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Shree Ramchandra College of Engineering

Computer Engineering

Third Year (2019 Pattern)

Semester 5

Course Outcomes

310241: Database Management Systems

Course Outcomes: On completion of the course, learner will be able to–

CO1	Analyze and design Database Management System using ER model
CO2	Implement database queries using database languages
CO3	Normalize the database design using normal forms
CO4	Apply Transaction Management concepts in real-time situations
CO5	Use NoSQL databases for processing unstructured data
CO6	Differentiate between Complex Data Types and analyze the use of appropriate data types

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310242: Theory of Computation

Course Outcomes: On completion of the course, learner will be able to

CO1	Understand formal language, translation logic, essentials of translation, alphabets, language representation and apply it to design Finite Automata and its variants
CO2	Construct regular expression to present regular language and understand pumping lemma for RE
CO3	Design Context Free Grammars and learn to simplify the grammar
CO4	Construct Pushdown Automaton model for the Context Free Language
CO5	Design Turing Machine for the different requirements outlined by theoretical computer science
CO6	Understand different classes of problems, classify and analyze them and study concepts of NP completeness

310243: Systems Programming and Operating System

Course Outcomes: On completion of the course, learner will be able to–

CO1	Analyze and synthesize basic System Software and its functionality.
CO2	Identify suitable data structures and Design & Implement various System Software
CO3	Compare different loading schemes and analyze the performance of linker and loader
CO4	Implement and Analyze the performance of process scheduling algorithms
CO5	Identify the mechanism to deal with deadlock and concurrency issues
CO6	Demonstrate memory organization and memory management policies

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310244: Computer Networks and Security

Course Outcomes: On completion of the course, learner will be able to–

CO1	Summarize fundamental concepts of Computer Networks, architectures, protocols and technologies
CO2	Illustrate the working and functions of data link layer
CO3	Analyze the working of different routing protocols and mechanisms
CO4	Implement client-server applications using sockets
CO5	Illustrate role of application layer with its protocols, client-server architectures
CO6	Comprehend the basics of Network Security

Elective I 310245(A): Internet of Things and Embedded Systems

Course Outcomes: On completion of the course, learner will be able to–

CO1	Understand the fundamentals and need of Embedded Systems for the Internet of Things
CO2	Apply IoT enabling technologies for developing IoT systems
CO3	Apply design methodology for designing and implementing IoT applications
CO4	Analyze IoT protocols for making IoT devices communication
CO5	Design cloud based IoT systems
CO6	Design and Develop secured IoT applications

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Elective I 310245(B): Human Computer Interface

Course Outcomes: On completion of the course, learner will be able to–

CO1	To design effective Human-Computer-Interfaces for all kinds of users
CO2	To apply and analyze the user-interface with respect to golden rules of interface
CO3	To analyze and evaluate the effectiveness of a user-interface design
CO4	To implement the interactive designs for feasible data search and retrieval
CO5	To analyze the scope of HCI in various paradigms like ubiquitous computing, virtual reality ,multi-media, World wide web related environments
CO6	To analyze and identify user models, user support, and stakeholder requirements of HCI systems

Elective I 310245(C): Distributed Systems

Course Outcomes: On completion of the course, learner will be able to–

CO1	Analyze Distributed Systems types and architectural styles
CO2	Implement communication mechanism in Distributed Systems
CO3	Implement the synchronization algorithms in Distributed System applications
CO4	Develop the components of Distributed File System
CO5	Apply replication techniques and consistency model in Distributed Systems
CO6	Build fault tolerant Distributed Systems

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Elective I 310245(D): Software Project Management

Course Outcomes: On completion of the course, learner will be able to–

CO1	Comprehend Project Management Concepts CO2: CO3: CO4: CO5: CO6:
CO2	Use various tools of Software Project Management
CO3	Schedule various activities in software projects
CO4	Track a project and manage changes
CO5	Apply Agile Project Management
CO6	Analyse staffing process for team building and decision making in Software Projects and Management

310249: Seminar and Technical Communication

Course Outcomes: On completion of the course, learner will be able to–

CO1	Analyze a latest topic of professional interest
CO2	Enhance technical writing skills
CO3	Identify an engineering problem, analyze it and propose a work plan to solve it
CO4	Communicate with professional technical presentation skills

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AC5-I: Cyber Security

Course Outcomes: On completion of the course, learner will be able to–

CO1	Understand and classify various cybercrimes
CO2	Understand how criminals plan for the cybercrimes
CO3	Apply tools and methods used in cybercrime
CO4	Analyze the examples of few case studies of cybercrimes

AC5-II: Professional Ethics and Etiquettes

Course Outcomes: On completion of the course, learner will be able to–

CO1	Summarize the principles of proper courtesy as they are practiced in the workplace
CO2	Apply proper courtesy in different professional situations
CO3	Practice and apply appropriate etiquettes in the working environment and day to day life
CO4	Build proper practices personal and business communications of Ethics and Etiquettes

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AC5 III: MOOC- Learn New Skills (Full stack Developer)

Course Outcomes: On completion of the course, learner will be able to–

CO1	Design and develop web application using frontend and backend technologies.
CO2	Design and develop dynamic and scalable web applications
CO3	Develop server side scripts
CO4	Design and develop projects applying various database techniques

AC5-IV: Engineering Economics

Course Outcomes: On completion of the course, learner will be able to–

CO1	Understand economics, the cost money and management in engineering
CO2	Analyze business economics and engineering assets evaluation
CO3	Evaluate project cost and its elements for business
CO4	Develop financial statements and make business decisions

AC5-V: Foreign Language (Japanese) Module 3

Course Outcomes: On completion of the course, learner will be able to–

CO1	Apply language to communicate confidently and clearly in the Japanese language
CO2	Understand and use Japanese script to read and write
CO3	Apply knowledge for next advance level reading, writing and listening skills
CO4	Develop interest to pursue further study, work and leisure

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Semester 6

310251: Data Science and Big Data Analytics

Course Outcomes: On completion of the course, learner will be able to–

CO1	Analyze needs and challenges for Data Science Big Data Analytics
CO2	Apply statistics for Big Data Analytics
CO3	Apply the lifecycle of Big Data analytics to real world problems
CO4	Implement Big Data Analytics using Python programming
CO5	Implement data visualization using visualization tools in Python programming
CO6	Design and implement Big Databases using the Hadoop ecosystem

310252: Web Technology

Course Outcomes: On completion of the course, learners should be able to

CO1	Implement and analyze behavior of web pages using HTML and CSS
CO2	Apply the client side technologies for web development
CO3	Analyze the concepts of Servlet and JSP
CO4	Analyze the Web services and frameworks
CO5	Apply the server side technologies for web development
CO6	Create the effective web applications for business functionalities using latest web development platforms

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310253: Artificial Intelligence

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

CO1	Identify and apply suitable Intelligent agents for various AI applications CO2: CO3: CO4: CO5 CO6:
CO2	Build smart system using different informed search / uninformed search or heuristic approaches
CO3	Identify knowledge associated and represent it by ontological engineering to plan a strategy to solve given problem
CO4	Apply the suitable algorithms to solve AI problems
CO5	Implement ideas underlying modern logical inference systems
CO6	Represent complex problems with expressive yet carefully constrained language of representation

Elective II 310254(A): Information Security

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

CO1	Model the cyber security threats and apply formal procedures to defend the attacks
CO2	Apply appropriate cryptographic techniques by learning symmetric and asymmetric key cryptography
CO3	Design and analyze web security solutions by deploying various cryptographic techniques along with data integrity algorithms
CO4	Identify and Evaluate Information Security threats and vulnerabilities in Information systems and apply security measures to real time scenarios
CO5	Demonstrate the use of standards and cyber laws to enhance Information Security in the development process and infrastructure protection

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Elective II 310254(B): Augmented and Virtual Reality

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

CO1	Understand the basics of Augmented and Virtual reality systems and list their applications
CO2	Describe interface to the Virtual World with the help of input and output devices
CO3	Explain representation and rendering system in the context of Virtual Reality
CO4	Analyze manipulation, navigation and interaction of elements in the virtual world
CO5	Summarize the basic concepts and hardware of Augmented Reality system
CO6	Create Mobile Augmented Reality using Augmented Reality techniques and software

Elective II 310254(C): Cloud Computing

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

CO1	Understand the different Cloud Computing environment
CO2	Use appropriate data storage technique on Cloud, based on Cloud application
CO3	Analyze virtualization technology and install virtualization software
CO4	Develop and deploy applications on Cloud
CO5	Apply security in cloud applications
CO6	Use advance techniques in Cloud Computing

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Elective II 310254(D): Software Modelling and Architecture

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

CO1	Analyze the problem statement (SRS) and choose proper design technique for designing web-based/ desktop application
CO2	Design and analyze an application using UML modeling as fundamental tool
CO3	Evaluate software architectures
CO4	Use appropriate architectural styles and software design patterns
CO5	Apply appropriate modern tool for designing and modeling

310255: Internship**

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

CO1	To demonstrate professional competence through industry internship.
CO2	To apply knowledge gained through internships to complete academic activities in a professional manner.
CO3	To choose appropriate technology and tools to solve given problem.
CO4	To demonstrate abilities of a responsible professional and use ethical practices in day to day life.
CO5	Creating network and social circle, and developing relationships with industry people.
CO6	To analyze various career opportunities and decide carrier goals.

AC6-I Digital and Social Media Marketing

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

CO1	Understand the fundamentals and importance of digital marketing
CO2	Use the power of social media for business marketing
CO3	Analyze the effectiveness of digital marketing and social media over traditional process

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AC6-II Sustainable Energy

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

CO1	Comprehend the importance of Sustainable Energy Systems
CO2	Correlate the human population growth and its trend to the natural resource degradation and develop the awareness about his/her role towards Sustainable Energy Systems protection
CO3	Identify different types of natural resource pollution and control measures
CO4	Correlate the exploitation and utilization of conventional and non-conventional resources

AC6-III Leadership and Personality Development

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

CO1	Express effectively through communication and improve listening skills people skills and leadership qualitieS
CO2	Develop effective team leadership abilities.
CO3	Explore self-motivation and practicing creative/new age thinking.
CO4	Operate effectively in heterogeneous teams through the knowledge of team work,

AC6-IV Foreign Language (Japanese) Module 4

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

CO1	Have the ability to communicate confidently and clearly in the Japanese language
CO2	Understand the nature of Japanese script
CO3	Get introduced to reading, writing and listening skills
CO4	Develop interest to pursue further study, work and leisure

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1. Program Outcomes (PO) Learners are expected to know and be able to–

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.

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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 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

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PO10	**Communication Skills** 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 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.

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Computer Engineering

Second Year (2019 Pattern)

Semester 1

Course Outcomes

210241: Discrete Mathematics

Course Outcomes: On completion of the course, learner will be able to–

CO1	Design and analyze real world engineering problems by applying set theory, propositional logic and mathematical induction
CO2	Develop skill in expressing mathematical properties of relation and function
CO3	Identify number of logical possibilities of events to design professional engineering Solutions
CO4	Model and solve computing problem using tree and graph Analyze the properties of binary operations and evaluate the algebraic structure
CO5	Apply abstract algebra in combinatorics, coding theory and questions regarding geometric constructions

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210242: Fundamentals of Data Structures

Course Outcomes: On completion of the course, learner will be able to

CO1	To demonstrate a detailed understanding of behavior of data structures like array, linked list, stack, and queue by developing programs.
CO2	To use appropriate algorithmic strategy for better efficiency
CO3	To summarize data searching and sorting techniques.
CO4	To discriminate the usage of various structures in approaching the problem solution.
CO5	To analyze and use effective and efficient data structures in solving various Computer Engineering domain problems.
CO6	To design the algorithms to solve the programming problems

210243: Object Oriented Programming

Course Outcomes: On completion of the course, learner will be able to–

CO1	Analyze the strengths of object oriented programming
CO2	Design and apply OOP principles for effective programming
CO3	Develop the application using object oriented programming language(C++)
CO4	Apply object-oriented concepts for advanced programming.

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210244: Computer Graphics

Course Outcomes: On completion of the course, learner will be able to–

CO1	Define basic terminologies of Computer Graphics, interpret the mathematical foundation of the concepts of computer graphics and apply mathematics to develop Computer programs for elementary graphic operations.
CO2	Define the concept of windowing and clipping and apply various algorithms to fill and clip polygons.
CO3	Explain the core concepts of computer graphics, including transformation in two and three dimensions, viewing and projection.
CO4	Explain the concepts of color models, lighting, shading models and hidden surface elimination.
CO5	Describe the fundamentals of curves, fractals, animation and gaming.

210245: Digital Electronics and Logic Design

Course Outcomes: On completion of the course, learner will be able to–

CO1	Simplify Boolean Expressions using K Map.
CO2	Design and implement combinational circuits.
CO3	Design and implement sequential circuits.
CO4	Develop simple real-world application using ASM and PLD.
CO5	Choose appropriate logic families IC packages as per the given design specifications.
CO6	Explain organization and architecture of computer system

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210246: Humanity & Social Science

Course Outcomes: On completion of the course, learner will be able to–

CO1	Aware of the various issues concerning humans and society.
CO2	Aware about their responsibilities towards society.
CO3	Sensitized about broader issues regarding the social, cultural, economic and human aspects, involved in social changes.
CO4	Able to understand the nature of the individual and the relationship between self and the community.
CO5	Able to understand major ideas, values, beliefs, and experiences that have shaped human history and cultures.

AC3-I:Green Construction And Design

Course Outcomes: On completion of the course, learner will be able to–

CO1	**Understand** the importance of environment friendly society.
CO2	**Apply** primary measures to reduce carbon emissions from their surroundings.
CO3	**Learn** role of IT solutions in design of green buildings.
CO4	**Understand** the use of software systems to complete statutory compliances involved in thedesign of a new home or office building through green construction.
CO5	Able to understand major ideas, values, beliefs, and experiences that have shaped human history and cultures.

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AC3-II: Social Awareness and Governance Program

Course Outcomes: On completion of the course, learner will be able to–

CO1	Understand social issues and responsibilities as member of society.
CO2	Apply social values and ethics in decision making at social or organizational level
CO3	Promote obstacles in national integration and role of youth for National Integration
CO4	Demonstrate basic features of Indian Constitution.

AC3-III: Environmental Studies

Course Outcomes: On completion of the course, learner will be able to–

CO1	Comprehend the importance of ecosystem and biodiversity
CO2	Correlate the human population growth and its trend to the environmental degradation and develop the awareness about his/her role towards environmental protection and prevention
CO3	Identify different types of environmental pollution and control measures
CO4	Correlate the exploitation and utilization of conventional and non-conventional resources

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AC3-IV: Smart Cities

Course Outcomes: On completion of the course, learner will be able to–

CO1	Understand the dynamic behavior of the urban system by going beyond the physicalappearance and by focusing on representations, properties and impact factors
CO2	Explore the city as the most complex human-made organism with a metabolism that canbe modeled in terms of stocks and flows
CO3	Knowledge about data-informed approaches for the development of the future city,based on crowd sourcing and sensing
CO4	Knowledge about the latest research results in for the development and management offuture cities
CO5	Understand how citizens can benefit from data-informed design to develop smart andresponsive cities

AC3-V: Foreign Language- Japanese (Module 1)

Course Outcomes: On completion of the course, learner will be able to–

CO1	Will have ability of basic communication.
CO2	Will have the knowledge Japanes script.
CO3	Will get introduced to reading , writing and listening skills
CO4	Will develop interest to pursue professional Japanese Language course.

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Semester 2

210253: Data Structures & Algorithms

Course Outcomes: On completion of the course, learner will be able to–

CO1	To identify & articulate the complexity goals and benefits of a good hashing scheme for realworld applications.
CO2	To apply non-linear data structures for solving problems of various domain.
CO3	To design and specify the operations of a nonlinear-based abstract data type and implement them in a high-level programming language.
CO4	To analyze the algorithmic solutions for resource requirements and optimization
CO5	To use efficient indexing methods and multiway search techniques to store and maintain data.
CO6	To use appropriate modern tools to understand and analyze the functionalities confined to the secondary storage.

210254: Software Engineering

Course Outcomes:

CO1	Apply software engineering principles to develop software.
CO2	Analyze software requirements and formulate design solution for software.
CO3	Explain concepts of project estimation, planning and scheduling
CO4	Explain risk management and software configuration management.
CO5	Explain various types of software testing.

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210255: Microprocessor

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

CO1	To apply the assembly language programming to develop small real life embedded application.
CO2	To understand the architecture of the advanced processor thoroughly to use the resources for programming
CO3	To understand the higher processor architectures descended from 80386 architecture

210256: Principles of Programming Languages

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

CO1	Make use of basic principles of programming languages
CO2	Able to develop a program with Data representation and Computations
CO3	Able to develop programs using Object Oriented Programming language : Java
CO4	Develop application using inheritance, encapsulation, and polymorphism
CO5	Able to demonstrate Applet and Multithreading for robust application development
CO6	Able to develop a simple program using basic concepts of Functional and Logical programming paradigm

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AC4-I: Water Management

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

CO1	Understand the global water cycle and its various processes
CO2	Understand climate change and their effects on water systems
CO3	Understand Drinking treatment and quality of groundwater and surface water
CO4	Understand the Physical, chemical, and biological processes involved in water treatment and distribution.

AC4-II: Intellectual Property Rights and Patents

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

CO1	Understand the fundamental legal principles related to confidential information,copyright, patents, designs, trademarks and unfair competition
CO2	Identify, apply and assess principles of law relating to each of these areas of intellectual property
CO3	Apply the appropriate ownership rules to intellectual property you have been involvedin creating

AC4-III: The Science of Happiness

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

CO1	Understand what happiness is and why it matters to you
CO2	Learn how to increase your own happiness
CO3	Understand of the power of social connections and the science of empathy
CO4	Understand what is mindfulness and its real world applications

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AC4-IV: Yoga and Meditation

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

CO1	Understand philosophy and religion as well as daily life issues will be challenged andenhanced.
CO2	Enhances the immune system.
CO3	Intellectual and philosophical understanding of the theory of yoga and basic relatedHindu scriptures will be developed.
CO4	Powers of concentration, focus, and awareness will be heightened.

AC4-V: Foreign Language (Japanese) Module 2

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

CO1	have ability of basic communication.
CO2	have the knowledge of Japanese script.
CO3	get introduced to reading , writing and listening skills develop interest to pursue professional Japanese Language course

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SRES'S

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1. Program Outcomes (PO) Learners are expected to know and be able to–

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

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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

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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 Skills** 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.

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Computer Engineering

Fourth Year of Computer Engineering (2015 Course)

Semester 1

Course Outcomes

410241 : High Performance Computing

CO1	Describe different parallel architectures, inter-connect networks, programming models
CO2	Develop an efficient parallel algorithm to solve given problem
CO3	Analyze and measure performance of modern parallel computing systems
CO4	Build the logic to parallelize the programming task

410242: Artificial Intelligence and Robotics

CO1	Identify and apply suitable Intelligent agents for various AI applications
CO2	Design smart system using different informed search / uninformed search or heuristic approaches.
CO3	Identify knowledge associated and represent it by ontological engineering to plan a strategy to solve given problem
CO4	Apply the suitable algorithms to solve AI problems

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410243: Data Analytics

CO1	Write case studies in Business Analytic and Intelligence using mathematical models
CO2	Present a survey on applications for Business Analytic and Intelligence
CO3	Provide problem solutions for multi-core or distributed, concurrent/Parallel environments
CO4	

Elective I

410244(A): Digital Signal Processing

CO1	Understand the mathematical models and representations of DT Signals and Systems
CO2	Apply different transforms like Fourier and Z-Transform from applications point of view
CO3	Understand the design and implementation of DT systems as DT filters with filter structures and different transforms.
CO4	Demonstrate the knowledge of signals and systems for design and analysis of systems
CO5	Apply knowledge and use the signal transforms for digital processing applications

410244(B): Software Architecture and Design

CO1	Express the analysis and design of an application
CO2	Specify functional semantics of an application
CO3	Evaluate software architectures
CO4	Select and use appropriate architectural styles and software design patterns

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410244(C): Pervasive and Ubiquitous Computing

CO1	Design and implement primitive pervasive applications
CO2	Analyze and estimate the impact of pervasive computing on future computing applications and society
CO3	Develop skill sets to propose solutions for problems related to pervasive computing system
CO4	Design a preliminary system to meet desired needs within the constraints of a particular problem space

410244(D): Data Mining and Warehousing

CO1	Apply basic, intermediate and advanced techniques to mine the data
CO2	Analyze the output generated by the process of data mining
CO3	Explore the hidden patterns in the data
CO4	Optimize the mining process by choosing best data mining technique

Elective II

410245(A): Distributed Systems

CO1	Able to learn and apply the concept of remote method invocation and Remote Procedure Calls
CO2	Able to analyze the mechanism of peer to peer systems and Distributed File Systems
CO3	Demonstrate an understanding of the challenges faced by current and future distributed systems

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410245(B): Software Testing and Quality Assurance

CO1	Describe fundamental concepts in software testing such as manual testing, automation testing and software quality assurance.
CO2	Design and develop project test plan, design test cases, test data, and conduct test operations
CO3	Apply recent automation tool for various software testing for testing software
CO4	Apply different approaches of quality management, assurance, and quality standard to software system
CO5	Apply and analyze effectiveness Software Quality Tools

410245(C): Operations Research

CO1	Identify the characteristics of different types of decision-making environments
CO2	Use appropriate decision making approaches and tools
CO3	Build various dynamic and adaptive models
CO4	Develop critical thinking and objective analysis of decision problems
CO5	Apply the OR techniques for efficacy

410245(D): Mobile Communication

CO1	Justify the Mobile Network performance parameters and design decisions.
CO2	Choose the modulation technique for setting up mobile network.
CO3	Formulate GSM/CDMA mobile network layout considering futuristic requirements which conforms to the technology.
CO4	Use the 3G/4G technology based network with bandwidth capacity planning.
CO5	Percept to the requirements of next generation mobile network and mobile applications.

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Semester 2

Course Outcomes

410250 : Machine Learning

CO1	Distinguish different learning based applications
CO2	Apply different preprocessing methods to prepare training data set for machine learning.
CO3	Design and implement supervised and unsupervised machine learning algorithm.
CO4	Implement different learning models
CO5	Learn Meta classifiers and deep learning concepts

410251 : Information and Cyber Security

CO1	Gauge the security protections and limitations provided by today's technology.
CO2	Identify information security and cyber security threats.
CO3	Analyze threats in order to protect or defend it in cyberspace from cyber-attacks
CO4	Build appropriate security solutions against cyber-attacks.

Elective I

410252(A) : Advanced Digital Signal Processing

CO1	Understand and apply different transforms for the design of DT/Digital systems
CO2	Explore the knowledge of adaptive filtering and Multi-rate DSP
CO3	Design DT systems in the field/area of adaptive filtering, spectral estimation and multi-rate DSP
CO4	Explore use of DCT and WT in speech and image processing
CO5	Develop algorithms in the field of speech , image processing and other DSP applications

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410252(B) : Compliers

CO1	Design and implement a lexical analyzer and a syntax analyzer
CO2	Specify appropriate translations to generate intermediate code for the given programming language construct
CO3	Compare and contrast different storage management schemes
CO4	Identify sources for code optimization

410252(C) : Embedded and Real Time Operating System

CO1	Design and implement a lexical analyzer and a syntax analyzer
CO2	Specify appropriate translations to generate intermediate code for the given programming language construct
CO3	Compare and contrast different storage management schemes
CO4	Identify sources for code optimization

410252(D) : Soft Computing and Optimization Algorithms

CO1	Apply soft computing methodologies, including artificial neural networks, fuzzy sets, fuzzy logic, fuzzy inference systems and genetic algorithms
CO2	Design and development of certain scientific and commercial application using computational neural network models, fuzzy models, fuzzy clustering applications and genetic algorithms in specified applications.

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Elective II

410253(A) : Software Defined Networks

CO1	Interpret the need of Software Defined Networking solutions.
CO2	Analyze different methodologies for sustainable Software Defined Networking solutions.
CO3	Select best practices for design, deploy and troubleshoot of next generation networks.
CO4	Develop programmability of network elements.
CO5	Demonstrate virtualization and SDN Controllers using OpenFlow protocol

410253(B) : Human Computer Interface

CO1	Evaluate the basics of human and computational abilities and limitations.
CO2	Inculcate basic theory, tools and techniques in HCI.
CO3	Apply the fundamental aspects of designing and evaluating interfaces
CO4	Apply appropriate HCI techniques to design systems that are usable by people

410253(C) : Cloud Computing

CO1	To install cloud computing environments.
CO2	To develop any one type of cloud
CO3	To explore future trends of cloud computing

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