Second Year of Computer Engineering (2015 Course)

210241: Discrete Mathematics

Course Objectives:

1. To use appropriate set, function and relation models to understand practical examples, and Interpret the associated operations and terminologies in context.
2. Determine number of logical possibilities of events.
3. Learn logic and proof techniques to expand mathematical maturity.
4. Formulate problems precisely, solve the problems, apply formal proof techniques, and explain the reasoning clearly.

Course Outcomes:

On completion of the course, student will be able to–

1. Solve real world problems logically using appropriate set, function, and relation models and interpret the associated operations and terminologies in context.
2. Analyze and synthesize the real world problems using discrete mathematics.

210242: Digital Electronics & Logic Design

Course Objectives:

1. To understand the functionality and design of Combinational and Sequential Circuits
2. To understand and compare the functionalities, properties and applicability of Logic Families.
3. To understand concept of programmable logic devices and ASM chart and get acquainted with design of synchronous state machines.
4. To design and implement digital circuits using VHDL.

Course Outcomes:

On completion of the course, student will be able to–

1. Realize and simplify Boolean Algebraic assignments for designing digital circuits using K-Maps.
2. Design and implement Sequential and Combinational digital circuits as per the specifications.
3. Apply the knowledge to appropriate IC as per the design specifications.
4. Design simple digital systems using VHDL.
5. Develop simple embedded system for simple real world application.

210243: Data Structures and Algorithms

Course Objectives:

1. To understand the standard and abstract data representation methods.
2. To acquaint with the structural constraints and advantages in usage of the data.
3. To understand the memory requirement for various data structures.
4. To operate on the various structured data.
5. To understand various data searching and sorting methods with pros and cons.
6. To understand various algorithmic strategies to approach the problem solution.

Course Outcomes:

On completion of the course, student will be able to–

1. To discriminate the usage of various structures in approaching the problem solution.
2. To design the algorithms to solve the programming problems.
3. To use effective and efficient data structures in solving various Computer Engineering domain problems.
4. To analyze the problems to apply suitable algorithm and data structure.
5. To use appropriate algorithmic strategy for better efficiency.

210244: Computer Organization and Architecture

Course Objectives:

1. To understand the structure, function and characteristics of computer systems.
2. To understand the design of the various functional units and components of digital computers.
3. To identify the elements of modern instructions sets and explain their impact on processor design.
4. To explain the function of each element of a memory hierarchy, identify and compare different methods for computer I/O.
5. To compare simple computer architectures and organizations based on established performance metrics.

Course Outcomes:

On completion of the course, student will be able to–

1. Demonstrate computer architecture concepts related to design of modern processors, memories and I/Os.
2. Analyze the principles of computer architecture using examples drawn from commercially available computers.
3. Evaluate various design alternatives in processor organization.

210245: Object Oriented Programming

Course Objectives:

1. To explore the principles of Object Oriented Programming (OOP).
2. To understand object-oriented concepts such as data abstraction, encapsulation,
3. inheritance, dynamic binding, and polymorphism.
4. To use the object-oriented paradigm in program design.
5. To lay a foundation for advanced programming.
6. Provide programming insight using OOP constructs.

Course Outcomes:

On completion of the course, student will be able to–

1. Analyze the strengths of object oriented programming.
2. Design and apply OOP principles for effective programming.
3. Develop programming application using object oriented programming language C++
4. Percept the utility and applicability of OOP.

207003: Engineering Mathematics III

Course Objectives:

After completing this course, student will have adequate mathematical background, conceptual clarity, computational skills and algorithm design for problem solving related to:

1. Linear differential equations of higher order applicable to Control systems, Computer vision and Robotics.
2. Transform techniques such as Fourier transform, Z-transform and applications to Image processing.
3. Statistical methods such as correlation, regression analysis and probability theory to analyze data and to make predictions applicable to machine intelligence.
4. Vector calculus necessary to analyze and design complex electrical and electronic devices as appropriate to Computer engineering.
5. Complex functions, conformal mappings and contour integration applicable to Image processing, Digital filters and Computer graphics.

Course Outcomes:

On completion of the course, student will be able to–

1. Solve higher order linear differential equation using appropriate techniques for modeling and analyzing electrical circuits.
2. Solve problems related to Fourier transform, Z-Transform and applications to Signal and Image processing.
3. Apply statistical methods like correlation, regression analysis and probability theory for analysis and prediction of a given data as applied to machine intelligence.
4. Perform vector differentiation and integration to analyze the vector fields and apply to compute line, surface and volume integrals.
5. Analyze conformal mappings, transformations and perform contour integration of complex functions required in Image processing, Digital filters and Computer graphics.

210251: Computer Graphics

Course Objectives:

1. To acquaint the learner with the basic concepts of Computer Graphics.
2. To learn the various algorithms for generating and rendering graphical figures.
3. To get familiar with mathematics behind the graphical transformations.
4. To understand and apply various methods and techniques regarding projections, animation, shading, illumination and lighting.

Course Outcomes:

On completion of the course, student will be able to–

1. Apply mathematics and logic to develop Computer programs for elementary graphic operations.
2. Develop scientific and strategic approach to solve complex problems in the domain of Computer Graphics.
3. Develop the competency to understand the concepts related to Computer Vision and Virtual reality.
4. Apply the logic to develop animation and gaming programs.

210252: Advanced Data Structures

Course Objectives:

1. To develop a logic for graphical modelling of the real life problems.
2. To suggest appropriate data structure and algorithm for graphical solutions of the problems.
3. To understand advanced data structures to solve complex problems in various domains.
4. To operate on the various structured data.
5. To build the logic to use appropriate data structure in logical and computational solutions.
6. To understand various algorithmic strategies to approach the problem solution.

Course Outcomes:

On completion of the course, student will be able to–

1. To apply appropriate advanced data structure and efficient algorithms to approach the problems of various domain.
2. To design the algorithms to solve the programming problems.
3. To use effective and efficient data structures in solving various Computer Engineering domain problems.
4. To analyze the algorithmic solutions for resource requirements and optimization.
5. To use appropriate modern tools to understand and analyze the functionalities confined to the data structure usage.

210253: Microprocessor

Course Objectives:

1. To learn the architecture and programmer‘s model of advanced processor.
2. To understand the system level features and processes of advanced processor.
3. To acquaint the learner with application instruction set and logic to build assembly language programs.
4. To understand debugging and testing techniques confined to 80386 DX.

Course Outcomes:

On completion of the course, student will be able to–

1. To apply the assembly language programming to develop small real life embedded application.
2. To understand the architecture of the advanced processor thoroughly to use the resources for programming.
3. To understand the higher processor architectures descended from 80386 architecture.

210254: Principles of Programming Languages

Course Objectives:

1. To learn principles of programming language.
2. To understand structural, computational and logical implications regarding programming languages.
3. To explore main programming paradigms.
4. To understand and apply Object Oriented Programming (OOP) principles using C++ and Java.

Course Outcomes:

On completion of the course, student will be able to–

1. To analyze the strengths and weaknesses of programming languages for effective and efficient program development.
2. To inculcate the principles underlying the programming languages enabling to learn new programming languages.
3. To grasp different programming paradigms.
4. To use the programming paradigms effectively in application development.