

17 SCHEME

SEMSTER : III **SUBJECT CODE:** 17MAT31 **SUBJECT NAME:** Engineering Mathematics –

At the end of the course students will be able to	
CO1	Know the use of periodic signals and Fourier series to analyze circuits and system communications.
CO2	Explain the general linear system theory for continuous-time signals and digital signal processing using the Fourier Transform and z-transform.
CO3	Employ appropriate numerical methods to solve algebraic and transcendental equations.
CO4	Apply Green's Theorem, Divergence Theorem and Stokes' theorem in various applications in the field of electro-magnetic and gravitational fields and fluid flow problems.
CO5	Determine the extremals of functionals and solve the simple problems of the calculus of variations.

SEMSTER : III **SUBJECT CODE:** 17CS32 **SUBJECT NAME:** Analog and Digital Electrc

At the end of the course students will be able to	
CO1	Imitate the applications of FET and MOSFET with HDL tool.
CO2	Design and implement combinational circuits using logic gates with and without HDL tool.
CO3	To design and implement data processing circuits using logic gates with and without HDL tool.
CO4	To design and implement sequential circuits like registers and counters using flip flops with and without HDL tool.
CO5	To design and implement analog to digital & digital to analog converters with and without HDL tool.

SEMSTER : III **SUBJECT CODE:** 17CS33 **SUBJECT NAME:** Data Structures and

At the end of the course students will be able to	
CO1	Acquire knowledge about internal organization of components of computer, instruction formats and addressing modes, stacks.
CO2	Learning about the how system handles multiple I/O devices and how I/O devices are connected
CO3	Analyze what is memory hierarchy, how the performance of computer is improved using cache memory
CO4	Learn how arithmetic operations are performed using 2's complement number representation
CO5	Analyze Bus Organization, Hard-wired Control, Micro programmed Control. Embedded Systems

SEMSTER : III **SUBJECT CODE:** 17CS34 **SUBJECT NAME:** Computer Organization

At the end of the course students will be able to	
CO1	Acquire knowledge about internal organization of components of computer, instruction formats and addressing modes, stacks.
CO2	Learning about the how system handles multiple I/O devices and how I/O devices are connected

CO3	Analyze what is memory hierarchy, how the performance of computer is improved using cache memory
CO4	Learn how arithmetic operations are performed using 2's complement number representation
CO5	Analyze Bus Organization, Hard-wired Control, Micro programmed Control. Embedded Systems

SEMSTER : III SUBJECT CODE: 17CS35 SUBJECT NAME: Unix and Shell Programming	
At the end of the course students will be able to	
CO1	Understand the Unix Architecture and use of basics commands
CO2	Understand Unix file system and use of file related commands
CO3	Use of editors and Networking commands.
CO4	Write shell script using different control structures.
CO5	Understand and analyze UNIX System calls, Process Creation, Control & Relationship.

SEMSTER : III SUBJECT CODE: 17CS36 SUBJECT NAME:Discrete Mathematical Structures	
At the end of the course students will be able to	
CO1	Verify the correctness of an argument using propositional and predicate logic and truth tables.
CO2	Demonstrate the ability to solve problems using counting techniques and combinatory in the context of discrete probability.
CO3	Solve problems involving recurrence relations and generating functions.
CO4	Construct proofs using direct proof, proof by contraposition, proof by contradiction, proof by cases, and mathematical induction.
CO5	Explain and differentiate graphs and trees

SEMSTER : IV SUBJECT CODE: 17MAT41 SUBJECT NAME:Engineering Mathematics-IV	
At the end of the course students will be able to	
CO1	Solve first order ordinary differential equations arising in flow problems using single step and multistep numerical methods.
CO2	Solve second order ordinary differential equations arising in flow problems using single step and multistep numerical methods.Solve problems of quantum mechanics, hydrodynamics and heat conduction by employing Bessel's function relating to cylindrical polar coordinate systems and Legendre's
CO3	Understand the analyticity, potential fields, residues and poles of complex potentials in field theory and electromagnetic theory.Describe conformal and bilinear transformation arising in aerofoil theory, fluid flow visualization and image processing.
CO4	Solve problems on probability distributions relating to digital signal processing information theory and optimization concepts of stability of design and structural engineering. Determine joint probability distributions and stochastic matrix connected with the multivariable correlation problems for feasible random events.
CO5	Draw the validity of the hypothesis proposed for the given sampling distribution in accepting or rejecting the hypothesis.Define transition probability matrix of a Markov chain and solve problems related to discrete parameter random process

SEMSTER : IV SUBJECT CODE: 17CS42 SUBJECT NAME: Software Engineering

At the end of the course students will be able to	
CO1	Design a software system, component, or process to meet desired needs within realistic constraints. Assess professional and ethical responsibility
CO2	Use the techniques, skills, and modern engineering tools necessary for engineering practice
CO3	Analyze, design, implement, verify, validate, implement, apply, and maintain software systems or parts of software systems
CO4	Use Quality Management and Standards.
CO5	Understand the concepts of Agile Software Development

SEMSTER : IV SUBJECT CODE: 17CS43 SUBJECT NAME: Design and Analysis of Algorithm

At the end of the course students will be able to	
CO1	Analyze the efficiency of algorithms using time and space complexity theory
CO2	Describe computational solution to well- known problems like searching, sorting etc.
CO3	Describe the greedy paradigm and explain when an algorithmic design situation calls or it.
CO4	Describe the dynamic-programming paradigm and recite algorithms that employ this paradigm.
CO5	Explain basic complexity classes such as P, NP, NP-complete and NP-hard and to show membership or non-membership of a problem in these classes.

SEMSTER : IV SUBJECT CODE: 17CS44 SUBJECT NAME: Microprocessor

At the end of the course students will be able to	
CO1	Explain the architecture, operations and addressing modes of 8086 microprocessor.
CO2	Design and develop assembly language code to solve problems.
CO3	Applying the knowledge of interfacing various devices to x86 family and ARM processor
CO4	Demonstrate the design of interrupt routines for interfacing devices.
CO5	Differentiate between microprocessors and microcontrollers and ARM Processors.

SEMSTER : IV SUBJECT CODE: 17CS45 SUBJECT NAME: Object Oriented Concepts

At the end of the course students will be able to	
CO1	Learning about basics of OOCs using C++ language
CO2	Learning JDK and simple programs
CO3	Learn concepts of Inheritance, exception handling in JAVA and its packages
CO4	Write simple programs to implement threads and handling events
CO5	Develop simple GUI interfaces for a computer program to interact with users, and to understand the event-based GUI handling principles using Applets and swings.

SEMSTER : IV SUBJECT CODE: 17CS46 SUBJECT NAME: Data Communication

At the end of the course students will be able to	
CO1	Define computer network basics, networking architecture, TCP/IP and OSI reference model

CO2	Explain various techniques and modes of transmission along with different switching circuits.
CO3	Understand the different protocols and coding techniques.
CO4	Describe multichannel access protocols and IEEE 802 standards for LAN.
CO5	State the fundamentals related to IPV4 and IPV6 addressing schemes.

15 SCHEME

SEMSTER : III SUBJECT CODE: 15MAT31 SUBJECT NAME:Engineering Mathematics-III

At the end of the course students will be able to	
CO1	Know the use of periodic signals and Fourier series to analyze circuits and system communications
CO2	Explain the general linear system theory for continuous-time signals and digital signal processing using the Fourier Transform and z-transform
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SEMSTER : III SUBJECT CODE:15CS32 SUBJECT NAME:Analog and Digital Electronics

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CO2	Design and implement combinational circuits using logic gates with and without HDL tool.
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CO5	To design and implement analog to digital & digital to analog converters with and without HDL tool.

SEMSTER : III SUBJECT CODE: 15CS33 SUBJECT NAME:Data Structures and Applications

At the end of the course students will be able to	
CO1	Understand the concepts of ADT such as Arrays, Strings, Polynomial and Sparse Matrix.
CO2	Understand and Make use of Linear Data structures like stack, Queue, Lists in problem solving and Recursion problems.
CO3	Study and implementation of Linked list and its applications
CO4	Understand the Non-Linear Data structures like Trees and its Applications in problem solving.
CO5	Understand the Graphs, Sorting and Hashing techniques for real world problem solving.

SEMSTER : III SUBJECT CODE: 15CS34 SUBJECT NAME:Computer Organization

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CO1	Acquire knowledge about internal organization of components of computer, instruction formats and addressing modes, stacks.
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CO4	Describe multichannel access protocols and IEEE 802 standards for LAN.
CO5	State the fundamentals related to IPV4 and IPV6 addressing schemes.

SEMSTER : V SUBJECT CODE: 15CS51 SUBJECT NAME: Management and Entrepreneurship for IT

At the end of the course students will be able to	
CO1	Explain the structure, characteristics of management and the planning process for decision making.
CO2	Define the various roles of staff along with controlling and directing of the staff.
CO3	Describe roles and responsibilities of various entrepreneurs and implement systematic approaches in project preparation with financial support.
CO4	Explain how a project is prepared and resources are planned for the project.
CO5	Analyze the characteristics, establishment and working of SSI along with case studies.

SEMSTER : V SUBJECT CODE: 15CS52 SUBJECT NAME: Computer Networks

At the end of the course students will be able to	
CO1	Analyze the different protocols of application layer along with their services
CO2	Understand the TCP architecture and able to write the FSM for different protocols.
CO3	Identify and building the skills of subnetting and routing mechanisms.
CO4	Disseminate the Wireless and Mobile Networks covering IEEE 802.11 Standard.
CO5	Illustrate concepts of Multimedia Networking, Security and Network Management.

SEMSTER : V SUBJECT CODE: 15CS53 SUBJECT NAME: Advanced Database Management System

At the end of the course students will be able to	
CO1	Understand the basic concepts of DBMS and able to construct ER-Model
CO2	Understand and apply the relational model constraints and Queries in Relational Algebra & SQL
CO3	Develop Database Programming Skills using SQL & JDBC
CO4	Apply the concepts of Normalizations and design database which possesses no anomalies
CO5	Discuss the issues related to Transaction Management

SEMSTER : V SUBJECT CODE: 15CS54 SUBJECT NAME: Automata theory and Computability

At the end of the course students will be able to	
CO1	Acquire fundamental understanding of the core concepts in automata theory and Theory of Computation

CO2	Learn how to translate between different models of Computation (e.g., Deterministic and Non-deterministic and Software models).
CO3	Design Grammars and Automata (recognizers) for different language classes and become knowledgeable about restricted models of Computation (Regular, Context Free) and their relative powers.
CO4	Develop skills in formal reasoning and reduction of a problem to a formal model, with an emphasis on semantic precision and conciseness.
CO5	Classify a problem with respect to different models of Computation.

SEMSTER : V SUBJECT CODE: 15CS551 SUBJECT NAME: Object Oriented Modeling and Design

At the end of the course students will be able to	
CO1	Acquire fundamental understanding of the core concepts in automata theory and Theory of Computation
CO2	Learn how to translate between different models of Computation (e.g., Deterministic and Non-deterministic and Software models).
CO3	Design Grammars and Automata (recognizers) for different language classes and become knowledgeable about restricted models of Computation (Regular, Context Free) and their relative powers.
CO4	Develop skills in formal reasoning and reduction of a problem to a formal model, with an emphasis on semantic precision and conciseness.
CO5	Classify a problem with respect to different models of Computation.

SEMSTER : V SUBJECT CODE: 15CS562 SUBJECT NAME: Artificial Intelligence

At the end of the course students will be able to	
CO1	Interpret the need for advanced Java concepts like enumerations and collections in developing modular and efficient programs
CO2	Build client-server applications and TCP/IP socket programs
CO3	Utilizing the concepts of string handling and its methods in programming.
CO4	Describe how servlets fit into Java-based web application architecture
CO5	Illustrate database access and details for managing information using the JDBC API.

SEMSTER : V SUBJECT CODE: 15CS564 SUBJECT NAME: Dot Net framework for application develop

At the end of the course students will be able to	
CO1	Build applications on Visual Studio .NET platform by understanding the syntax and Semantics of C#.
CO2	Demonstrate Object Oriented Programming concepts in C# programming language.
CO3	Design custom interfaces for applications and leverage the available built-in interfaces in building complex applications.
CO4	Illustrate the use of generics and collections in C#.
CO5	Compose queries to query in-memory data and define own operator behaviour.

SEMSTER : VI SUBJECT CODE: 15CS61 SUBJECT NAME: Cryptography, Network Security and Cyber

At the end of the course students will be able to	
CO1	Discuss cryptography concepts and its mathematics background.
CO2	Design and develop simple cryptography algorithms.

CO3	Illustrate key management issues and solutions
CO4	Understand cyber security and regulations.
CO5	Describe cyber Law and ethics to be followed

SEMSTER : VI SUBJECT CODE: 15CS62 SUBJECT NAME:Computer Graphics and Visualization

At the end of the course students will be able to	
CO1	Interpret the need for computer graphics in designing Animation.
CO2	Design and implement algorithms for 2D graphics primitives and attributes.
CO3	Illustrate Geometric transformations on both 2D and 3D objects.
CO4	Apply concepts of clipping and visible surface detection in 2D and 3D viewing, and Illumination Models.
CO5	Decide suitable hardware and software for developing graphics packages using OpenGL.

SEMSTER : VI SUBJECT CODE: 15CS63 SUBJECT NAME:System Software and Compiler Design

At the end of the course students will be able to	
CO1	Understand the operations of assembler and machine instructions to convert high level language to machine native code.(K2)
CO2	Explain system software such as loaders, linkers and microprocessors.(K2)
CO3	Identify and understand different components of a compiler and their .(K2)functioning
CO4	To understand the various stages involved in the design of a compiler and to have a grasp on the syntactic and semantic structure in the compiler design. .(K2)
CO5	Determine code generation and optimization techniques for effective implementation of compilation tool. Utilize lex and yacc tools for implementing different concepts of system software.(K2)

SEMSTER : VI SUBJECT CODE: 15CS64 SUBJECT NAME:Operating Systems

At the end of the course students will be able to	
CO1	Introduce the concepts and terminology used in OS, different types of OS and process management.
CO2	Explain threading and multithreaded systems, process synchronization.
CO3	Illustrate the concept of deadlock and memory management.
CO4	Illustrate the techniques for management of disk and file system.
CO5	Realize the different concepts of OS in platform of usage through case studies.

SEMSTER : VI SUBJECT CODE: 15CS653 SUBJECT NAME:Operation Research

At the end of the course students will be able to	
CO1	Formulate linear programming problems and its graphical interpretation.
CO2	Solve linear programming problems using simplex method and its variants.
CO3	Apply duality theory and dual simplex method to solve LPP.
CO4	Solve transportation and Assignment problems into solutions.
CO5	Apply game theory concepts and explain Metaheuristics

SEMSTER : VI SUBJECT CODE: 15CS661 SUBJECT NAME:Mobile Application Development

At the end of the course students will be able to	
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CO1	Implement adaptive, responsive user interfaces that work across a wide range of devices.
CO2	Infer long running tasks and background work in Android applications
CO3	Demonstrate methods in storing, sharing and retrieving data in Android applications
CO4	Analyze performance of android applications and understand the role of permissions and security
CO5	Describe the steps involved in publishing Android application to share with the world

SEMSTER : VI SUBJECT CODE: 15CS664 SUBJECT NAME:Python Application Programming

At the end of the course students will be able to

CO1	Examine Python syntax and semantics and be fluent in the use of Python flow control and functions.
CO2	Demonstrate proficiency in handling Strings and File Systems.
CO3	Create, run and manipulate Python Programs using core data structures like Lists, Dictionaries and use Regular Expressions.
CO4	Interpret the concepts of Object-Oriented Programming as used in Python.
CO5	Implement exemplary applications related to Network Programming, Web Services and Databases in Python.

SEMSTER : VII SUBJECT CODE: 15CS71 SUBJECT NAME:Web Technology and its applications

At the end of the course students will be able to

CO1	Understand and Adapt HTML and CSS syntax and semantics to build web pages.
CO2	Design and visually format tables and forms using HTML and CSS
CO3	Build Client-Side Scripts using JavaScript and Server-Side Scripts using PHP to generate and display the contents dynamically
CO4	Illustrate the principles of object oriented development using PHP
CO5	Deploy JavaScript frameworks like jQuery and Backbone which facilitates developer to focus on core features

SEMSTER : VII SUBJECT CODE: 15CS72 SUBJECT NAME:Advanced Computer Architectures

At the end of the course students will be able to

CO1	Student is able to understand Parallelism ,computer models ,performance and applications
CO2	Students will study hardware technologies of processors
CO3	Understand the caching of different hardware devices
CO4	Able to analyze parallel and scalable architecture
CO5	Illustrate parallel programming languages

SEMSTER : VII SUBJECT CODE: 15CS73 SUBJECT NAME:Machine Learning

At the end of the course students will be able to

CO1	Identify the problems for machine learning. And select the either supervised, Unsupervised or reinforcement learning.
CO2	Classification using Decision Tree Induction
CO3	Classification using Neural Network Methods
CO4	Classification using Bayesian Classification Method

CO5	Explain theory of probability and statistics related to machine learning. Investigate concept learning, ANN, Bayes classifier, k nearest neighbour, Q learning
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SEMSTER : VII SUBJECT CODE: 15CS743 SUBJECT NAME:Information and Network Security

At the end of the course students will be able to	
CO1	Describe different UNIX and POSIX standards.
CO2	Implement primitive file operations using common API and file API.
CO3	Describe UNIX process and process control using UNIX API.
CO4	Differentiate the different signals and system calls functions.
CO5	Design and build an application/service over the UNIX operating system.

SEMSTER : VII SUBJECT CODE: 15CS744 SUBJECT NAME: UNIX AND SHELL PROGRAMMING

At the end of the course students will be able to	
CO1	Describe different UNIX and POSIX standards.
CO2	Implement primitive file operations using common API and file API.
CO3	Describe UNIX process and process control using UNIX API.
CO4	Differentiate the different signals and system calls functions.
CO5	Design and build an application/service over the UNIX operating system.

SEMSTER : VII SUBJECT CODE: 15CS754 SUBJECT NAME: Storage Area Network

At the end of the course students will be able to	
CO1	Explain storage architecture, operations of various RAIDs and the components of intelligent storage system environment
CO2	Discuss the components of FCSAN, SCSI and NAS. Analyze different storage networking technologies and virtualization
CO3	Describe the process of backup, archive, replication in classic and virtual environments and recovery in storage area networks.
CO4	Define cloud computing, business drivers for cloud computing and characteristics of cloud computing
CO5	Illustrate the security in storage infrastructure and management activities.

SEMSTER : VIII SUBJECT CODE: 15CS81 SUBJECT NAME: IoT Technology

At the end of the course students will be able to	
CO1	To Differentiate the IoT Architectures based on functionality and its applications.
CO2	To Apply communication criteria and access technologies for connecting Smart Objects.
CO3	To Apply and Optimize the Internet Protocol for IoT.
CO4	To Apply concepts of Data Analytics and Security for IoT.
CO5	To Design IoT Applications using Arduino and Rasberry Pi.

SEMSTER : VIII SUBJECT CODE: 15CS82 SUBJECT NAME: Big Data Analysis

At the end of the course students will be able to	
CO1	Understand Hadoop Distributed File system and examine MapReduce Programming
CO2	Explore Hadoop tools and manage Hadoop with Ambari
CO3	Appraise the role of Business intelligence and its applications across industries

CO4	Assess core data mining techniques for data analytics
CO5	Identify various Text Mining techniques

SEMSTER : VIII SUBJECT CODE: 15CS834 SUBJECT NAME: System Modelling and Simulation

At the end of the course students will be able to	
CO1	Explain the basic system concept and concept of Manual simulation Using Event Scheduling algorithm
CO2	Determine the different statistical and queuing models in simulation
CO3	Generate and test random number variates and apply them to develop simulation models
CO4	Construct a model for a given set of data and motivate its validity
CO5	Explain validation, verification of simulation model and analyze output data produced by a model and test validity of the model.

10 SCHEME

SEMSTER : III SUBJECT CODE:10MAT31 SUBJECT NAME:Engineering Mathematics-III

At the end of the course students will be able to	
CO1	Know the use of periodic signals and Fourier series to analyze circuits and system communications
CO2	Explain the general linear system theory for continuous-time signals and digital signal processing using the Fourier Transform and z-transform
CO3	Employ appropriate numerical methods to solve algebraic and transcendental equations
CO4	Apply Green's Theorem, Divergence Theorem and Stokes' theorem in various applications in the field of electro-magnetic and gravitational fields and fluid flow problems
CO5	Determine the external of functionals and solve the simple problems of the calculus of variations

SEMSTER : III SUBJECT CODE: 10CS32 SUBJECT NAME: Electronics Circuits

At the end of the course students will be able to	
CO1	Analyze dc circuits and relate ac models of semiconductor devices with their physical Operation. Design and analyze the basic operations of MOSFET.
CO2	Design and Analysis of Optoelectronic devices and Circuits
CO3	Know about different power amplifier circuits, their design and use in electronics and communication circuits.
CO4	Know the concept of feedback amplifier and their characteristics. Design the different oscillator circuits for various frequencies
CO5	Analyze important types of integrated circuits. Demonstrate the ability to design practical circuits that perform the desired operations

SEMSTER : III SUBJECT CODE: 10CS33 SUBJECT NAME: Logic Design

At the end of the course students will be able to

CO1	Able to describe the basics of computer organization, structure and operation of computers, performance, machine instructions, number representation, addressing techniques, generic assembly language features, simple input/output programming.
CO2	Able to expose different ways of communicating with I/O devices and standard I/O interfaces, Interrupts, DMA methods, bus protocols and standards with PCI, SCSI, and USB standards.
CO3	Able to describe the components and organization used to implement the memory, cache memory and virtual memory concepts.
CO4	Able to describe the logic design of the hardware for fixed point arithmetic and the concept of floating point number representation.

SEMSTER : III SUBJECT CODE: 10CS34 SUBJECT NAME: Discrete Mathematical Structures

At the end of the course students will be able to

CO1	To verify the correctness of an argument using propositional and predicate logic and truth tables. Techniques for construct proofs using direct proof, proof by contraposition, proof by contradiction, proof by cases.
CO2	To synthesize induction hypotheses and simple induction proofs recursive definitions. Demonstrate the ability to solve problems using counting techniques and combinatorics in the context of discrete probability. Able to use Recurrence relation of first order, second order linear homogeneous recurrence relations to solve variety of combinatorial problems.
CO3	To analyze basic knowledge gain by function and relations and apply them to solve various problems.
CO4	Able to define different terminologies of graphs and trees, formulate problems in terms of graphs and apply algorithms or theorems of graph theory to solve various graph theoretic problems.

SEMSTER : III SUBJECT CODE: 10CS35 SUBJECT NAME: Data Structures with C

At the end of the course students will be able to

CO1	Understand the concept of arrays, structures and pointers to organize and access data and apply static and dynamic methods for allocating memory to store data
CO2	Implement stacks and queues using static and dynamic arrays. Apply recursive methods in solving different types of problems
CO3	Able to use linked lists as data structure and implement different data structures using linked lists
CO4	Apply the concept of trees in solving different problems and implement binary trees, binary search trees and graphs using data structure and algorithms, understand the concept of hashing

SEMSTER : III SUBJECT CODE: 10CS36 SUBJECT NAME: Object Oriented Programming with C

At the end of the course students will be able to

CO1	Apply the fundamental knowledge of Object Oriented Programming to solve computing problems using C++.
CO2	Design and develop C++ programs using concepts of inheritance and virtual functions.

CO3	Illustrate basic input output operations in C++ using streams and files.
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SEMSTER : IV SUBJECT CODE: 10MAT41 SUBJECT NAME:Engineering Mathematics-II

At the end of the course students will be able to

CO1	Solve first and second order ordinary differential equations arising in flow problems using single step and multistep numerical methods
CO2	Solve problems of quantum mechanics, hydrodynamics and heat conduction by employing Bessel's function relating to cylindrical polar coordinate systems and Legendre's polynomials relating to spherical polar coordinate systems
CO3	Understand the analyticity, potential fields, residues and poles of complex potentials in field theory and electromagnetic theory. Describe conformal and bilinear transformation arising in aerofoil theory, fluid flow visualization and image processing.
CO4	Solve problems on probability distributions relating to digital signal processing, information theory and optimization concepts of stability of design and structural engineering. Solve joint probability distributions connected with the multivariable correlation problems for feasible random events
CO5	Draw the validity of the hypothesis proposed for the given sampling distribution in accepting or rejecting the hypothesis. Define stochastic matrix connected with the multivariable correlation problems for feasible random events and transition probability matrix of a Markov chain and solve problems related to discrete parameter random process

SEMSTER : IV SUBJECT CODE: 10CS42 SUBJECT NAME: Graph Theory and Combinatorics

At the end of the course students will be able to

CO1	Define regular graphs and path & understand to draw Euler graphs, Hamilton graphs
CO2	Differentiate between Euler graphs, Hamilton graphs
CO3	Construct a minimal spanning tree & prove the theorems on tree.
CO4	Solve problems on permutations and combinations.
CO5	Find roots polynomials for the given figure.

SEMSTER : IV SUBJECT CODE: 10CS43 SUBJECT NAME: Design and Analysis of Algorithms

At the end of the course students will be able to

CO1	Able to analyze mathematically the given complex problems and learn to apply various computation problem solving techniques and analyze the complexity of the same and learn the various fundamental data structures.
CO2	Apply and analyze divide and conquer approaches and decrease and conquer approaches in solving the problems
CO3	Able to choose the appropriate algorithmic design technique like greedy method, transform and conquer approaches and compare the efficiency of algorithms to solve the given appropriate problem.
CO4	Able to apply and analyze dynamic programming approaches
CO5	Able to apply and analyze Backtracking, Branch and bound and approximation algorithms and to solve complex problems.

SEMSTER : IV SUBJECT CODE: 10CS44 SUBJECT NAME: Unix and Shell Programming

At the end of the course students will be able to

CO1	Understand the UNIX Architecture, File systems and
CO2	Interpret UNIX command and File permission
CO3	Understand the use of editors and Networking commands and shell interpretive cycle.
CO4	Understand Shell Programming and to write shell scripts.
CO5	Understand and analyze UNIX System calls, Process Creation and to write to perl script.

SEMSTER : IV **SUBJECT CODE: 10CS45** **SUBJECT NAME: Microprocessors**

At the end of the course students will be able to

CO1	To understand the history of 8086 processor and internal architecture
CO2	To understand the instruction set of 8086 various BIOS & DOS interrupt & to write ALP for MP 8086
CO3	To understand the instruction the instruction set of memory, memory interface and i/o program using 8255.
CO4	To understand the comparison of MP and microcontroller And ARM processor architecture.
CO5	To understand the instruction set of ARM processor & to write assembly language program for ARM Architecture.

SEMSTER : IV **SUBJECT CODE: 10CS46** **SUBJECT NAME: Computer Organization**

At the end of the course students will be able to

CO1	Able to describe the basics of computer organization, structure and operation of computers, performance, machine instructions, number representation, addressing techniques, generic assembly language features, simple input/output programming.
CO2	Able to expose different ways of communicating with I/O devices and standard I/O interfaces, Interrupts, DMA methods, bus protocols and standards with PCI, SCSI, and USB standards.
CO3	Able to describe the components and organization used to implement the memory, cache memory and virtual memory concepts.
CO4	Able to describe the logic design of the hardware for fixed point arithmetic and the concept of floating point number representation.

SEMSTER : V **SUBJECT CODE: 10CS51** **SUBJECT NAME: Software Engineeri**

At the end of the course students will be able to

CO1	Explain the basic concepts of software engineering, the process models, to analyze the software requirement design and documentation and to assess the professional and ethical responsibility.
CO2	Understand the various system models and to use the object oriented design principles using UML
CO3	Understand and apply various testing methods and also the evolution and maintenance phase of software engineering.
CO4	Able to manage a project including planning, scheduling and to construct a software of high quality

CO5	Understand the various agile software development methods and agile project management.
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SEMSTER : V SUBJECT CODE: 10CS52 SUBJECT NAME: Systems Software

At the end of the course students will be able to

CO1	To be able to study & understand the machine architecture of a hypothetical machine (SIC & SIC/XE), the basic assembler function, and to describe the basic structure, design and implementation of an assembler for the machine.
CO2	To be able to study & understand the machine independent assembler features and to describe the design features of Loader & Linker.
CO3	To be able to study & describe the design features of Macro Processors, and to explain the functions and capabilities of interactive text editors and debugging systems.
CO4	To understand and describe the basic features of LEX and YACC (lexical analyzer & parser generator) tools and to write & explain lex and yacc specifications.

SEMSTER : V SUBJECT CODE: 10CS53 SUBJECT NAME: Operating Systems

At the end of the course students will be able to

CO1	Able to describe the basic organization of computer system, services an operating system provides, various ways of structuring an operating system and able to understand process & thread management.
CO2	Compare the common algorithms used for scheduling various tasks in operating systems and formulate solutions for critical section problem and able to describe deadlock.
CO3	Able to understand the mechanisms of memory management and describe file system & it's implementation.
CO4	Able to describe secondary storage structure and do the case study on Linux Operating System.

SEMSTER : V SUBJECT CODE: 10CS54 SUBJECT NAME: Database Management Systems

At the end of the course students will be able to

CO1	Apply the concepts and design database for given information system and prepare a relationship between the objects identified.
CO2	Develop database programming skills in SQL using any database.
CO3	Apply the concepts of Normalization and design database which possess a good database.
CO4	Develop application programs by considering the issues like concurrency control, serializability and security and understand the recovery process.

SEMSTER : V SUBJECT CODE: 10CS55 SUBJECT NAME: Computer Networks-I

At the end of the course students will be able to

CO1	Understanding the basics of data communications, OSI model, TCP/IP model and applying different types of Multiplexing and Data conversion feature of physical layer
CO2	Understand and apply different Switching, error detection and correction features in data communications

CO3	Insight into data link layer features like framing ,Flow control and Error control protocols, Multiple access algorithms and Ethernet standards
CO4	Understanding the architecture of cellular telephony, IPV4 and IPV6 addressing mechanism and insights into IEEE 802.11, Bluetooth towards the solving real world problems.

SEMSTER : V SUBJECT CODE: 10CS56 SUBJECT NAME: Formal Languages and Automata theory

At the end of the course students will be able to

CO1	Able to Identify and introduce formal languages and Formal models in Automata theory.
CO2	Able to understand and write regular expressions, pumping lemma for regular languages and grammars .
CO3	Able to realize and apply Pushdown Automata, Pumping Lemma for non-regular languages.
CO4	Realize and apply Turing Machine , the concept of un-decidability

SEMSTER : VI SUBJECT CODE: 10AL61 SUBJECT NAME: Management and Entrepreneurship

At the end of the course students will be able to

CO1	Understand the meaning and scope of management and to know the development of management thoughts..
CO2	Analyse the objectives of planning process and the importance of decision making of planning.
CO3	Understand the Principles of organization, Committees – Centralization Vs Decentralization and to know the meaning of directing Leadership styles and controlling.
CO4	Understand the meaning and function of Entrepreneur, the role of Entrepreneur in the economical development.
CO5	Understand the need, scope and role of SSI towards economical development and available government fund.
CO6	Understand institutional support and to know the procedures to apply them for the Preparation of project report and the feasibility analysis

SEMSTER : VI SUBJECT CODE: 10CS62 SUBJECT NAME: Unix System Programming

At the end of the course students will be able to

CO1	Explain the features of ANSI C and POSIX standards and the common characteristics of APIs.
CO2	Determine the file types and the UNIX kernel support for files.
CO3	Determine the various APIs for different file types.
CO4	Explain the concept of process creation, termination and UNIX kernel support for processes.
CO5	Explain the controlling of process, the process relationships, characteristics of daemon processes and UNIX kernel support for signals.

SEMSTER : VI SUBJECT CODE: 10CS63 SUBJECT NAME: Compiler Design

At the end of the course students will be able to

CO1	Able to understand the basics of Compilers and its phases with implementation of lexical analysis phase of compiler. Identify the application of Compilers.
CO2	Able to construct different types of parsing techniques & apply Top down parsing.
CO3	Able to construct different types of Bottom up parsing techniques & apply bottom up parsing.
CO4	Able to Understand evolution orders of Syntax Direct Translation and Syntax Directed Translation Schemes. Application of SDD.
CO5	Able to State & generate various types of Intermediate codes for different language constructs like expression, flow control and procedure.

SEMSTER : VI SUBJECT CODE: 10CS64 SUBJECT NAME: Computer Networks II

At the end of the course students will be able to

CO1	Insights into the internet backbone network architecture, switching mechanism in network and shortest path route identification algorithm in network.
CO2	Insights on algorithms for identifying the shortest path route in network and different methods for congestion control in network.
CO3	Understanding the TCP/IP Architecture and addressing mechanism in internet & insights into the different internet & multicast routing protocols, need of DHCP & NAT and knowledge on assigning mobile IP.
CO4	Insight into the application layer & different applications and Conquer the different security issues in computer network.
CO5	Understanding different methods for achieving expected QoS in network and insights on VPN, Overlay network. Understanding the different compression methods and protocols for multimedia services.
CO6	Identify the need of mobile ad hoc network & sensor network and its issues related to routing and deeper insight on different routing protocols

SEMSTER : VI SUBJECT CODE: 10CS65 SUBJECT NAME: Computer Graphics and Visualization

At the end of the course students will be able to

CO1	Understand the various methods of modeling 3D objects, its synthesis and rendering paradigms by doing a comprehensive & thorough study of basics of graphics system, its applications and GPUs
CO2	Illustrate the usage of various API's in OpenGL by solving complex problems such as Marching Squares and Sierpinski gasket
CO3	Apply various transformations on the 3D & 2D objects, should be able to animate them
CO4	Understand various classical views and to implement various synthetic views in OpenGL
CO5	Investigate light material interaction using OpenGL
CO6	Implement line and polygon clipping algorithms using OpenGL

SEMSTER : VI SUBJECT CODE: 10CS661 SUBJECT NAME: Operation Research

At the end of the course students will be able to

CO1	Able to formulate a real world problem as a linear programming model and solve using simplex methods
CO2	Able to understand the working of Big M , Two phase methods and perform post optimality analysis and learn its computer implementation.

CO3	Able to analyze the concepts of duality theory , perform sensitivity analysis and compute algorithms for Linear programming
CO4	Able to solve linear transportation and assignment problems
CO5	Able to understand the concepts and applications of game theory and decision analysis.
CO6	Able to Learn the nature of meta heuristics and related solution methodologies

SEMSTER : VII SUBJECT CODE: 10CS71 SUBJECT NAME: Object-Oriented Modeling and Design

At the end of the course students will be able to

CO1	Able to Explain the concept and terms used in Object Oriented Modeling and Design and the importance of modeling as a design technique.
CO2	Design and develop the Class, State and Implementation of Models after the process of system conception, Domain analysis.
CO3	Able to Explain System Design and Estimating System performance
CO4	Apply various design patterns and their usage to solve some design problems and to identify suitable design patterns to be applied depending on the application.

SEMSTER : VII SUBJECT CODE: 10CS72 SUBJECT NAME: Embedded Computing Systems

At the end of the course students will be able to

CO1	Design Embedded System Using UML, understand designing with microprocessors and evaluate CPU performance metrics
CO2	Understand RTOS based design and able to make choice of RTOS
CO3	Understand bus based computer systems , analysis and optimization of programs , network based embedded system design; Developing and debugging and types of files generated on cross compilation

SEMSTER : VII SUBJECT CODE: 10CS73 SUBJECT NAME: Programming the Web

At the end of the course students will be able to

CO1	Demonstrate understanding of (X)HTML(5) and CSS programming.
CO2	Create and compile advanced dynamic web projects using JAVASCRIPT
CO3	Create dynamic web pages using Perl and understand the concepts of XML for visualizing and manipulating that data
CO4	Demonstrate database applications with MySQL using PHP, Ruby technologies for the development of Internet websites

SEMSTER : VII SUBJECT CODE: 10CS74 SUBJECT NAME: Advanced Computer Architectures

At the end of the course students will be able to

CO1	To be able to describe and analyze the of performance of a computer architecture and understand design instruction pipeline.
CO2	To be able to describe challenges in parallel computing and various methods for Instruction Level Parallelism
CO3	To be able to describe multiprocessor parallelism and thread level parallelism and cache memory.
CO4	To be able to describe advanced cache optimization and static methods for Instruction level parallelism

SEMSTER : VII SUBJECT CODE: 10CS753 SUBJECT NAME:Java and J2EE

At the end of the course students will be able to

CO1	Ability to use simple data structures like arrays, object oriented programming concepts like classes, inheritance and to implement programs by applying concepts of exception handling and applets.
CO2	Able to explain the concept of multithreading, event handling and are able to implement Java programs on various concept of swings.
CO3	Implementation of client–server programs in Java by applying concepts of Servlet, JDBC and RMI.
CO4	Develop JSP applications using JSP Tags, JSP Scriptlets, JavaBeans and to implement business tier and business logic based on EJB.

SEMSTER : VII SUBJECT CODE: 10CS761 SUBJECT NAME:C# Programming and Net

At the end of the course students will be able to

CO1	Assess the shortcomings in previous technologies and to get insight .NET framework and its runtime environment
CO2	To discuss the C# language fundamentals, Object Oriented Concepts and C# class hierarchy that supported by .net framework
CO3	Design, develop and build applications in C# using .NET centric building blocks
CO4	To discuss new features that are unique to c# such as properties, indexers, delegates, events, assembly and namespaces

SEMSTER : VII SUBJECT CODE: 10CS81 SUBJECT NAME:Software Architectures

At the end of the course students will be able to

CO1	Understand the principles of software architecture, architectural best-practices used in modern software engineering.
CO2	Analyze the architecture styles and solutions and to understand the quality attributes that the software architecture must possess
CO3	Analyze the models of architectural patterns-I that include layers, pipe and filters and Blackboard architectural patterns.
CO4	Apply the software architectural design for distributed system, interactive systems and Adaptable systems to large scale software system
CO5	Understand the application of design pattern whole-part, Access control and Proxy in real time software system.
CO6	Evaluate software documents to detect problems.

SEMSTER : VII SUBJECT CODE: 10CS82 SUBJECT NAME:System Modelling and Simulation

At the end of the course students will be able to

CO1	Define basic concepts, working of simulation systems and Classify various simulation models and give practical examples for each category
CO2	Explain concept of Manual simulation Using Event Scheduling algorithm with examples
CO3	Determine the different statistical and queuing models in simulation
CO4	Construct a model for a given set of data and motivate its validity

CO5	Generate and test random number variates and apply them to develop simulation models
CO6	Explain validation, verification of simulation model and analyze output data produced by a model and test validity of the model.

SEMSTER : VII SUBJECT CODE: 10CS835 SUBJECT NAME:Information and Network Security

At the end of the course students will be able to

CO1	Able to plan and work with information security related planning and associated projects
CO2	Identify and Understand the treats in Information and network security
CO3	Learn and work with various cryptographic algorithms and associated technology
CO4	Understand and work with various secure approaches in the web(www) or Internet
CO5	Identify and examine the various key management techniques in the domain of cyber security
CO6	Understanding and work with different security tools.

SEMSTER : VII SUBJECT CODE: 10CS842 SUBJECT NAME:Software Testing

At the end of the course students will be able to

CO1	Explain fundamental concepts in software testing, including software testing objectives, process, Identifying test cases, illustrate the various unit testing Methods with examples.
CO2	Identify various methods, strategies in functional Testing.
CO3	Identify various methods, strategies in Structural Testing.
CO4	Explain various methods in Integration Testing and System Testing.
CO5	Explain Fault based Testing and various tools which can be used for automating the testing process
CO6	States and explain Process Framework, Quality process, planning, monitoring the process and Documentation.

SEMSTER : VIII SUBJECT CODE: 10CS85 SUBJECT NAME:PROJECT WORK

At the end of the course students will be able to

CO1	The students will be able to think innovatively on the development of components, products, processes or technologies in the engineering field. [K4]
CO2	The student will beable toapply knowledge gained in solving real life engineering problems. [K6]

SEMSTER : VIII SUBJECT CODE: 10CS86 SUBJECT NAME: SEMINAR

At the end of the course students will be able to

CO1	Ability to present technical papers. [K2]
CO2	Ability to learn new concepts in multidisciplinary area. [K2]