


 MANJARA CHARITABLE TRUST
 RAJIV GANDHI INSTITUTE OF TECHNOLOGY, MUMBAI

Department of Computer Engineering

COURSE OBJECTIVES AND COURSE OUTCOMES

SEM-III

Course code	Course Name	Objectives	Outcomes
CSC301	Applied Mathematics-III	<p>Students will try to learn:</p> <ol style="list-style-type: none"> 1.To understand the concept of complex variables, C-R equations, harmonic functions and its conjugate and mapping in complex plane. 2.To learn the complex mapping, standard mappings, cross ratios and fixed point. 3.To learn the Laplace Transform, Inverse Laplace Transform of various functions, its application and Z-transform. 4.To understand the concept of Fourier Series, its complex form and enhance the problem solving skill. 	<p>Students will be able to:</p> <ol style="list-style-type: none"> 1.Understand complex variable theory, application of harmonic conjugate to get orthogonal trajectories and analytic function. 2.Plot the image of the curve by a complex transformation from z-plane to w-plane. 3.Expand the periodic function by using Fourier series and complex form of Fourier series. 4.Understand the concept of Laplace transform and inverse Laplace transform of various functions and its application to solve ordinary differential equations. 5.Apply the concept of Z-transformation and its inverse of the given sequence. 6.Apply the concept of Correlation and Regression to the engineering problems.
CSC302	Digital Logic Design and Analysis	<p>Students will try to learn:</p> <ol style="list-style-type: none"> 1.To introduce the fundamental concepts and methods for design of digital circuits and a pre-requisite for computer organization and architecture, microprocessor 	<p>Students will be able to:</p> <ol style="list-style-type: none"> 1.To understand different number systems and their conversions. 2.To analyze and minimize Boolean expressions. 3.To design and analyze

		<p>systems.</p> <p>2.To provide the concept of designing Combinational and sequential circuits.</p> <p>3.To provide basic knowledge of how digital building blocks are described in VHDL.</p>	<p>combinational circuits.</p> <p>4. To design and analyze sequential circuits.</p> <p>5. To understand the basic concepts of VHDL.</p> <p>6. To study basics of TTL and CMOS Logic families.</p>
CSC303	Discrete Mathematics	<p>Students will try to learn:</p> <p>1.Cultivate clear thinking and creative problem solving.</p> <p>2.Thoroughly train in the construction and understanding of mathematical proofs. Exercise common mathematical arguments and proof strategies.</p> <p>3.Thoroughly prepare for the mathematical aspects of other Computer Engineering courses</p>	<p>Students will be able to:</p> <p>1.Understand the notion of mathematical thinking, mathematical proofs and to apply them in problem solving.</p> <p>2. Ability to reason logically.</p> <p>3.Ability to understand relations, Diagraph and lattice..</p> <p>4.Ability to understand use of functions, graphs and their use in programming applications.</p> <p>5. Understand use of groups and codes in Encoding-Decoding.</p> <p>6. Apply discrete structures into other computing problems such as formal specification, verification, artificial intelligence, cryptography, Data Analysis and Data Mining etc</p> <p>.</p>
CSC304	Electronic Circuits and Communication Fundamentals	<p>Students will try to learn:</p> <p>1.To develop the knowledge of semiconductor devices and circuits, and explain their use in communication applications.</p> <p>2.To inculcate circuit analysis capabilities in students.</p> <p>3.To gain knowledge in electronic devices and circuits that is useful in real life applications.</p> <p>4.To understand the fundamental concepts of electronic</p>	<p>Students will be able to:</p> <p>1.To understand the use of semiconductor devices in circuits and analyze them.</p> <p>2.To understand importance of oscillators and power amplifiers in communication system.</p> <p>3.To understand basic concepts of operational amplifier and their applications.</p> <p>4.To understand the fundamental concepts of electronic communication</p>

		communication and their use in computer applications.	5.To apply knowledge of electronic devices and circuits to communication applications. 6.To study basic concepts of information theory.
CSC305	Data Structures	<p>Students will try to learn:</p> <ol style="list-style-type: none"> 1.To teach various storage mechanisms of data. 2.To design and implement various data structures. 3.To introduce various techniques for representation of the data in the real world. 4.To teach different sorting techniques. 5.To teach different searching techniques. 	<p>Students will be able to:</p> <ol style="list-style-type: none"> 1. Students will be able to implement various linear and nonlinear data structures. 2. Students will be able to handle operations like insertion, deletion, searching and traversing on various data structures. 3. Students will be able to select appropriate sorting technique for given problem. 4. Students will be able to select appropriate searching technique for given problem. 5. Students will be able to apply the learned concepts in various domains like DBMS and Compiler Construction. 6. Students will be able to choose appropriate data structure for specified problem domain.

SEM-IV

Course code	Course Name	Objectives	Outcomes
CSC401	Applied Mathematics-IV	<p>Students will try to learn:</p> <ol style="list-style-type: none"> 1. Matrix theory, and application to find the matrix function. Present methods of computing and using Eigen values and Eigen vectors. 2. Set up and directly evaluate contour integrals Cauchy integral theorem and formula in basic and extended form. Present Taylor and Laurent series to find singularities zero and poles also presents residues theory 3. Theory of probability, Baye Theorem, Expectation and Moments and its application. 4. Probability distribution such as Binomial, Poisson and Normal distribution with their properties. 5. Sampling theory and its application for small and large sample and Optimization techniques. 	<p>Students will be able to:</p> <ol style="list-style-type: none"> 1. Students in this course will be able to apply the method of solving complex integration, computing residues & evaluate various contour integrals. 2. Demonstrate ability to manipulate matrices and compute Eigen values and Eigen vectors. 3. Apply the concept of probability distribution to the engineering problems. 4. Apply the concept of sampling theory to the engineering problems. 5. Use matrix algebra with its specific rules to solve the system of linear equation, using concept of Eigen value and Eigen vector to the engineering problems. 6. Apply the concept of Linear & Non-Linear Programming Problem to the engineering problems.
CSC402	Analysis of Algorithms	<p>Students will try to learn:</p> <ol style="list-style-type: none"> 1. To provide mathematical approach for Analysis of Algorithms 2. To solve problems using various strategies 3. To analyse strategies for solving problems not solvable in polynomial time. 	<p>Students will be able to:</p> <ol style="list-style-type: none"> 1. Analyze the running time and space complexity of algorithms. 2. Describe, apply and analyze the complexity of divide and conquer strategy. 3. Describe, apply and analyze the complexity of greedy strategy. 4. Describe, apply and analyze the complexity of dynamic programming strategy. 5. Explain and apply backtracking, branch and bound and string matching techniques to deal with some hard problems. 6. Describe the classes P, NP, and NP-Complete and be able to prove that a certain problem is NP-Complete.

CSC403	Computer Organization and Architecture	<p>Students will try to learn:</p> <ol style="list-style-type: none"> 1. To have a thorough understanding of the basic structure and operation of a digital computer. 2. To discuss in detail the operation of the arithmetic unit including the algorithms & implementation of fixed-point and floating-point addition, subtraction, multiplication & division. 3. To study the different ways of communicating with I/O devices and standard I/O interfaces. 4. To study the hierarchical memory system including cache memories and virtual memory. 	<p>Students will be able to:</p> <ol style="list-style-type: none"> 1. To describe basic structure of the computer system. 2. To demonstrate the arithmetic algorithms for solving ALU operations. 3. To describe instruction level parallelism and hazards in typical processor pipelines. 4. To describe superscalar architectures, multi-core architecture and their advantages 5. To demonstrate the memory mapping techniques. 6. To Identify various types of buses, interrupts and I/O operations in a computer system
CSC404	Computer Graphics	<p>Students will try to learn:</p> <ol style="list-style-type: none"> 1 To equip students with the fundamental knowledge and basic technical competence in the field of computer graphics. 2 To emphasize on implementation aspect of Computer Graphics Algorithms. 3 To prepare the student for advance areas like Image Processing or Computer Vision or Virtual Reality and professional avenues in the field of Computer Graphics. 	<p>Students will be able to:</p> <ol style="list-style-type: none"> 1. Understand the basic concepts of Computer Graphics. 2. Demonstrate various algorithms for scan conversion and filling of basic objects and their comparative analysis. 3. Apply geometric transformations, viewing and clipping on graphical objects. 4. Explore solid model representation techniques and projections. 5. Understand visible surface detection techniques and illumination models.
CSC405	Operating System	<p>Students will try to learn:</p> <ol style="list-style-type: none"> 1. To introduce basic concepts and functions of operating systems. 2. To understand the concept of process, thread and resource management. 3. To understand the concepts of process synchronization and deadlock. 4. To understand various Memory, I/O and File management techniques. 	<p>Students will be able to:</p> <ol style="list-style-type: none"> 1. Understand role of Operating System in terms of process, memory, file and I/O management. 2. Apply and analyse the concept of a process, thread, mutual exclusion and deadlock. 3. Evaluate performance of process scheduling algorithms and IPC. 4. Apply and analyse the concepts of memory management techniques. 5. Evaluate the performance of memory allocation and replacement techniques. 6. Apply and analyze different techniques of file and I/O management.

SEM-V

Course code	Course Name	Objectives	Outcomes
CPC501	Microprocessor	<p>Students will try to learn:</p> <ol style="list-style-type: none"> 1.To understand basic architecture of 16 bit and 32 bit microprocessors. 2. To understand interfacing of 16 bit microprocessor with memory and peripheral chips involving system design. 3. To understand techniques for faster execution of instructions and improve speed of operation and performance of microprocessors. 4. To understand RISC and CISC based microprocessors. 5. To understand concept of multi core processors. 	<p>Students will be able to:</p> <ol style="list-style-type: none"> 1. Write programs to run on 8086 microprocessor based systems. 2.Design system using memory chips and peripheral chips for 16 bit 8086 microprocessor. 3.Understand and devise techniques for faster execution of instructions, improve speed of operations and enhance performance of microprocessors. 4. Distinguish between RISC and CISC processors. 5. Understand multi core processor and its advantages.
CPC502	Operating Systems	<p>Students will try to learn:</p> <ol style="list-style-type: none"> 1.To introduce students with basic concepts of Operating System, its functions and services. 2.To familiarize the students with various views and management policies adopted by O.S. as pertaining with processes , Deadlock , memory , File and I/O operations. 3.To brief the students about functionality of various OS like Unix, Linux and Windows XP as pertaining to resource management. 4.To provide the knowledge of basic concepts towards process synchronization and related 	<p>Students will be able to:</p> <ol style="list-style-type: none"> 1.Appreciate the role of operating system as System software. 2.Compare the various algorithms and comment about performance of various algorithms used for management of memory, CPU scheduling, File handling and I/O operations. 3.Apply various concept related with Deadlock to solve problems related with Resources allocation, after checking system in Safe state or not. 4.To appreciate role of Process synchronization towards increasing throughput of system. 5.Describe the various Data Structures and algorithms used by Different Oss like Windows XP,

		issues.	Linux and Unix pertaining with Process , File , I/O management. 6. To control the behavior of OS by writing Shell scripts.
CPC503	Structured and Object Oriented Analysis and Design	<p>Students will try to learn:</p> <ol style="list-style-type: none"> 1. To learn the concept of object oriented software development process & structured approach 2. To get acquainted with UML diagram. 3. To understand structured analysis and object oriented analysis Process. 4. To get familiar with different design pattern. 	<p>Students will be able to:</p> <ol style="list-style-type: none"> 1. Understand and apply techniques to get the system requirements and present it in standard format. 2. Apply key modeling concepts to both the traditional structured approach and the object-oriented approach. 3. Construct the candidate system following design methodology
CPC504	Computer Networks	<p>Students will try to learn:</p> <ol style="list-style-type: none"> 1. To provide students with an overview of the concepts and fundamentals of data communication and computer networks 2. To familiarize with the basic taxonomy and terminology of computer networking area. 3. To experience the designing and managing of communication protocols while getting a good exposure to the TCP/IP protocol suite. 	<p>Students will be able to:</p> <ol style="list-style-type: none"> 1. Conceptualize all the OSI Layers 2. Use appropriate network tools to build network topologies 3. Install and configure an open source tool NS2 4. Test simple protocols in a laboratory scenario
CPL502	Business Communication & Ethics	<p>Students will try to learn:</p> <ol style="list-style-type: none"> 1. To inculcate in students professional and ethical attitude, effective communication skills, teamwork, skills, multidisciplinary approach and an ability to understand engineer's social responsibilities. 	<p>Students will be able to:</p> <ol style="list-style-type: none"> 1. Communicate effectively in both verbal and written form and demonstrate knowledge of professional and ethical responsibilities 2. Participate and succeed in Campus placements and

		<p>2. To provide students with an academic environment where they will be aware of the excellence, leadership and lifelong learning needed for a successful professional career.</p> <p>3. To inculcate professional ethics and codes of professional practice</p> <p>4. To prepare students for successful careers that meets the global Industrial and Corporate requirement' provide an environment for students to work on Multidisciplinary projects as part of different teams to enhance their team building capabilities like leadership, motivation, teamwork etc.</p>	<p>competitive examinations like GATE, CET.</p> <p>3. Possess entrepreneurial approach and ability for life-long learning.</p> <p>4. Have education necessary for understanding the impact of engineering solutions on Society and demonstrate awareness of contemporary issues.</p>
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SEM-VI

Course code	Course Name	Objectives	Outcomes
CPC601	System Programming Compiler Construction	<p>Students will try to learn:</p> <p>1.To help students appreciate the role and functioning of various system programs over application program</p> <p>2.To initiate an understanding of compilers in general and brief about phases of compiler.</p> <p>3.To provide a theoretical framework for optimizing the code.</p> <p>4.To familiarize and encourage the students to use various software tools for Developing System programs.</p>	<p>Students will be able to:</p> <p>1. Identify different system software</p> <p>2. Use Lex tool used for generating lexical analyzer.</p> <p>3. Write macros as and when required to increase readability and productivity</p> <p>4. Design hand written lexical analyzer</p> <p>5. Design new language structures with the help of grammars</p> <p>6. Appreciate the role of Operating System functions such as memory management as pertaining to run time storage management</p>

			<p>7.Appreciate role of Intermediate Code Generation in connection with language designing</p> <p>8.Apply optimization principles on given code</p> <p>9.Implement various parser types and use YACC.</p>
CPC602	Software Engineering	<p>Students will try to learn:</p> <p>The main objective is to introduce to the students about the product that is to be engineered and the process that provides a framework for the engineering technology.</p> <p>1.To provide knowledge of software engineering discipline.</p> <p>2.To analyze risk in software design and quality.</p> <p>3.To introduce the concept of advance software methodology.</p>	<p>Students will be able to:</p> <p>1. Students will demonstrate basic knowledge in software engineering.</p> <p>2. Students will be able to plan, design, develop and validate the software project.</p> <p>3. Students will be apply advance software methodology to create high quality WebApps.</p> <p>4.Students will have an understanding of impact of sound engineering principles.</p>
CPC603	Distributed Databases	<p>Students will try to learn:</p> <p>1.To introduce principles and foundations of distributed databases, including architecture, design issues, integrity control, query processing and optimization, transactions, and Concurrency control.</p> <p>2.To enable students to understand the difference between different database system and integrate the.</p>	<p>Students will be able to:</p> <p>1.Design and implement distributed database for enterprise application.</p> <p>2.Provides solutions for heterogeneous database</p> <p>3.Use XML for schema integration.</p>
		<p>Students will try to learn:</p> <p>1. To Conceptualize the working of human brain using ANN.</p> <p>2. To become familiar with neural networks that can learn from</p>	<p>Students will be able to:</p> <p>1. Ability to analyze and appreciate the applications which can use fuzzy logic.</p> <p>2. Ability to design inference</p>

CPC604	Mobile Communication and Computing	<p>available examples and generalize to form appropriate rules for inference systems.</p> <p>3. To introduce the ideas of fuzzy sets, fuzzy logic and use of heuristics based on human experience.</p> <p>4. To provide the mathematical background for carrying out the optimization and familiarizing genetic algorithm for seeking global optimum in self-learning situation.</p>	<p>systems.</p> <p>3. Ability to understand the difference between learning and programming and explore practical applications of Neural Networks (NN).</p> <p>4. Ability to appreciate the importance of optimizations and its use in computer engineering fields and other domains.</p> <p>5. Students would understand the efficiency of a hybrid system and how Neural Network and fuzzy logic can be hybridized to form a Neuro-fuzzy network and its various applications.</p>
CPE6012	Software Project Management		<p>Students will be able to:</p> <p>1. Learner will be able to define characteristics of a project,</p> <p>2. Learner will be able to appreciate project management principles, risk in environment and the management challenges for effective project management.</p> <p>3. Learner will be able to apply the project management principles across all phases of a project.</p> <p>4. Learner will be able to demonstrate use of tools and techniques for the management of a project plan, monitor and controlling a project schedule and budget, tracking project progress.</p>

SEM-VII

Course code	Course Name	Objectives	Outcomes
CPC701	Digital Signal Processing	<p>Students will try to learn:</p> <ol style="list-style-type: none"> 1.To learn the fundamental concepts of Digital Signal Processing. 2. To explore the properties of DFT in mathematical problem solving. 3.To illustrate FFT calculations mathematically and develop FFT based DSP algorithms. 4.To introduce DSP processor for real time signal processing application 	<p>Students will be able to:</p> <ol style="list-style-type: none"> 1. To understand the concept of DT Signal and perform signal manipulation 2. To perform analysis of DT system in time domain 3. To develop FFT flow-graph and Fast DSP Algorithms. 4. To design DSP system for Real Time Signal Processing.
CPC702	Cryptography and System Security	<p>Students will try to learn:</p> <ol style="list-style-type: none"> 1.To provide students with contemporary knowledge in Cryptography and Security. 2. To understand how crypto can be used as an effective tools in providing assurance concerning privacy and integrity of information. 3.To provide skills to design security protocols for recognize security problems. 	<p>Students will be able to:</p> <ol style="list-style-type: none"> 1.Understand the principles and practices of cryptographic techniques. 2. Understand a variety of generic security threats and vulnerabilities, and identify & analyze particular security problems for given application. 3. Appreciate the application of security techniques and technologies in solving reallife security problems in practical systems. 4.Apply appropriate security techniques to solve security problem 5. Design security protocols and methods to solve the specific security problems. 6. Familiar with current research issues and directions of security.

<p>CPC703</p>	<p>Artificial Intelligence</p>	<p>Students will try to learn:</p> <ol style="list-style-type: none"> 1. To conceptualize the basic ideas and techniques underlying the design of intelligent systems. 2. To make students understand and Explore the mechanism of mind that enable intelligent thought and action. 3. To make students understand advanced representation formalism and search techniques. 4. To make students understand how to deal with uncertain and incomplete information. 	<p>Students will be able to:</p> <ol style="list-style-type: none"> 1. Ability to develop a basic understanding of AI building blocks presented in intelligent agents. 2. Ability to choose an appropriate problem solving method and knowledge representation technique. 3. Ability to analyze the strength and weaknesses of AI approaches to knowledge– intensive problem solving. 4. Ability to design models for reasoning with uncertainty as well as the use of unreliable information. 5. Ability to design and develop the AI applications in real world scenario.
<p>CPE7025</p>	<p>Soft Computing</p>	<p>Students will try to learn:</p> <ol style="list-style-type: none"> 1. To Conceptualize the working of human brain using ANN. 2. To become familiar with neural networks that can learn from available examples and generalize to form appropriate rules for inference systems. 3. To introduce the ideas of fuzzy sets, fuzzy logic and use of heuristics based on human experience. 4. To provide the mathematical background for carrying out the optimization and familiarizing genetic algorithm for seeking global optimum in self-learning situation. 	<p>Students will be able to:</p> <ol style="list-style-type: none"> 1. Ability to analyze and appreciate the applications which can use fuzzy logic. 2. Ability to design inference systems. 3. Ability to understand the difference between learning and programming and explore practical applications of Neural Networks (NN). 4. Ability to appreciate the importance of optimizations and its use in computer engineering fields and other domains. 5. Students would understand the efficiency of a hybrid system and how Neural Network and fuzzy logic can be hybridized to form a Neuro-fuzzy network and its various applications.

SEM-VIII

Course code	Course Name	Objectives	Outcomes
CPC801	Data Warehouse and Mining	<p>Students will try to learn:</p> <ol style="list-style-type: none"> 1. To study the methodology of engineering legacy databases for data warehousing and data mining to derive business rules for decision support systems. 2. To analyze the data, identify the problems, and choose the relevant models and algorithms to apply. 	<p>Students will be able to:</p> <ol style="list-style-type: none"> 1. Enable students to understand and implement classical algorithms in data mining and data warehousing; students will be able to assess the strengths and weaknesses of the algorithms, identify the application area of algorithms, and apply them. 2. Students would learn data mining techniques as well as methods in integrating and interpreting the data sets and improving effectiveness, efficiency and quality for data analysis.
CPC802	Human Machine Interaction	<p>Students will try to learn:</p> <ol style="list-style-type: none"> 1. To stress the importance of a good interface design. 2. To understand the importance of human psychology in designing good interfaces. 3. To motivate students to apply HMI in their day – to – day activities. 4. To bring out the creativity in each student – build innovative applications that are user friendly. 5. To encourage students to indulge into research in Machine Interface Design. 	<p>Students will be able to:</p> <ol style="list-style-type: none"> 1. To design user centric interfaces. 2. To design innovative and user friendly interfaces. 3. To apply HMI in their day-to-day activities. 4. To criticise existing interface designs, and improve them. 5. To Design application for social and technical task.
		<p>Students will try to learn:</p> <ol style="list-style-type: none"> 1. To provide students with contemporary knowledge in parallel and distributed systems 2. 	<p>Students will be able to:</p> <ol style="list-style-type: none"> 1. Apply the principles and concept in analyzing and designing the parallel and distributed system 2. Reason about ways to parallelize

<p>CPC803</p>	<p>Parallel and distributed Systems</p>	<p>To equip students with skills to analyze and design parallel and distributed applications. 3. To provide master skills to measure the performance of parallel and distributed algorithms</p>	<p>problems. 3. Gain an appreciation on the challenges and opportunities faced by parallel and distributed systems. 4. Understand the middleware technologies that support distributed applications such as RPC, RMI and object based middle ware. 5. Improve the performance and reliability of distributed and parallel programs.</p>
<p>CPE8035</p>	<p>Big data Analytics</p>	<p>Students will try to learn:</p> <ol style="list-style-type: none"> 1. To provide an overview of an exciting growing field of big data analytics. 2. To introduce the tools required to manage and analyze big data like Hadoop, NoSql MapReduce. 3. To teach the fundamental techniques and principles in achieving big data analytics with scalability and streaming capability. 4. To enable students to have skills that will help them to solve complex real-world problems in for decision support. 	<p>Students will be able to:</p> <ol style="list-style-type: none"> 1. Understand the key issues in big data management and its associated applications in intelligent business and scientific computing. 2. Acquire fundamental enabling techniques and scalable algorithms like Hadoop, Map Reduce and NO SQL in big data analytics. 3. Interpret business models and scientific computing paradigms, and apply software tools for big data analytics. 4. Achieve adequate perspectives of big data analytics in various applications like recommender systems, social media applications etc.