SRES'S

Shree Ramchandra College of Engineering

AI &DS Engineering

Course Outcomes

Second Year Engineering

Sem-I

Course code and Name: 210241- Discrete Mathematics

CO1	**Formulate** problems precisely, solve the problems, apply formal proof techniques, and explain the reasoning clearly.
CO2	**Apply** appropriate mathematical concepts and skills to solve problems in both familiar and unfamiliar situations including those in real-life contexts.
CO3	**Design and analyze** real world engineering problems by applying set theory, propositionallogic and to construct proofs using mathematical induction.
CO4	**Specify, manipulate and apply** equivalence relations; construct and use functions and applythese concepts to solve new problems.
CO5	**Calculate** numbers of possible outcomes using permutations and combinations; to model and analyze computational processes using combinatory.
CO6	**Model and solve** computing problem using tree and graph and solve problems using appropriate algorithms.
CO7	**Analyze** the properties of binary operations, apply abstract algebra in coding theory and evaluate the algebraic structures.

Course code and Name: 210242- Fundamentals of Data Structures

CO1	**Design** the algorithms to solve the programming problems, **identify** appropriate algorithmic strategy for specific application, and **analyze** the time and space complexity.

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CO2	**Illustrate** the need of information systems in global business and ethical issues.
CO3	**List** the IT infrastructure components and **explain** security in the Information System.
CO4	**Demonstrate** the importance of project management and **extend** its use in the internationa information system.
CO5	**Illustrate** the concepts of decision support systems for business applications.
CO6	**Relate** artificial intelligence and data science for Management Information System.

Course Code and Name 217531 : Internet of Things Laboratory

CO1	Understand IOT Application Development using Raspberry Pi/ Beagle board/ Arduino board
CO2	Develop and modify the code for various sensor based applications using wireless sensor modules and working with a variety of modules like environmental modules.
CO3	Make use of Cloud platform to upload and analyse any sensor data

Course Code and Name: 217532 : Data Structures and Algorithms Laboratory

CO1	**Understand** the ADT/libraries, hash tables and dictionary to design algorithms for aspecific problem.
CO2	Choose most appropriate data structures and **apply** algorithms for graphical solutions of the problems.
CO3	**Apply** and **analyze** non linear data structures to solve real world complex problems
CO4	**Apply** and **analyze** algorithm design techniques for indexing, sorting, multi-waysearching, file organization and compression.
CO5	**Analyze** the efficiency of most appropriate data structure for creating efficientsolutions for engineering design situations.

Course Code and Name: 217533 : Project Based Learning II

CO1	Identify the real life problem from societal need point of view
CO2	Choose and compare alternative approaches to select most feasible one
CO3	Analyze and synthesize the identified problem from technological perspective

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CO6	**Create** effective programs using concepts of curves, fractals, animation and gaming.
Course Code and Name: 217521 - **Operating Systems**	
CO1	**Enlist** functions of OS and types of system calls
CO2	**Apply** process scheduling algorithms to solve a given problem
CO3	**Illustrate** deadlock prevention, avoidance and recovery
CO4	Explain memory management technique CO5: Illustrate I/O and file management policiesCO6: Describe Linux process management
Course Code and Name: 217522 - Data Structures Laboratory	
CO1	**Use** algorithms on various linear data structure using sequential organization to solve real life problems.
CO2	**Analyze** problems to **apply** suitable searching and sorting algorithm to various applications.
CO3	**Analyze** problems to **use variants of** linked list and solve various real life problems.
CO4	Designing and implement data structures and algorithms for solving different Kinds ofproblems.
Course code and Name: 217523- OOP and Computer Graphics Laboratory	
CO1	**Understand** and **apply** the concepts like inheritance, polymorphism, exceptionhandling and generic structures for implementing reusable programming codes.
CO2	**Analyze** the concept of file and **apply** it while storing and retrieving the data fromsecondary storages.
CO3	**Analyze** and **apply** computer graphics algorithms for line-circle drawing, scanconversion and filling with the help of object oriented programming concepts.
CO4	**Understand** the concept of windowing and clipping and **apply** various algorithms tofill and cli polygons.
CO5	**Apply** logic to implement, curves, fractals, animation and gaming programs.
Course Code and Name: 217525- Business Communication Skills	

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CO3	**Promote** obstacles in national integration and role of youth for National Integration
CO4	**Demonstrate** basic features of Indian Constitution.

217527-V: Foreign Language- Japanese (Module 1)

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

SEM- II

Course code and Name: 217528 - Statistics

CO1	Identify the use of appropriate statistical terms to describe data
CO2	Use appropriate statistical methods to collect, organize, display, and analyze relevantdata.
CO3	Use distribution functions for random variables
CO4	Distinguish between correlation coefficient and regression
CO5	Understand tests for hypothesis and its significance

Course code and Name: 217529 : Internet of Things

CO1	Have a thorough understanding of the structure, function and characteristics of computer systems and Understand the structure of, various number systems and its application in digital design.
CO2	Develop the skill set to build IoT systems and sensor interfacing.
CO3	Explain the concept of Internet of Things and identify the technologies that make up theinternet of things
CO4	Analyze trade-offs in interconnected wireless embedded device networks. Select Appropriate Protocols for IoT Solutions

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CO5	Design a simple IoT system comprising sensors by analyzing the requirements of IoTApplication
CO6	Identify the Application of IoT in automation of Commercial and Real World examples

Course Code and Name: 210252 : Data Structures and Algorithms

CO1	**Identify and articulate** the complexity goals and benefits of a good hashing scheme for real-world applications.
CO2	**Apply** non-linear data structures for solving problems of various domain.
CO3	**Design and specify** the operations of a nonlinear-based abstract data type and implement themin a high-level programming language.
CO4	**Analyze** the algorithmic solutions for resource requirements and optimization
CO5	**Use** efficient indexing methods and multiway search techniques to store and maintain data.
CO6	Use appropriate modern tools to understand and analyze the functionalities confined to the secondary storage.

Course Code and Name: 210253 : Software Engineering

CO1	**Analyze** software requirements and formulate design solution for a software.
CO2	**Design** applicable solutions in one or more application domains using software engineering approaches tha integrate ethical, social, legal and economic concerns.
CO3	**Apply** new software models, techniques and technologies to bring out innovative and novelistic solutior for the growth of the society in all aspects and evolving into their continuousprofessional development.
CO4	**Model** and design User interface and component-level.
CO5	**Identify** and handle risk management and software configuration management.
CO6	**Utilize** knowledge of software testing approaches, approaches to verification and validation
CO7	**Construct** software of high quality – software that is reliable, and that is reasonably easy to understand, modify and maintain efficient, reliable, robust and cost-effective software solutions.

Course Code and Name: 217530 : Management Information Systems

CO1	**Explain** the concepts of Management Information System and Business intelligence for MIS.

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CO2	**Discriminate** the usage of various structures, **Design/Program/Implement** the appropriate data structures; use them in implementations of abstract data types and Identity the appropriate data structure in approaching the problem solution
CO3	**Demonstrate** use of sequential data structures- Array and Linked lists to store and process data.
CO4	**Understand** the computational efficiency of the principal algorithms for searching and sorting and choose the most efficient one for the application.
CO5	**Compare** and **contrast** different implementations of data structures (dynamic and static).
CO6	**Understand, Implement and apply** principles of data structures-stack and queue to solve computational problems.

Course Code and Name: 210243- Object Oriented Programming(OOP)

CO1	**Apply** constructs- sequence, selection and iteration; classes and objects, inheritance, use ofpredefine classes from libraries while developing software.
CO2	**Design** object-oriented solutions for small systems involving multiple objects.
CO3	**Use** virtual and pure virtual function and complex programming situations
CO4	**Apply** object-oriented software principles in problem solving.
CO5	**Analyze** the strengths of object-oriented programming.
CO6	**Develop** the application using object oriented programming language (C++).

Course code and Name: 210244- Computer Graphics

CO1	**Identify** the basic terminologies of Computer Graphics and interpret the mathematical foundation of the concepts of computer graphics.
CO2	**Apply** mathematics to develop Computer programs for elementary graphic operations
CO3	**Illustrate** the concepts of windowing and clipping and **apply** various algorithms to fill and clippolygons.
CO4	**Understand** and **apply** the core concepts of computer graphics, including transformation intwo and three dimensions, viewing and projection.
CO5	**Understand** the concepts of color models, lighting, shading models and hidden surface elimination.

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CO4	Design the reliable and scalable solution to meet challenges
CO5	Evaluate the solution based on the criteria specified
CO6	Inculcate long life learning attitude towards the societal problems

Course Code and Name: 217534 : Code of Conduct

CO1	**Understand** 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.
CO2	**Aware** of professional rights and responsibilities of an engineer, responsibilities of an engineer for safety and risk benefit analysis.
CO3	**Understand** the impact of the professional Engineering solutions in societal and Environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
CO4	**Acquire** 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.

Course Code and Name: 217535 : Audit Course 4

217535-I: Water Management

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 an distribution.

217535-II: Intellectual Property Rights and Patents

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

217535-III: The Science of Happiness

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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

217535-IV: Yoga and Meditation

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.

217535-V: Foreign Language (Japanese) Module 2

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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