critical section problems in real time operating systems.
	C410.6	Understand various software process models which are used for designing the microcontrollers and embedded systems.
C411 Human Computer Interaction	C411.1	Understand the importance of user interface in software development.
	C411.2	Design the menu items and organize in a convenient structure

	C411.3	Apply an interactive design process and universal design principles for the designing HCI systems.
	C411.4	Design the functional issues by balancing the fashion and providing the quality.
	C411.5	Discuss the tasks and dialogs list of relevant HCI systems based on task analysis and dialog design.
	C411.6	Analyze Various Textual Documents and Database Querying and Multimedia Document Searches
C412 Cloud Computing	C412.1	Define the basics and motivation of cloud computing like virtualization concepts.
	C412.2	Understand various management and other distinguishes cloud services of AWS, Micro Soft Azure and Google Apps.
	C412.3	Apply the fundamental concepts in data centres to understand the tradeoffs in power, efficiency and cost by Load balancing approach.
	C412.4	Analyze various cloud programming models and apply them to solve problems in the cloud.
	C412.5	Illustrate the fundamental concepts of cloud storage and demonstrate their use in storage systems such as Amazon S3 and HDFS.
	C412.6	Investigate the cloud service provider for their own use or service deployment.
C413 Distributed Systems	C413.1	Understand and analyze the characteristics of Distributed Systems with different architectural and communication models.
	C413.2	Understand and analyze the various communication techniques and analyze the network IP address allocation.
	C413.3	Understand the Distributed objects and apply the RMI Concepts for case study of JAVA RMI.
	C413.4	Understand and analyze the concepts of OS layer architecture and creation of threads and processes.
	C413.5	Understand and analyze the importance of replication for Reliability and Availability in Distributed system.
	C413.6	Understand the Distributed deadlocks and how to handle the deadlock in Distributed Systems
C414 MASN	C414.1	Able to acquire some knowledge on routing protocols and topologies.
	C414.2	Able to understand the drawbacks of manets.
	C414.3	Acquiring the knowledge on TCP layer and trying to solve the issues of Mac layer.
	C414.4	Able to learn the basic concepts of wireless sensor networks and Mac layer advancements.
	C414.5	Implementation of various routing protocols of wsn's can be learnt and understood.
	C414.6	Get knowledge on various simulators like TinyOS, NS-2 and TOSSIM to analyze the performance of wsn's.
C415 Management Science	C415.1	Analyze and evaluate management concept and its implementation in aim of achieving organizational goals.
	C415.2	To Equip with the concepts of operations, project management through technical relationships of input and output and inventory control
	C415.3	To understand the importance and vital role of human

		resources power in the main functional areas of organization i.e., Marketing Management, Human Resource Management
	C415.4	Project handling and controlling techniques for optimum utilization of resources
	C415.5	Describes the concept and practical issues relating to strategic management and its role in long-term decision making
	C415.6	Apply modern management techniques MIS, MRP, JIT and ERP etc to meet global challenges in effective manner
C416 Project	C416.1	Acquire in-depth knowledge in core and allied areas of interest.
	C416.2	Analyze critically chosen project topic for conducting research.
	C416.3	Apply knowledge gained through Programme, self learning and experience for solution of a given problem efficiently solution of a given problem efficiently
	C416.4	Undertake research confidently in the project domain.
	C416.5	Use the techniques, skills and modern engineering tools necessary for project work.
	C416.6	Perform harmonically in multi-disciplinary, multi-cultural groups, and develop a high level of interpersonal skills. High level of interpersonal skills.
	C416.7	Manage projects in respective disciplines and multidisciplinary environments with due consideration to cost and time efficiency. Due consideration to cost and time efficiency.
	C416.8	Develop communication skills, both oral and written for preparing and presenting reports. reports
	C416.9	Engage in lifelong learning to improve knowledge and competence continuously.
	C416.10	Understand professional and ethical responsibility for sustainable development of society. Society.
	C416.11	Develop independent and reflective learning.
	C416.12	Whether Project selected is related to Environment or Sustainable