DEPT. OF COMPUTER SCIENCE AND ENGINEERING

R16 Regulation - COURSE OUTCOMES

S. No	CLASS	REGULATION	Subject	Course Code	CO's	Course Oucomes
1	I/I	R-16	Mathematics - I	MA101BS	CO-1	Apply the matrix representation of a set of linear equations and to analyse the solution of the system of equations
					CO-2	Able to use the Eigen values and Eigen vectors. Reduce the quadratic form to canonical form using orthogonal transformations
					CO-3	Analyze the nature of sequence and series.
					CO-4	Solve the applications on the mean value theorems. Evaluate the improper integrals using Beta and Gamma functions
					CO-5	Estimate the extreme values of functions of two variables with/ without constraints.
2	I/I	R-16	Chemistry	CH102BS	CO-1	Describe The knowledge of atomic, molecular and electronic changes, band theory related to conductivity
					CO-2	Develop innovative methods to produce soft water for industrial use and potable water at cheaper cost
					CO-3	Apply The required principles and concepts of electrochemistry, corrosion and inunderstanding the problem of water and its treatments. electron chemistry
					CO-4	Analyse The knowledge of confrontational and confirmation analysis of molecules and reaction mechanisms
					CO-5	Explain concepts on basic spectroscopy and application to medical and other fields
3	I/I	R-16	Basic Electrical Engineering	EE103ES	CO-1	Analyze and solve electrical circuits using network theorems.
					CO-2	construct and analyze simple AC circuits
					CO-3	Analyze single phase and three phase transformer
					CO-4	Construct and analyze the working principles of Electrical Machines
					CO-5	Investigate the knowledge on batteries and Protective Equipment's.
4	I/I	R-16	Engineering Workshop	ME105ES	CO-1	Able to Study and practice on machine tools and their operations
					CO-2	Analyze manufacturing of components using workshop trades including pluming, fitting, carpentry, foundry, house wiring and welding.
					CO-3	Identify and apply suitable tools for different trades of Engineering processes including drilling, material removing, measuring, chiseling.
					CO-4	Apply basic electrical engineering knowledge for house wiring practice.
					CO-5	Ability to design and model different Prototypes in the Carpentry Trade Such as cross Lap Joint and Dovetail Joint.
5	I/I	R-16	English	EN105HS	CO-1	Use English Language effectively in spoken and written forms.
					CO-2	Intrupt the given text sand respond appropriately.
					CO-3	Demonstrate confidently in various contexts and different cultures.
					CO-4	Execute basic proficiency in English including reading and listening comprehension, writing and speaking skills.
					CO-5	Apply new oral vocabulary words in context to reinforce meaning.
6	I/I	R-16	Engineering Chemistry Lab	CH106BS	CO-1	Apply the method like hardness of water and rate of corrosion of mild steel in various conditions.
					CO-2	Students are analyzing the various water samples with different methods and various water treatment methods for industrial usages.
					CO-3	Students are able to able to perform methods such as conductometry, potentiometry and pH metry in order to find out the concentrations or equivalence points of acids and bases
					CO-4	Students are able to create polymers like Bakelite and nylon-6.
					CO-5	Students are able to evaluate the saponification value, surface tension and viscosity of lubricant oils

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7	I/I	R-16	English Language and Communication Skills Lab	EN107HS	CO-1	student be able to intrupt nuances of English language through audio- visual experience and group activities
					CO-2	Use Speaking skills clearly with the right accent and intonation
					CO-3	Stdent will organize Speaking skills with clarity and confidence which in turn enhances their employ ability skills
					CO-4	Able to Implement Neutralization of accent for intelligibility
					CO-5	Understand and apply knowledge of human communication and language process.
8	I/I	R-16	Basic Electrical Engineering Lab	EE108ES	CO-1	Remember an exposure to basic electrical laws.
					CO-2	Understand the response of different types of electrical circuits to different excitations.
					CO-3	Evaluate the measurement, calculation and relation between the basic electrical parameters
					CO-4	Analyze the basic characteristics of transformers and its connections
					CO-5	Differenciate the performance of different machines using different methods
9	I/II	R-16	Mathematics - II	MA201BS	CO-1	Identify whether the given differential equation of first order is exact or not. Applications of first order differential equations
					CO-2	Solve higher differential equation and apply the concept of differential equation to real world problems.
					CO-3	Evaluate the multiple integrals and apply the concepts to find areas, volumes, center of mass and gravity for cubes, sphere and rectangular parallelepiped.
					CO-4	Apply the physical quantities involved in engineering field related to vector valued functions
					CO-5	Analyze the line, surface and volume integrals and converting them from one to another.
10	I/II	R-16	Applied Physics	AP202BS	CO-1	Apply the fundamental concepts on Quantum behavior of matter in its microstate.
					CO-2	Understand the of fundamentals of Semiconductor Physics, Optoelectronics which evaluate the students to apply to various systems like communication, solar cell, photocell etc.,
					CO-3	Analyze the principle, working of various Laser systems and light propagation through Optical Fibers.
					CO-4	Design, Analyze Characterize, and study the properties of materials and to prepare new materials for various engineering applications.
					CO-5	Evaluate the Laws of Electromagnetism and get an exposure on Magnetic and Dielectric materials.
11	I/II	R-16	Programming for Problem Solving	CS203ES	CO-1	Able to formulate the algorithm for simple problem and able to translate given algorithm to working and correct program
					CO-2	Demonstrate the use of arrays,structure and pointers
					CO-3	Able to create, read and write to and append to from simple text and binary files
					CO-4	understand about the function and dynamic memory allocation and deal location
					CO-5	Apply different searching and sorting technique on array elements
12	I/II	R-16	Engineering Graphics	ME204ES	CO-1	Apply computer aided drafting tools to create 2D and 3D objects
					CO-2	sketch conics and different types of solids
					CO-3	Apply the knowledge of Sectional views of solids and Development of surfaces of solids
					CO-4	Demonstrate Read and interpret engineering drawings
					CO-5	Conversion of orthographic projection into isometric view and vice versa manually and by using computer aided drafting
13	I/II	R-16	Applied Physics Lab	AP205BS	CO-1	Understand the characteristics of Photo emitters and Photo detectors
					CO-2	Construct RC & LCR circuit in Series and parallel.
					CO-3	Study the magnetic field variation along the axis of the circular coil carrying current.
					CO-4	Understand the working of Optical fiber and find the values of Numerical Aperture and Bending Losses.
					CO-5	Find the value of Energy gap and Hall coefficient of a given semiconductor material.
14	I/II	R-16	Programming for Problem Solving Lab	CS206ES	CO-1	Translate the given algorithm to a working and correct program
					CO-2	Identify and correct logical errors encountered during execution
					CO-3	Manipulate data with arrays strings and structures
					CO-4	creatre read and write to and from simple text and binary files
					CO-5	Modularize the code with functions so that they can be reused
15	I/II	R-16	ENVIRONMENTAL SCIENCE	MC209ES	CO-1	Gain knowledge about environment and ecosystem
					CO-2	Students will learn about natural resource, its importance and environmental impacts of human activities on natural resource.
					CO-3	Gain knowledge about the conservation of biodiversity and its importance.
					CO-4	Aware students about problems of environmental pollution, its impact on human and ecosystem and control measures.

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16	II/I	R-16	ANALOG AND DIGITAL ELECTRONICS	CS301ES	CO-1	Know the characteristics of various components.
					CO-2	Understand the utilization of components.
					CO-3	Design and analyze small signal amplifier circuits
					CO-4	Design and analyze combinational and sequential circuits
					CO-5	Know about the logic families and realization of logic gates.
17	II/I	R-16	DATA STRUCTURES	CS302PC	CO-1	Ability to select the data structures that efficiently model the information in a problem.
					CO-2	Ability to assess efficiency trade-offs among different data structure implementations or combinations.
					CO-3	Implement and know the application of algorithms for sorting and pattern matching
					CO-4	Design programs using a variety of data structures, including hash tables, binary and general tree structures, search trees, tries, heaps, graphs, and AVL-trees.
					CO-5	Enhance their algorithmic thinking skills and learn how to design algorithms that leverage the strengths of specific data structures to solve problems efficiently.
18	II/I	R-16	COMPUTER ORIENTED STATISTICAL METHODS	MA303BS	CO-1	Apply the concepts of probability and distributions to some case studies
					CO-2	Correlate the material of one unit to the material in other units
					CO-3	Resolve the potential misconceptions and hazards in each topic of study
					CO-4	Develop proficiency in using computer software to perform data analysis tasks, such as data cleaning, data visualization, and descriptive statistics
					CO-5	To test hypotheses and make data-driven decisions.
19	II/I	R-16	COMPUTER ORGANIZATION AND ARCHITECTURE	CS304PC	CO-1	Understand the basics of instructions sets and their impact on processor design
					CO-2	Demonstrate an understanding of the design of the functional units of a digital computer system.
					CO-3	Evaluate cost performance and design trade-offs in designing and constructing a computer processor including memory.
					CO-4	Design a pipeline for consistent execution of instructions with minimum hazards
					CO-5	Recognize and manipulate representations of numbers stored in digital computers
20	II/I	R-16	OBJECT ORIENTED PROGRAMMING USING C++	CS305PC	CO-1	Able to develop programs with reusability
					CO-2	Develop programs for file handling
					CO-3	Handle exceptions in programming
					CO-4	Develop applications for a range of problems using object-oriented programming techniques
					CO-5	To create modular and reusable code by defining classes and using object instances.
21	II/I	R-16	ANALOG AND DIGITAL ELECTRONICS LAB	CS306ES	CO-1	Know the characteristics of various components.
					CO-2	Understand the utilization of components.
					CO-3	Design and analyze small signal amplifier circuits.
					CO-4	Postulates of Boolean algebra and to minimize combinational functions
					CO-5	Design and analyze combinational and sequential circuits

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22	II/I	R-16	DATA STRUCTURES LAB	CS307PC	CO-1	Ability to develop C programs for computing and real-life applications using basic elements like control statements, arrays, functions, pointers and strings, and data structures like stacks, queues and linked lists.
					CO-2	Ability to Implement searching and sorting algorithms
					CO-3	Proficient in implementing algorithms associated with data structures, such as sorting and searching algorithms, graph traversal, and tree traversal algorithms.
					CO-4	Will analyse the time and space complexity of their data structure implementation
					CO-5	Understand how different data structures affect the performance of various operations.
23	II/I	R-16	IT WORKSHOP LAB	CS308PC	CO-1	Become proficient in using various software tools and applications commonly used in IT,
					CO-2	Will gain practical programming skills in languages like Python, Java, C++, or other languages relevant to the IT domain.
					CO-3	Learn web development technologies like HTML, CSS, JavaScript, and frameworks like React or Angular to build interactive and responsive web applications.
					CO-4	Will learn how to design and manage databases, perform queries, and understand basic concepts like normalization and data modeling.
					CO-5	Gain hands-on experience in configuring and managing computer networks, including setting up routers, switches, and network protocols.
24	II/I	R-16	C++ PROGRAMMING LAB	CS309PC	CO-1	Ability to develop applications for a range of problems using object-oriented programming techniques
					CO-2	Become proficient in writing C++ code, understanding the syntax, and using the language's features, such as variables, data types, loops, conditionals, functions, and classes.
					CO-3	Gain experience in implementing various algorithms and data structures in C++, enabling them to solve computational problems efficiently.
					CO-4	Will enhance their problem-solving abilities, learning how to break down complex problems into manageable tasks and design effective solutions.
					CO-5	Learn and practice OOP principles in C++, including class and object creation, inheritance, polymorphism, and encapsulation.
25	II/I	R-16	GENDER SENSITIZATION	MC309	CO-1	Understand the importance of Environmental education, conservation of natural resources & understand the importance of ecosystems and biodiversity
					CO-2	Understand the pollution problems and Apply the environmental science knowledge on solid waste management, disaster management
					CO-3	Apply the environmental science knowledge to improve the resources
					CO-4	Identify the interactions and intersections of identities (e.g., gender, race, ethnicity, class, sexuality, and so on) and assess the ways in which they contribute to instances of privilege and power dynamics across cultures, space, and time. And their problems
					CO-5	
26	II/II	R-16	DISCRETE MATHEMATICS	CS401PC	CO-1	Ability to understand and construct precise mathematical proofs
					CO-2	Ability to use logic and set theory to formulate precise statements
					CO-3	Ability to analyze and solve counting problems on finite and discrete structures
					CO-4	Ability to describe and manipulate sequences
					CO-5	Ability to apply graph theory in solving computing problems

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27	II/II	R-16	BUSINESS ECONOMICS AND FINANCIAL ANALYSIS	SM402MS	CO-1	understand the various Forms of Business and the impact of economic variables on the Business
					CO-2	The Demand, Supply, Production, Cost, Market Structure, Pricing aspects are learnt
					CO-3	The Students can study the firm's financial position by analysing the Financial Statements of a Company.
					CO-4	Learn how to apply economic principles to make rational decisions in various business scenarios, considering factors like opportunity cost, marginal analysis, and cost-benefit analysis.
					CO-5	Able to analyze markets and industry trends, assess competitive forces, and make strategic business decisions based on market conditions.
28	II/II	R-16	OPERATING SYSTEMS	CS403PC	CO-1	Will be able to control access to a computer and the files that may be shared
					CO-2	Demonstrate the knowledge of the components of computer and their respective roles in computing
					CO-3	Ability to recognize and resolve user problems with standard operating environments.
					CO-4	Gain practical knowledge of how programming languages, operating systems, and architectures interact and how to use each effectively.
					CO-5	Learn about device drivers, I/O operations, interrupt handling, and how the operating system interacts with hardware devices
29	II/II	R-16	DATABASE MANAGEMENT SYSTEMS	CS404PC	CO-1	Gain knowledge of fundamentals of DBMS, database design and normal forms
					CO-2	Master the basics of SQL for retrieval and management of data.
					CO-3	Be acquainted with the basics of transaction processing and concurrency control.
					CO-4	Familiarity with database storage structures and access techniques
					CO-5	Study distributed database systems and the challenges associated with data distribution and replication.
30	II/II	R-16	JAVA PROGRAMMING	CS405PC	CO-1	Able to solve real world problems using OOP techniques
					CO-2	Able to understand the use of abstract classes.
					CO-3	Able to solve problems using java collection framework and I/o classes.
					CO-4	Able to develop multithreaded applications with synchronization.
					CO-5	Able to develop applets for web applications
31	II/II	R-16	OPERATING SYSTEMS LAB (Using UNIX/LINUX) (	CS406PC	CO-1	Simulate and implement operating system concepts such as scheduling, deadlock management, file management and memory management.
					CO-2	Able to implement C programs using Unix system calls
					CO-3	Will work with threads and understand how to create, manage, and synchronize threads in a multi-threaded environment.
					CO-4	Will experiment with different CPU scheduling algorithms, such as round-robin, priority-based, and shortest job first, and analyze their performance.
					CO-5	Perform various file system operations, including file creation, reading, writing, and deletion, while understanding the impact of different file system structures.

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32	II/II	R-16	DATABASE MANAGEMENT SYSTEMS LAB	CS407PC	CO-1	Design database schema for a given application and apply normalization
					CO-2	Acquire skills in using SQL commands for data definition and data manipulation.
					CO-3	Develop solutions for database applications using procedures, cursors and triggers
					CO-4	Learn how to design and implement databases based on specific requirements, including creating tables, defining relationships, and ensuring data integrity.
					CO-5	Become proficient in using SQL (Structured Query Language) to perform various database operations
33	II/II	R-16	JAVA PROGRAMMINGLAB	CS408PC	CO-1	Able to write programs for solving real world problems using java collection frame work
					CO-2	Able to write programs using abstract classes
					CO-3	Able to write multithreaded programs
					CO-4	Able to write GUI programs using swing controls in Java
					CO-5	Understand multithreading concepts in Java and learn how to write concurrent programs to leverage modern hardware capabilities.
34	II/II	R-16	CONSTITUTION OF INDIA	MC409	CO-1	To understand Indian Constitutional Law
					CO-2	To understand historical background of Constitutional Law
					CO-3	To learn Fundamental Rights and Duties
					CO-4	To understand differences between Parliamentary and Presidential form of Government
25	III/I	R-16	DESIGN AND ANALYSIS OF ALGORITHMS	CS501PC	CO-1	Describe different types of Algorithms
					CO-2	Estimate performance of an Algorithm
					CO-3	Compare different types of design techniques of Algorithms
					CO-4	Choose Appropriate design techniques or Algorithms for solving problems
					CO-5	Develop Algorithms for real time scenarios
36	III/I	R-16	DATA COMMUNICATION AND COMPUTER NETWORKS	CS502PC	CO-1	Define Network and its components
					CO-2	Illustrate the functionality of OSI and TCP/IP reference models
					CO-3	Compare different network layer protocols
					CO-4	Evaluate Architecture for Application layer protocols
					CO-5	Choose appropriate protocol for desired communication service
37	III/I	R-16	SOFTWARE ENGINEERING	CS503PC	CO-1	Able to define software engineering process and practices, and demonstrate various process models
					CO-2	Able to identify different types of risks in software development
					CO-3	Able to distinguish different testing strategies and it's working
					CO-4	Able to Estimate the quality of software process
					CO-5	Able to develop the SRS document for project.
38	III/I	R-16	FUNDAMENTALS OF MANAGEMENT	SM504MS	CO-1	Understand the significance of management in their profession.
					CO-2	Define and summarize the importance of planning and decision making techniques.
					CO-3	Describe the organizational structures and effective utilization of Human resources in the organization
					CO-4	Importance of leadership and motivation to reach the organizational goals
					CO-5	Define controlling and enlist its features, process and different controlling techniques

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39	III/I	R-16	IPR	MT512OE	CO-1	Able to Define different types of Intellectual Property Rights.
					CO-2	Able to Classify different Intellectual Property Rights
					CO-3	Able to Identify importance of Trademark & Copy Right Laws.
					CO-4	Able to Explain importance of Patents, Trade Secret Laws
					CO-5	Able to Create new Intellectual Properties
40	III/I	R-16	DESIGN AND ANALYSIS OF ALGORITHMS LAB	CS505PC	CO-1	Able to write programs in java to solve problems using divide and conquer strategy.
					CO-2	Able to write programs in java to solve problems on graph traversals.
					CO-3	Able to write programs in java to solve problems using backtracking strategy.
					CO-4	Able to write programs in java to solve problems using greedy techniques
					CO-5	Able to write programs in java to solve problems using dynamic programming.
41	III/I	R-16	COMPUTER NETWORKS LAB	CS506PC	CO-1	Ability to implement error detection techniques.
					CO-2	Ability to apply appropriate algorithm for finding of shortest route.
					CO-3	Ability to configure the routing table
					CO-4	Ability to understand the encryption and decryption concepts in Linux environment
					CO-5	Ability to implement client/server communication
42	III/I	R-16	SOFTWARE ENGINEERING LAB	CS507PC	CO-1	Able to Plan a software engineering process life cycle.
					CO-2	Able to elicit, analyze and specify software requirements.
					CO-3	Able to Analyze and translate a specification into a design.
					CO-4	Able to Built an SRS documents :Realize design practically, using an appropriate software engineering
					CO-5	Develop prototype model for a given case study using modern engineering tools.
43	III/I	R-16	PROFESSIONAL ETHICS	MC500HS	CO-1	The students will understand the importance of Values and Ethics in their personal lives and professional careers.
					CO-2	The students will learn the rights and responsibilities as an employee, team member and a global citizen.
					CO-3	Acquiring knowledge of various roles of Engineer In applying ethical principles at various professional levels
					CO-4	Professional Ethical values and contemporary issues.
44	III/I	R-16	COMPILER DESIGN	CS601PC	CO-1	Able to define different types of translators used in programming
					CO-2	Explain symbol table organization and role of semantic analysis in compiler design
					CO-3	Able to construct a top down and bottom up parser
					CO-4	List various code generation techniques
					CO-5	Able to design a Lexical analyzer
45	III/II	R-16	WEB TECHNOLOGIES	CS602PC	CO-1	Able to explain server side scripting and make use of PHP
					CO-2	Able to define client side scripting and make use of JavaScript and AJAX to validate at client side.
					CO-3	Able to define XML and choose appropriate parser techniques (DOM and SAX).
					CO-4	Able demonstrate Server side programming and adopt to build applications with java Servlets and JSP's.
					CO-5	Able to contrast server side scripting and Server side programming and develop database connectivity by make use of java and PHP.

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46	III/II	R-16	CRYPTOGRAPHY AND NETWORK SECURITY	CS603PC	CO-1	Understand and apply the cryptographic algorithms to safeguard from intruders
					CO-2	Compare and contrast symmetric and asymmetric encryption systems and their vulnerability to attack
					CO-3	Implement the various key distribution, management and message authentication schemes to send the messages with security
					CO-4	Identify information system requirements for Transport level, wireless network, E-Mail and IP
					CO-5	Design a network security system by implementing all the concepts of encryption and decryption algorithms
47	III/II	R-16	DESIGN PATTERNS	CS612PE	CO-1	Define the design patterns that are common in software applications.
					CO-2	Ability to interpret common design patterns to incremental or iterative development
					CO-3	Apply the core solutions to object- oriented design problems
					CO-4	Ability to analyze appropriate patterns for design of given problem
					CO-5	Design knowledge of the principles of object- oriented design problems in real world
48	III/II	R-16	Principles of Computer Communications and Networks	EC621OE	CO-1	The student can get the knowledge of networking of computers ,data transmission between computers.
					CO-2	Will have the exposure about the various communication concepts.
					CO-3	Will get awareness about the structure and equipment of computer network structures
					CO-4	Understand the concept of digital communication concepts
					CO-5	Understand the concepts of Physical and data link layer concepts.
49	III/II	R-16	CRYPTOGRAPHY AND NETWORK SECURITY LAB	CS604PC	CO-1	Use C language to develop simple XOR operation for encryption of data
					CO-2	Make use of C/Java to implement Symmetric cryptography
					CO-3	Choose C/Java to develop Asymmetric cryptography
					CO-4	Implement Diffie-Hellman Key exchange using HTML and JavaScript
					CO-5	Develop java programs on MD-5 and SHA-1 algorithms
50	III/II	R-16	WEB TECHNOLOGIES LAB	CS605PC	CO-1	Able to build a static website using HTML
					CO-2	Able to include JavaScript for validations
					CO-3	Able to use XML to store and forwarding data.
					CO-4	Students able to implement dynamic websites using PHP
					CO-5	Able to develop Web applications by using JSP with Database Connectivity.
51	III/II	R-16	ADVANCED ENGLISH COMMUNICATION SKILLS LAB	EN606HS	CO-1	Develops confidence to use relevant vocabulary, using apt kinesics or body language in communication
					CO-2	Infer the meaning of the text easily through comprehension techniques like, skimming, scanning and effective reading through proper vocabulary
					CO-3	Analyze the writing skills through letters, reports and resume writing from the text and use for all professional settings
					CO-4	Gather ideas, information and organize them relevantly in making presentations
					CO-5	Self assured to organize and deliver discussions, presentations and strategies to face the interviews effectively

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52	IV/I	R-16	DATA MINING	CS701PC	CO-1	Utilize the existing tool and perform data pre-processing
					CO-2	Ability to analyze the data and apply appropriate algorithm for decision making
					CO-3	Ability to add mining algorithms as a component to the existing tool
					CO-4	Ability to develop a system to help a loan officer to decide whether the credit of a customer is good or bad using mining algorithms
					CO-5	Ability to classify web pages, extracting knowledge from the web
53	IV/I	R-16	PRINCIPLES OF PROGRAMMING LANGUAGE	CS702PC	CO-1	Able to Explain the important features of the Programming Languages
					CO-2	Able to Compare different Programming Domains
					CO-3	Ability to Evaluate Merits and Demerits of a Particular Programming Language.
					CO-4	Able to Choose Specific Programming Language for the Development of Specific Applications
					CO-5	Able to Understand and Analyze the Importance of Implementation Process
54	IV/I	R-16	PYTHON PROGRAMMING	CS721PE	CO-1	Examine Python syntax and semantics and be fluent in the use of Python flow control and functions.
					CO-2	Demonstrate proficiency in handling Threads, File and Exceptions.
					CO-3	Create, run and manipulate Python Programs using core data structures like Lists, Dictionaries and use Regular Expressions
					CO-4	Interpret the concepts of GUI and WEB Programming as used in Python
					CO-5	Implement exemplary applications related to Database Programming with ORM in Python.
55	IV/I	R-16	SOFTWARE PROCESS AND PROJECT MANAGEMENT	CS734PE	CO-1	Able to Explain Conventional Software Management Process to Develop Software
					CO-2	Able to Identify factors for Improving Software Economics
					CO-3	Ability to find the Relationships among Different Life Cycle Phases
					CO-4	Compare and Differentiate Organization Structure and Project Structure
					CO-5	Able to Predict Metrics and forecasting guidelines for Project Cost Schedule and Quality Control
56	IV/I	R-16	BLOCK CHAIN TECHNOLOGY	CS743PE	CO-1	Learn about research advances related to one of the most popular technological areas today
					CO-2	gain a solid grasp of what blockchain technology is, how it works, and its core components such as blocks, chains, cryptographic hashing, and consensus mechanisms.
					CO-3	explore the role of cryptocurrencies (e.g., Bitcoin, Ethereum) and digital assets in blockchain ecosystems, including how transactions are validated and recorded on the blockchain.
					CO-4	understand the security features of blockchain technology, including cryptographic techniques, immutability, and protection against tampering.
					CO-5	explore various consensus algorithms (e.g., Proof of Work, Proof of Stake) that govern how transactions are verified and added to the blockchain.
57	IV/I	R-16	DATA MINING LAB	CS703PC	CO-1	Ability to explain different kinds of data warehouse tools.
					CO-2	Utilize the existing tool and perform data pre-processing.
					CO-3	Ability to analyze the data and apply appropriate algorithm for decision making
					CO-4	Ability to add mining algorithms as a component the existing tool
					CO-5	Ability to develop a system to help a loan officer to decide whether the credit of a customer is good or bad using mining algorithms

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58	IV/I	R-16	PYTHON PROGRAMMING LAB	CS751PC	CO-1	Student should be able to understand the basic concepts scripting and the contributions of scripting language
					CO-2	Examine the core data structures like lists, dictionaries, tuples and sets in Python to store, process and sort the data.
					CO-3	Identify the external modules and import specific methods form them
					CO-4	Demonstrate proficiency in handling Strings and File Systems.
					CO-5	Ability to explore python especially the object oriented concepts, and the built in objects of Python
59	IV/I	R-16	INDUSTRIAL ORIENTED MINI PROJECT	CS705PC	CO-1	Graduates will be able to identify and define problems in the area of Computer science
					CO-2	Graduates will be able to explain and illustrate their practical skills needed to understand and modify problems related to programming and designing.
					CO-3	Graduates will get a chance to apply current technologies and develop applications for the problems
					CO-4	Graduates will get opportunities to practice as teams on multidisciplinary projects with effective writing and communication skills
60	IV/I	R-16	SEMINAR	CS706PC	CO-1	The students will be able to recall existing technologies in the area of computer science
					CO-2	The students will be able to describe, compare and evaluate different technologies
					CO-3	The students will be able to decide the area of interest
					CO-4	The students will be able to develop their communication skills
61	IV/II	R-16	Management Information Systems	EE832OE	CO-1	Understand the usage of MIS in organizations and the constituents of the MIS
					CO-2	Understand the classifications of MIS, understanding of functional MIS and the different functionalities of these MIS. This would be followed by case study on Knowledge management.
					CO-3	Assess the requirement and stage in which the organization is placed. Nolan model is expected to aid such decisions
					CO-4	Learn the functions and issues at each stage of system development. Further different ways in which systems can be developed are also learnt.
					CO-5	Supports long-term planning by providing historical data, trend analysis, and forecasting.
62	IV/II	R-16	MODERN SOFTWARE ENGINEERING	CS854PE	CO-1	Learn about agile methodologies and practices, enabling them to work collaboratively, adapt to changing requirements, and deliver software in iterative cycles.
					CO-2	Become familiar with common design patterns and best practices for creating modular, maintainable, and scalable software architectures.
					CO-3	Understand the importance of writing tests before code and practice TDD principles to ensure robust and reliable software.
					CO-4	Explore container technologies like Docker and container orchestration platforms like Kubernetes, which are crucial for scalable and portable applications.
					CO-5	Learn about software security best practices, understanding how to identify and mitigate potential vulnerabilities and threats.

S. No	CLASS	REGULATION	Subject	Course Code	CO's	Course Oucomes
63	IV/II	R-16	ADVANCED ALGORITHMS	CS861PE	CO-1	Learn how to design, analyze, and implement advanced algorithms that address specific computational challenges.
					CO-2	Gain insights into optimizing algorithms for better time and space complexity, enabling them to write more efficient code
					CO-3	Explore how advanced algorithms are applied in various fields such as artificial intelligence, cryptography, network optimization, and more.
					CO-4	Enhance their coding skills by implementing complex algorithms in programming languages of their choice.
					CO-5	Encourage students to explore research topics in algorithms, leading to potential contributions and innovations in the field.
64	IV/II	R-16	MAJOR PROJECT	CS801PC	CO-1	Competence in applying the software engineering principles in planning, formulating an innovative design/ approach and computing the requirements appropriate to solve the problem within the context of legal, global and environment constraint.
					CO-2	Capability to develop/implement the design with appropriate techniques, resources and contemporary tools exhibiting integrity and ethical behavior in engineering practice.
					CO-3	Ability to plan, monitor, and manage project schedule, resources, and work assignments to ensure timely completion.
					CO-4	Ability to test and defend performance of the implemented project and understand the Implication of the solution.
					CO-5	Perform professionally as a team member, accepting responsibility, taking initiative, and providing leadership necessary to ensure Project success.
65	IV/II	R-16	CLOUD COMPUTING	CS742PE	CO-1	Explains the key dimensions of the challenge of Cloud Computing. (U)
					CO-2	Analyses the economics, financial and technological implications for selecting cloud computing for own organization. (AN)
					CO-3	Analyses the financial, technological, and organizational capacity of employer's for actively initiating and installing cloud-based applications. (AN)
					CO-4	Evaluation of own organizations' needs for capacity building and training in cloud computing-related IT areas. (E)
					CO-5	Describes about the cloud resources management and various scheduling in the cloud