LENDI INSTITUTE OF ENGINEERING AND TECHNOLOGY

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

LIET/CSE/D-/2017-18/1

REV.: 0.0:0.0

LIST OF COURSE OUTCOMES (CO)

Academic Year: 2017-18

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	Realization 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	Imbibed 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, Jacobean 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	Recognizes 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 utilization 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 Engineering Chemistry Laboratory	**C107.1**	Students have practical exposure on volumetric analysis
	C107.2	Students acquire the skill to perform the Acid-Base titration in the real lab.
	C107.3	Students acquire the skill to perform the Redox titrations of a sample in the real lab
	C107.4	Students acquire the skill to prepare standard solutions of Mohr's salt.
	C107.5	Students acquire the skill to perform the Iodometric titration in the real lab
	C107.6	Students acquire the skill to perform the quality of raw water in the real lab
	C107.7	Students acquire the skill to perform the Complex metric-titration in the real lab
	C107.8	Students would be aware of instrumental methods of chemical analysis
	C107.9	Students acquire the skill to determine the concentration of H+ ions for a given water sample using. Ph Meter in the real lab.
	C107.10	Students would be aware of instrument like conductivity meter
	C107.11	Students would be aware of instrument like potential meter
	C107.12	Students acquire the skill to determine the Vitamin – C concentration using volumetric analysis
C108 English Communication Skills Lab-1	**C108.1**	Enabling students to use Computer assisted Language Laboratory (CALL) to enhance their pronunciation through stress, intonation and rhythm for routine and spontaneous interaction

	C108.2	Attainment of communicative competence for the fulfillment of academic, professional and social purposes.
	C108.3	Attainment of language Proficiency through Contextualized, Task Based Activities to realize employment potential at the end of the course.
	C108.4	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.
	C108.5	Development of fluency and accuracy for effective and professional communication in real-time situations by using appropriate verbiage and contextual knowledge.
	C108.6	Realization of technical communicative competence and attainment of group dynamism and problem solving skills through standard oral and written language models.
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	Realization 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	Imbibed 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, Diffract meter and Polari meter.
	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 fulfillment 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	Realization of technical communicative competence and attainment of group dynamism and problem solving skills through standard oral and written language models.

C117 Engineering Physics Laboratory	**C117.1**	Identify the working principles of laboratory experiments in optics, mechanics, electromagnetic and electronics.
	C117.2	Apply the working principles of laboratory experiments in optics, mechanics, electromagnetic and electronics and perform the experiments using required apparatus.
	C117.3	Compute the required parameter by suitable formula using experimental values (observed values) in mechanics, optics, electromagnetic and electronic experiments.
	C117.4	Analyze the experimental results through graphical interpretation.
	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.
C118 Engineering Workshop & IT Workshop	**C118.1**	Identify the working principles of acid-base, redox, and complex metric, conduct metric, potentiometric titrations.
	C118.2	Apply the working principles of acid-base, redo, complex metric, conduct metric, potentiometric titrations to perform the experiments using required apparatus.
	C118.3	Compute the required parameter by suitable formula using experimental values (observed values) of acid-base, redox, and complex metric, conduct metric, potentiometric titrations.
	C118.4	Analyze the experimental results through percentage of error.
	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 in acid-base, redox, complex metric, and conduct metric, potentiometric titrations.
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 and supply analysis
	C201.2	Solve engineering problems by applying knowledge of economics
	C201.3	Analyze the consciousness about market structures and pricing methods of industries
	C201.4	Identify the business as their own and understand different stages of business cycle
	C201.5	Evaluate financial statements and their analysis through ratios etc.,
	C201.6	Interprete financing methods, their applicability in decision making and problem-solving skills according to new trends.
C202	**C202.1**	Design and implementation of a C++ program.

Object Oriented Programming through C++	**C202.2**	Outline the basic knowledge in C++ programming, operators, control structures, functions, overloading, recursion.
	C202.3	Create classes and objects in C++.
	C202.4	Develop inheritance and virtual functions programs.
	C202.5	Analyze the templates, function templates for generic programming and understand the Exception handling mechanism for program recovery.
	C202.6	Illustrate the file system very effectively so that implement various operations on files
C203 Mathematical Foundations of Computer Science	**C203.1**	Outline the notions of proposition and predicates
	C203.2	Analyze relations and functions concepts
	C203.3	Demonstrate on number theory.
	C203.4	Illustrate counting techniques, combinatory and Algebraic Systems.
	C203.5	Apply recurrence relations by using various methods.
	C203.6	Apply 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.
	C204.3	Demonstrate the combinational circuits.
	C204.4	Outline the function of bitable element and the different latches and flip-flops.
	C204.5	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	Outline the concepts of stacks and queues
	C205.3	Apply linked list data structures
	C205.4	Analyze binary trees and binary search trees
	C205.5	Identify binary search trees to solve problems.
	C205.6	Apply graphs to solve various problems.
C206 Object Oriented Programming	**C206.1**	Create object oriented programs.
	C206.2	Develop programs using parameter passing mechanisms, function overloading, friend functions, exception handling and

Lab		recursion.
	C206.3	Develop programs member functions, constructors, Destructors, variants in them, operator overloading, type conversions.
	C206.4	Illustrate inheritance programs.
	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**	Develop programs on searching and sorting.
	C207.2	Create programs on stack and queue.
	C207.3	Design programs using linked list.
	C207.4	Apply tree traversal techniques.
	C207.5	Analyze tree data structure to design a program.
	C207.6	Design graph to implement 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	Analyze multiplexers, de-multiplexers
	C208.3	Construct adder circuits.
	C208.4	Examine the working of RAM and its application in a code converter.
	C208.5	Analyze flip flops and their applications
	C208.6	Design registers and counters
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	Find Moments and Generating functions of Binomial, Poisson and Normal Distributions
	C210.3	Apply normal distribution find the population parameters
	C210.4	Apply Z-test, Student's t-test - F-test and Chi -square test.
	C210.5	Apply Least Squares for fitting a Straight line- a second degree curve- Exponential and power curve- Simple Correlation and Regression-Rank
	C210.6	Analyze statistical Quality Control Methods to asses quality of the product
C211 Java	**C211.1**	Outline the principles and features of object oriented programming language.

Programming	**C211.2**	Analyze the behavior of real world objects through Object Oriented Concepts.
	C211.3	Illustrate the relationship between the objects
	C211.4	Develop communication between objects.
	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**	Apply external sorting algorithm on massive amounts of data.
	C212.2	Analyze static hashing and dynamic hashing.
	C212.3	Apply concepts of Binary Heap and binomial queues
	C212.4	Apply data structures such as AVL, Red-Black and Optimal Binary Search Trees for faster searching in directories.
	C212.5	Apply M-way search trees, B trees and B+ trees in data base indexing.
	C212.6	Apply digital search structures such as binary trees.
C213 Computer Organization	**C213.1**	Analyze the basic components of a computer, including CPU, memories, and input/output, and their organization.
	C213.2	Illustrate addressing modes, instructions sets and operations.
	C213.3	Design of digital logic circuits.
	C213.4	Elaborate organization of digital computers
	C213.5	Explain organization of memory management.
	C213.6	Summarize the input out operations.
C214 Formal Languages and Automata Theory	**C214.1**	Explain the concepts of Finite State Machine and its components, variants.
	C214.2	Discus the relations between formal languages and grammars
	C214.3	Design of Finite Automata and its Variants
	C214.4	Design the Minimized Finite Automata and Regular Expressions
	C214.5	Simplify Context Free Grammars
	C214.6	Design the TMs for the various Problems.
C215 Advanced Data Structures Lab	**C215.1**	Develop programs using hashing techniques
	C215.2	Develop Balanced trees using AVL trees
	C215.3	Develop programs on Binary Heaps

	C215.4	Design programs on graph algorithms to find the shortest path.
	C215.5	Find the minimum cost spanning trees in the given graph.
	C215.6	Develop programs on B Trees
C216 Java Programming Lab	**C216.1**	Design real world applications.
	C216.2	Apply Application Programming to face Campus Interviews.
	C216.3	Develop user defined packages.
	C216.4	Apply parallel processing through Multi-Threading.
	C216.5	Apply way of handling abnormal conditions through program execution
	C216.6	Develop window programming or GUI applications.
C217 Free Open Source Software (FOSS) Lab	**C217.1**	Summarize basic utilities and environment in Linux.
	C217.2	Create and modify data files and documents.
	C217.3	Apply grep and sed commands.
	C217.4	Develop 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**	Outline the major concept areas of language translation.
	C301.2	Design lexical analyzer.
	C301.3	Illustrate the different parsing techniques.
	C301.4	Create intermediate code from the source code.
	C301.5	Analyze the symbol table design and organization.
	C301.6	Apply Code optimization techniques.
C302 Data Communication	**C302.1**	Analyze basic communication system.
	C302.2	Classify the Modern optical communications systems and necessary components required in system can be identified.
	C302.3	Compare PCM, ASK, FSK, PSK & DPSK.
	C302.4	Analyze different wireless communication techniques like Satellite communication etc.,
	C302.5	Illustrate the fundamentals of cellular radio system.
	C302.6	Analyze different types of error detection methods and Modems for future networks.
C303	**C303.1**	Explain the syntax and semantic of languages.

Principles of Programming Languages	**C303.2**	Apply data types in various programming languages.
	C303.3	Apply the functions using various programming languages.
	C303.4	Apply the OOPs concepts to solve real time problems.
	C303.5	Illustrate the importance of functional programming languages
	C303.6	Apply PROLOG to solve the Complex problems in Artificial Intelligence domain.
C304 Database Management Systems	**C304.1**	Analyze the characteristics of DB, File systems.
	C304.2	Create relational database with key constraints.
	C304.3	Design the relational database by using OOP concepts.
	C304.4	Apply the normalization techniques.
	C304.5	Apply the transaction management techniques.
	C304.6	Illustrate the importance of storage techniques.
C305 Operating Systems	**C305.1**	Illustrate the general architecture of operating systems with various functions and how the system calls executed in the system
	C305.2	Discuss various CPU scheduling algorithms for process and threads
	C305.3	Apply software and hardware synchronization concepts, tools 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	Explain 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 and implementation of disk scheduling algorithms
C306 Compiler Design Lab	**C306.1**	Demonstrate a working understanding of process of lexical
	C306.2	Develop lexical phase with different tools
	C306.3	Analyze phases of compilation with suitable examples
	C306.4	Analyze Semantic parser.
	C306.5	Design different parsers for compilation
	C306.6	Develop code optimization techniques
C307	**C307.1**	Illustrate various process scheduling programs

Operating System & Linux Programming Lab	**C307.2**	Create programs on memory management.
	C307.3	Design various solutions for critical section problems
	C307.4	Analyze file allocation algorithms
	C307.5	Develop shell scripts in shell programming.
	C307.6	Analyze various program editors.
C308 Database Management Systems Lab	**C308.1**	Illustrate database authorization for the different kinds of users.
	C308.2	Create the tables by properly specifying Integrity constraints.
	C308.3	Create database objects.
	C308.4	Solve Query for a given Database.
	C308.5	Develop programs on PL/SQL.
	C308.6	Develop programs on stored functions and Triggers
SEMESTER-6(III-II)		
C310 Computer Networks	**C310.1**	Discuss the architectures of different Reference models and different topologies.
	C310.2	Analyze the concept of data, signal and data transmission Techniques.
	C310.3	Analyze data link layer framing techniques and Link Layer Protocols
	C310.4	Explain different network routing algorithms
	C310.5	Analyze various IEEE standards for physical and link Layers.
	C310.6	Explain HTTP client/server Operational model and Wireless Application Protocol stack architecture
C311 Data Ware housing and Mining	**C311.1**	Discuss the evaluation of database technology.
	C311.2	Apply various data pre-processing Methods to produce qualitative data.
	C311.3	Discuss the Data Warehouse Architecture.
	C311.4	Evaluate the various data mining Task.
	C311.5	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**	Estimate space and time complexities
	C312.2	Analyze algorithms using the divide-and-conquer paradigm
	C312.3	Analyze algorithms using the greedy method
	C312.4	Analyze algorithms using the dynamic programming paradigm

	C312.5	Analyze algorithms using back tracking
	C 312.6	Analyze algorithms using Branch and Bound
C313 Software Engineering	**C313.1**	Explain software process models and evolutionary models
	C313.2	Design the SRS.
	C313.3	Design and conduct experiments, as well as to analyze and interpret data.
	C313.4	Apply coding standards and software testing approaches
	C313.5	Evaluate software related issues.
	C313.6	Apply quality control process to ensure product quality.
C314 Web Technologies	**C314.1**	Design web page with style sheets and dynamic scripts.
	C314.2	Analyze the web pages using different namespaces and parsing the data from the document.
	C314.3	Apply web services in the web documents for request-response handling between client and server.
	C314.4	Create server side scripts for identifying client requests and organize the data in database.
	C314.5	Analyze text by writing arbitrary expressions for data summarizing and report generating.
	C314.6	Create server side applications using model view controller framework by applying object oriented features.
C315 Computer Networks Lab	**C315.1**	Design framing techniques.
	C315.2	Develop routing algorithms.
	C315.3	Identify the TCP/UDP Protocol implementations.
	C315.4	Develop IPC techniques.
	C315.5	Develop TCP Client Server Programming.
	C315.6	Develop UDP Client Server Programming.
C316 Software Engineering Lab	**C316.1**	Design the requirement document.
	C316.2	Analyze the required effort and time for the project completion.
	C316.3	Analyze the different risks associated with the project

	C316.4	Design the application using Object Oriented Concepts.
	C316.5	Design of Ad-hoc Test Cases.
	C316.6	Analyze 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	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.
SEMESTER-7(IV-I)		
C401 Cryptography and Network Security	**C401.1**	Illustrate the importance of Data Security.
	C401.2	Analyze Possible threats and attacks on Data.
	C401.3	Develop some Encryption and Decryption Algorithms.
	C401.4	Discuss authentication techniques.
	C401.5	Explain the importance of software updating.
	C401.6	Analyze various protocols for transfer of information securely.
C402 UML & Design Patterns	**C402.1**	Explain the software development life cycle based on unified process
	C402.2	Explain 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	**C403.1**	Discuss mobile communication concepts.

Computing	**C403.2**	Analyze network layers in mobile.
	C403.3	Apply the mobile computing concepts in mobile application development environment.
	C403.4	Analyze network layer protocols like AODV,DSDV etc.
	C403.5	Find suitable protocol for corresponding mobile network scenario implementation in network layer or transport layer.
	C403.6	Identify any new mobile communication issue using mobile computing concepts.
C404 Software Testing Methodologies	**C404.1**	Apply Software Testing Knowledge.
	C404.2	Analyze software test process.
	C404.3	Illustrate various communication methods to conduct software testing.
	C404.4	Design the solutions on various software testing problems.
	C404.5	Design test cases effectively to ensure quality of the product.
	C404.6	Apply knowledge to use modern software testing tools.
C405 Hadoop and Big Data	**C405.1**	Apply persistence of objects in file streams.
	C405.2	Create cluster in the distributed environment to process map reduce jobs.
	C405.3	Outline map reduce architecture in parallel processing.
	C405.4	Apply hadoop APIs for processing data across distributed environment.
	C405.5	Analyze semi-structured data to generate map reduce jobs.
	C405.6	Create schemas using Hive queries.
C406 UML & Design Patterns Lab	**C406.1**	Identify the events, use cases, domain classes for the System.
	C406.2	Develop Use case scenarios of the system.
	C406.3	Apply appropriate design patterns to the problem.
	C406.4	Differentiate structural and behavioral aspects of the system.

	C406.5	Apply UML tools to develop UML diagrams.
	C406.6	Develop Architectural model of the system.
C407 Mobile Application Development Lab	**C407.1**	Define the mobile devices types and its technologies
	C407.2	Outline the basics of J2ME and Android platforms.
	C407.3	Develop basic application in J2ME and android using IDE tool.
	C407.4	Design the life cycle of J2ME ns Android application development.
	C407.5	Compare 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**	Design the ad hoc test cases.
	C408.2	Design the test cases based on dynamic testing techniques.
	C408.3	Design the state machines.
	C408.4	Develop data flow testing.
	C408.5	Develop mutation testing
	C408.6	Experiment with modern automated testing tools
C409 Hadoop & Big Data Lab	**C409.1**	Outline the Collections Framework Concept.
	C409.2	Examine the Installation of Hadoop.
	C409.3	Analyze the Data sets and Write Map Reduce Programs
	C409.4	Experiment with Pig Latin
	C409.5	Experiment with HIVE.
	C409.6	Analyze the concept of joins and group by operations.
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C410 Human Computer Interaction	**C410.1**	Illustrate the importance of user interface in software development.
	C410.2	Design the menu items in a convenient structure
	C410.3	Apply an interactive design process and universal design principles for the designing HCI systems.
	C410.4	Design the functional issues by balancing the fashion and providing the quality.
	C410.5	Discuss the tasks and dialogs list of relevant HCI systems based on task analysis and dialog design.
	C410.6	Analyze Various Textual Documents and Database Querying and Multimedia Document Searches
C411 MASN	**C411.1**	Outline routing protocols and topologies.
	C411.2	Illustrate the drawbacks of manets.
	C411.3	Solve the issues of Mac layer.
	C411.4	Illustrate the basic concepts of wireless sensor networks and Mac layer advancements.
	C411.5	Design various routing protocols of wireless sensor network.
	C411.6	Illustrate various simulators for the performance of wsn.
C412 ERTOS	**C412.1**	Illustrate the basic concepts of embedded systems
	C412.2	Outline basic architecture of 8051 and its internal implementation.
	C412.3	Analyze various preemptive and Non-preemptive task scheduling algorithms
	C412.4	Analyze various communication mechanisms for inter process communication in real time operating systems.
	C412.5	Analyze various task synchronization techniques to solve the critical section problems in real time operating systems.
	C412.6	Compare software process models for microcontrollers.
C413 Cloud Computing	**C413.1**	Define the basics and motivation of cloud computing like virtualization concepts.
	C413.2	Distinguish cloud services of AWS, Micro Soft Azure and Google Apps.
	C413.3	Apply the fundamental concepts in data centres to understand the tradeoffs in power, efficiency and cost by Load balancing approach.
	C413.4	Analyze various cloud programming models and apply them to solve problems in the cloud.
	C413.5	Illustrate the fundamental concepts of cloud storage and demonstrate their use in storage systems such as Amazon S3 and HDFS.

	C413.6	Examine the cloud service provider for their own use or service deployment.
C414 Distributed Systems	**C414.1**	Analyze the characteristics of Distributed Systems with different architectural and communication models.
	C414.2	Analyze the various communication techniques.
	C414.3	Apply the RMI Concepts for case study of JAVA RMI.
	C414.4	Analyze the concepts of OS layer architecture.
	C414.5	Analyze the importance of replication for Reliability and Availability in Distributed system.
	C414.6	How to handle the deadlock in Distributed Systems
C415 Management Science	**C415.1**	Analyze and evaluate management concept and its implementation in aim of achieving organizational goals.
	C415.2	Identify technical relationships of input and output and inventory control
	C415.3	Identify 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	Organize Project handling and controlling techniques for optimum utilization of resources
	C415.5	Discuss 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
	C416.12	Conclude Project selected is related to Environment or Sustainable

Faculty In-charge **Head of the Department**