**Vision:**

To Offer Quality Education in Computer Engineering

**Mission:**

1. To impart Knowledge, develop attitude and inculcate Skills and values
2. To produce competent computer professionals to serve the needs of the society
3. To build conducive environment for learning and to carry out research in Computer Engineering

**Programme Educational Objectives (PEO's):**

**PEO1**: To develop core competencies in the field of Computer Science and Design

**PEO2**: To inculcate technical and professional skill

**PEO3**: To develop an ability for professional growth

**Program Outcomes:**

**PO1: Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

**PO2: Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

**PO3: Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

**PO4: Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

**PO5: Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

**PO6: The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice

**PO7: Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

**PO8: Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

**PO9: Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

**PO10: Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

**PO11: Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

**PO12: Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change

**Program Specific Outcomes**

Engineering Graduates will be able to:

**PSO 1:** Design product, modules, interfaces and databases for a system by providing suitable architecture

**PSO 2:** Design computer-based systems to integrate hardware, software and communication technology

**Course Outcomes:2022-23**

## SE – Sem I

### Subject 1: Discrete Mathematics (210241)

At the end of this course, Students will be able to

**CO210241.1.** Apply techniques for constructing mathematical proofs and make use of appropriate set operations, propositional logic to solve problems.

**CO210241.2**. Use functions or relation models to interpret associated relationship

**CO210241.3**. Apply basic counting techniques to solve combinatorial problem.

**CO210241.4.** Use graph concepts as a tool to visualize and solve problems

**CO210241.5.** Build minimum spanning tree for a given graph and to find prefix code for a given tree.

**CO210241.6**. Apply abstract algebra in coding theory and evaluate the algebraic structures.

### Subject 2: Data Structures and Algorithms (218242)

At the end of this course, Students will be able to

**CO218242.1** To demonstrate a detailed understanding of behaviour of data structures like array, linked list, stack, and queue by developing programs.

**CO218242.2.** To analyze and use effective and efficient data structures in solving various Computer science and design domain problems.

**CO218242.3.** To design the algorithms to solve the programming problems

**CO218242.4.** To implement various kinds of searching and sorting techniques, and know when to choose which technique

**CO218242.5** To compare different representations of linear data structures and to identify the advantages and disadvantages of each.

**CO218242.6** To use features of object oriented and structured programming as per requirements of an algorithm to implement and test it

### Subject 3: Object Oriented Programming and Lab (210243)

At the end of this course, Students will be able to

**CO210243.1** Apply Object Oriented Programming concepts to solve various computing problems

**CO210243.2** Design a class using object oriented features like inheritance, data abstraction, encapsulation, and polymorphism

**CO210243.3** Design an application using the concept of Compile time and Runtime Polymorphism

**CO210243.4** Make use of suitable methods for storing and retrieving data from files.

**CO210243.5** Design an application using generic programming and exception handling

**Subject 4: Computer Graphics (210244)**

At the end of this course, Students will be able to

**CO210244.1.** Explain basic concepts of computer graphics to generate line, circle & polygon

**CO210244.2.** Use polygon filling and polygon clipping algorithms

**CO210244.3.** Apply geometric transformations on 2D and 3D objects

**CO210244.4.** Explain illumination, color models and shading algorithms

**CO210244.5.** Design graphical applications using Curves and Fractals

**CO210244.6.** Use different techniques and tools to create animation.

**Subject 5: Logic Design and Computer Architecture (218245)**

**CO218245.1** Perform basic binary arithmetic & simplify logic expressions.

**CO218245.2** Grasp the operations of logic ICs and Implement combinational logic functions using ICs.

**CO218245.3** Comprehend the operations of basic memory cell types and Implement sequential logic functions using ICs.

**CO218245.4** Elucidate the functions & organization of various blocks of CPU.

**CO218245.5** Understand CPU instruction characteristics, enhancement features of CPU

**CO218245.6** Describe an assortment of memory types (with their characteristics) used in computer systems and basic principle of interfacing input, output device

**Subject 6: Data Structures Laboratory (210246)**

At the end of this course, Students will be able to

**CO210246.1** Use algorithms on various linear data structure using sequential organization to

solve
real life problems.

**CO210246.2** Analyze problems to apply suitable searching and sorting algorithm to various applications.

**CO210246.3** Analyze problems to use variants of linked list and solve various real life problems

**CO210246.4** Designing and implement data structures and algorithms for solving different kinds of problems.

**Subject 7: OOP and Computer Graphics Laboratory (210247)**

At the end of this course, Students will be able to

**CO210247.1** Apply Object Oriented Programming features like inheritance, data abstraction, encapsulation, and polymorphism to solve various computing problems

**CO210247.2** Make use of suitable methods for storing and retrieving data from files to develop an application

**CO210247.3** Design an application using generic programming and exception handling

**CO210247.4** Implement various algorithms for scan conversion and filling & clipping of polygon

**CO210247.5** Apply geometric transformations on 2D and 3D objects.

**CO210247.6** Design and develop graphical applications using Curves, Fractals and animation techniques

**Subject 8: Logic Design and Computer Architecture Laboratory (218248)**

At the end of this course, Students will be able to

**CO218248.1** Use logic function representation for simplification with K-Maps and design Combinational logic circuits using SSI & MSI chips.

**CO218248.2** Design Sequential Logic circuits: MOD counters using synchronous counters.

**CO218248.3** Understand the basics of simulator tool & to simulate basic blocks such as ALU & memory

**Subject 9: Soft Skills Lab (218249)**

At the end of this course, Students will be able to

**CO218249.1** Introspect about individual's goals, aspirations by evaluating one's SWOC and think creatively.

**CO218249.2** Develop effective communication skills including Listening, Reading, Writing and Speaking.

**CO218249.3** Constructively participate in group discussion, meetings and prepare and deliver presentations

**CO218249.4** Write precise briefs or reports and technical documents.

**CO218249.5** Understand professional etiquette, present oneself confidently and successfully handle personal interviews

**CO218249.5** Function effectively in multi-disciplinary and heterogeneous teams through the knowledge of teamwork, Inter-personal relationships, conflict management and leadership quality.

## SE – Sem II

**Subject 1: Engineering Mathematics – III (207003)**

At the end of this course, Students will be able to

**CO207003.1** Evaluate General solution of higher-order linear differential equation with constant

coefficient using different Methods.

**CO207003.2.** Find Fourier transform & Inverse Fourier Transform for different functions. Find

Z-Transform using Definition & properties of different sequences

**CO207003.3.** Understand the different techniques of statistical Analysis. Use of probability and

probability distribution.

**CO207003.4** Solve Algebraic and Transcendental equation and system of linear equations using numerical techniques.

**CO207003.5** Obtain interpolating polynomials, numerical differentiation and integration,

numerical solutions of ordinary differential equations used in modern scientific computing

**Subject 2: Data Structures and Files (218253)**

At the end of this course, Students will be able to

**CO218253.1** Describe the abstract properties of various data structures such as stacks, queues, lists, trees, graphs and hash tables

**CO218253.2** Identify and articulate the complexity goals and benefits of a good hashing scheme for real world applications.

**CO218253.3** Apply non-linear data structures for solving problems of various domain

**CO218253.4** Design an algorithm to solve a given problem using suitable data structure and

analyze it and determine its efficiency.

**CO218253.5** Use efficient indexing methods and multiway search techniques to store and maintain data and use different file organization techniques

**CO218253.6** Design and specify the operations of a nonlinear-based abstract data type and implement them in a high-level programming language.

**Subject 3: Operating System Design (218254)**

At the end of this course, Students will be able to

**CO218254.1** Enlist functions of OS and types of system calls

**CO218254.2** Apply process scheduling algorithms to solve a given problem

**CO218254.3** Illustrate deadlock prevention, avoidance and recovery

**CO218254.4** Explain memory management technique

**CO218254.5** Illustrate I/O and file management policies

**CO218254.6** Describe Linux process management

**Subject 4: Computer Networks (218255)**

At the end of this course, Students will be able to

**CO218255.1** Summarize fundamental concepts of Computer Networks, architectures, protocols and technologies

**CO218255.2** Illustrate the working and functions of data link layer

**CO218255.3** Analyze the working of different routing protocols and mechanisms

**CO218255.4** Implement client-server applications using sockets

**CO218255.5** Illustrate role of application layer with its protocols, client-server architectures

**CO218255.6** Comprehend the basics of Network Security

**Subject 5: Design Thinking (218256)**

At the end of this course, Students will be able to

**CO218256.1** Understand(identify) the fundamentals of Design Thinking concepts, process and Principles

**CO218256.2** Identify the methods to empathize and define the problem

**CO218256.3** Apply the ideation techniques for problem solving

**CO218256.4** Construct the prototype to evaluate a design

**CO218256.5** Identify various techniques for testing to improve the performance

**CO218256.6** Apply the Design Thinking approach and model to real world situations

**Subject 6: Data Structures and Files Laboratory (218257)**

At the end of this course, Students will be able to

**CO218257.1** Understand the ADT/libraries, hash tables and dictionary to design algorithms for a specific problem

**CO218257.2** Choose most appropriate data structures and apply algorithms for graphical solutions of the problems.

**CO218257.3** Apply and analyze nonlinear data structures to solve real world complex problems.

**CO218257.4** Apply and analyze algorithm design techniques for indexing, sorting, multi- way searching, file organization and compression

**CO218257.5** Analyze the efficiency of most appropriate data structure for creating efficient solutions for engineering design situations.

**Subject 7: Software Laboratory (218258)**

At the end of this course, Students will be able to

**Computer Network**

**CO218258.1** Develop wired LAN and configure machines with IPs and demonstrate subnet information with IP allocation mechanism

**CO218258.2** Demonstrate and analyze error control, flow control techniques and protocols

**CO218258.3** Develop network applications using socket programming

**CO218258.4** Analyze the working of different routing protocols and mechanisms

**CO218258.5** Analyze and simulate CPU scheduling, Page replacement and deadlock detection techniques to develop an application.

**CO218258.6** Demonstrate fundamental operations in shell script using UNIX commands & system calls

**Subject 8 Operating Systems**

**CO218258.1** Choose the best CPU scheduling algorithm for a given problem instance

**CO218258.2** Demonstrate inter process communication

**CO218258.3** Apply deadlock avoidance algorithm

**CO218258.4** Compare performance of page replacement algorithms

**CO218258.5** Demonstrate the fundamental UNIX commands & system calls

**Subject 9: Project Based Learning – II (210258)**

**CO210258.1** Identify the real life problem from societal need point of view

**CO210258.2** Choose and compare alternative approaches to select most feasible one

**CO210258.3** Analyze and synthesize the identified problem from technological perspective

**CO210258.4** Design the reliable and scalable solution to meet challenges

**CO210258.5** Evaluate the solution based on the criteria specified

**CO210258.6** Inculcate long life learning attitude towards the societal problems

**Subject 10: Code of Conduct (210259)**

**CO210259.1** Interpret the basic perception of profession, professional ethics, various moral and social issues, industrial standards, code of ethics and role of professional ethics in engineering field.

**CO210259.2** Analyze professional rights and responsibilities of an engineer, responsibilities of an engineer for safety and risk benefit analysis.

**CO210259.3** Identify the impact of the professional Engineering solutions in societal and Environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

**CO210259.4** Develop knowledge about various roles of engineers in variety of global issues and able to apply ethical principles to resolve situations that arise in their professional lives