

Shree Mahavir Education Society's
Sanghavi College of Engineering, Nashik
Department of Computer Engineering
Course Outcomes

Second Year (2019 Pattern) : Semester-I

Course code	Course Name	Course Outcomes(Cos)
210241	Discrete Mathematics	<p>CO1: Formulate problems precisely, solve the problems, apply formal proof techniques, and explain the reasoning clearly.</p> <p>CO2: Apply appropriate mathematical concepts and skills to solve problems in both familiar and unfamiliar situations including those in real-life contexts.</p> <p>CO3: Design and analyze real world engineering problems by applying set theory, propositional logic and to construct proofs using mathematical induction.</p> <p>CO4: Specify, manipulate and apply equivalence relations; construct and use functions and apply these concepts to solve new problems.</p> <p>CO5: Calculate numbers of possible outcomes using permutations and combinations; to model and analyze computational processes using combinatorics.</p> <p>CO6: Model and solve computing problem using tree and graph and solve problems using appropriate algorithms.</p> <p>CO7: Analyze the properties of binary operations, apply abstract algebra in coding theory and evaluate the algebraic structures.</p>
210242	Fundamentals of Data Structures	<p>CO1: Design the algorithms to solve the programming problems, identify appropriate algorithmic strategy for specific application, and analyze the time and space complexity.</p> <p>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.</p> <p>CO3: Demonstrate use of sequential data structures- Array and Linked lists to store and process data.</p> <p>CO4: Understand the computational efficiency of the principal algorithms for searching and sorting and choose the most efficient one for the application.</p> <p>CO5: Compare and contrast different implementations of data structures (dynamic and static).</p> <p>CO6: Understand, Implement and apply principles of data structures-stack and queue to solve computational problems.</p>

Course code	Course Name	Course Outcomes(Cos)
210243	Object Oriented Programming	<p>CO1: Apply constructs- sequence, selection and iteration; classes and objects, inheritance, use of predefined classes from libraries while developing software.</p> <p>CO2: Design object-oriented solutions for small systems involving multiple objects.</p> <p>CO3: Use virtual and pure virtual function and complex programming situations.</p> <p>CO4: Apply object-oriented software principles in problem solving.</p> <p>CO5: Analyze the strengths of object-oriented programming.</p> <p>CO6: Develop the application using object oriented programming language(C++).</p>
210244	Computer Graphics	<p>CO1: Identify the basic terminologies of Computer Graphics and interpret the mathematical foundation of the concepts of computer graphics.</p> <p>CO2: Apply mathematics to develop Computer programs for elementary graphic operations.</p> <p>CO3: Illustrate the concepts of windowing and clipping and apply various algorithms to fill and clip polygons.</p> <p>CO4: Understand and apply the core concepts of computer graphics, including transformation in two and three dimensions, viewing and projection.</p> <p>CO5: Understand the concepts of color models, lighting, shading models and hidden surface elimination.</p> <p>CO6: Create effective programs using concepts of curves, fractals, animation and gaming.</p>
210245	Digital Electronics and Logic Design	<p>CO1: Simplify Boolean Expressions using K Map. CO2: Design and implement combinational circuits. CO3: Design and implement sequential circuits.</p> <p>CO4: Develop simple real-world application using ASM and PLD.</p> <p>CO5: Differentiate and Choose appropriate logic families IC packages as per the given design specifications.</p> <p>CO6: Explain organization and architecture of computer system</p>
210246	Data Structures Laboratory	<p>CO1: Use algorithms on various linear data structure using sequential organization to solve real life problems.</p> <p>CO2: Analyze problems to apply suitable searching and sorting algorithm to various applications.</p> <p>CO3: Analyze problems to use variants of linked list and solve various real life problems.</p>

Course code	Course Name	Course Outcomes(Cos)
210246	Data Structures Laboratory	CO4: Designing and implement data structures and algorithms for solving different kinds of problems.
210247	OOP and Computer Graphics Laboratory	CO1: Understand and apply the concepts like inheritance, polymorphism, exception handling and generic structures for implementing reusable programming codes. CO2: Analyze the concept of file and apply it while storing and retrieving the data from secondary storages. CO3: Analyze and apply computer graphics algorithms for line-circle drawing, scan conversion and filling with the help of object oriented programming concepts. CO4: Understand the concept of windowing and clipping and apply various algorithms to fill and clip polygons. CO5: Apply logic to implement, curves, fractals, animation and gaming programs.
210248	Digital Electronics Laboratory	CO1: Understand the working of digital electronic circuits. CO2: Apply the knowledge to appropriate IC as per the design specifications. CO3: Design and implement Sequential and Combinational digital circuits as per the specifications.
210249	Business Communication Skills	CO1: Express effectively through verbal/oral communication and improve listening skills CO2: Write precise briefs or reports and technical documents. CO3: Prepare for group discussion / meetings / interviews and presentations. CO4: Explore goal/target setting, self-motivation and practicing creative thinking. CO5: Operate effectively in multi-disciplinary and heterogeneous teams through the knowledge of team work, Inter-personal relationships, conflict management and leadership qualities.
210250	Humanity and Social Science	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.

Course code	Course Name	Course Outcomes(Cos)
210251	Audit Course 3- I: Green Construction and Design	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 the design of a new home or office building through green construction
210251	Audit Course 3 -II: Social Awareness and Governance Program	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.
210251	Audit Course 3- III: Environmental Studies	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
210251	Audit Course 3 -IV: Smart Cities	CO1: Understand the dynamic behavior of the urban system by going beyond the physical appearance and by focusing on representations, properties and impact factors CO2: Explore the city as the most complex human-made organism with a metabolism that can be 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 of future cities CO5: Understand how citizens can benefit from data-informed design to develop smart and responsive cities
210251	Audit Course 3-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.

Course code	Course Name	Course Outcomes(Cos)
Second Year (2019 Pattern) : Semester-II		
207003	Engineering Mathematics III	<p>CO1: Solve Linear differential equations, essential in modelling and design of computer-based systems.</p> <p>CO2: Apply concept of Fourier transform and Z-transform and its applications to continuous and discrete systems and image processing.</p> <p>CO3: Apply Statistical methods like correlation and regression analysis and probability theory for data analysis and predictions in machine learning.</p> <p>CO4: Solve Algebraic and Transcendental equations and System of linear equations using numerical techniques.</p> <p>CO5: Obtain Interpolating polynomials, numerical differentiation and integration, numerical solutions of ordinary differential equations used in modern scientific computing.</p>
210252	Data Structures and Algorithms	<p>CO1: Identify and articulate the complexity goals and benefits of a good hashing scheme for real- world applications.</p> <p>CO2: Apply non-linear data structures for solving problems of various domain.</p> <p>CO3: Design and specify the operations of a nonlinear-based abstract data type and implement them in a high-level programming language.</p> <p>CO4: Analyze the algorithmic solutions for resource requirements and optimization</p> <p>CO5: Use efficient indexing methods and multiway search techniques to store and maintain data.</p> <p>CO6: Use appropriate modern tools to understand and analyze the functionalities confined to the secondary storage.</p>
210253	Software Engineering	<p>CO1: Analyze software requirements and formulate design solution for a software.</p> <p>CO2: Design applicable solutions in one or more application domains using software engineering approaches that integrate ethical, social, legal and economic concerns.</p> <p>CO3: Apply new software models, techniques and technologies to bring out innovative and novelistic solutions for the growth of the society in all aspects and evolving into their continuous professional development.</p> <p>CO4: Model and design User interface and component-level.</p> <p>CO5: Identify and handle risk management and software configuration management.</p> <p>CO6: Utilize knowledge of software testing approaches, approaches to verification and validation.</p> <p>CO7: Construct software of high quality – software that is reliable, and that is reasonably easy to understand, modify and</p>

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210253	Software Engineering	maintain efficient, reliable, robust and cost-effective software solutions.
210254	Microprocessor	CO1: Exhibit skill of assembly language programming for the application. CO2: Classify Processor architectures. CO3: Illustrate advanced features of 80386 Microprocessor. CO4: Compare and contrast different processor modes. CO5: Use interrupts mechanism in applications CO6: Differentiate between Microprocessors and Microcontrollers. CO7: Identify and analyze the tools and techniques used to design, implement, and debug microprocessor-based systems.
210255	Principles of Programming Languages	CO1: Make use of basic principles of programming languages. CO2: Develop a program with Data representation and Computations. CO3: Develop programs using Object Oriented Programming language : Java. CO4: Develop application using inheritance, encapsulation, and polymorphism. CO5: Demonstrate Multithreading for robust application development. CO6: Develop a simple program using basic concepts of Functional and Logical programming paradigm.
210256	Data Structures and Algorithms Laboratory	CO1: Understand the ADT/libraries, hash tables and dictionary to design algorithms for a specific 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-way searching, file organization and compression. CO5: Analyze the efficiency of most appropriate data structure for creating efficient solutions for engineering design situations.
210257	Microprocessor Laboratory	CO1. Understand and apply various addressing modes and instruction set to implement assembly language programs CO2. Apply logic to implement code conversion CO3. Analyze and apply logic to demonstrate processor mode of operation

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210258	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 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
210259	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.
210260	Audit Course 4-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 and distribution.
210260	Audit Course 4-II: Intellectual Property Rights and Patents	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 involved in creating
210260	Audit Course 4-III: The Science of Happiness	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

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210260	Audit Course 4-III: The Science of Happiness	CO4: Understand what is mindfulness and its real world applications
210260	Audit Course 4-IV: Yoga and Meditation	CO1: Understand philosophy and religion as well as daily life issues will be challenged and enhanced. CO2: Enhances the immune system. CO3: Intellectual and philosophical understanding of the theory of yoga and basic related Hindu scriptures will be developed. CO4: Powers of concentration, focus, and awareness will be heightened.
210260	Audit Course 4-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 CO4. develop interest to pursue professional Japanese Language course

