Hope Foundation's
International Institute of Information Technology
P-14, Rajiv Gandhi Info Tech Park, Phase – 1, Hinjawadi, Pune – 411 057
Department of Computer Engineering

Course Outcomes (COs)

SE (Computer Engineering) -2019 Pattern

Course Code	Name of Subject/ Course	Course Outcome (COs)
SEM I		
210241	Discrete Mathematics	❑ Design and analyze real world engineering problems by applying set theory, propositional logic and to construct proofs using mathematical induction. ❑ Specify, manipulate and apply equivalence relations; construct and use functions and apply these concepts to solve problems in both familiar and unfamiliar situations including those in real-life contexts. ❑ Calculate numbers of possible outcomes using permutations and combinations; to model and analyze computational processes using combinatorics. ❑ Model and solve computing problem using graph and apply appropriate algorithms to solve problems in both familiar and unfamiliar situations including those in real-life contexts. ❑ Model and solve computing problem using graph and apply appropriate algorithms to solve problems in both familiar and unfamiliar situations including those in real-life contexts. ❑ Analyze the properties of binary operations, apply abstract algebra in coding theory and evaluate the algebraic structures.
		❑ Design the algorithms to solve the programming problems, identify appropriate algorithmic strategy for specific application, and analyze the time and space complexity. ❑ Discriminate the usage of various structures,

210242	Fundamentals of Data 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. ❑ Demonstrate use of sequential data structures- Array and Linked lists to store and process data. ❑ Understand the computational efficiency of the principal algorithms for searching and sorting and choose the most efficient one for the application. ❑ Compare and contrast different implementations of data structures (dynamic and static) ❑ Understand, Implement and apply principles of data structures-stack and queue to solve computational problems.
210243	Object Oriented Programming	❑ Apply constructs- sequence, selection and iteration; classes and objects, inheritance, use of predefined classes from libraries for programs ❑ Design object-oriented solutions for small systems involving multiple objects ❑ Use virtual and pure virtual function and complex programming situations ❑ Apply object-oriented software principles in problem solving ❑ Analyze the strengths like abstraction of object-oriented programming ❑ Develop the mini project using object oriented programming language (C++).
210244	Computer Graphics	❑ Define basic terminologies of Computer Graphics, interpret the mathematical foundation of the concepts of computer graphics and apply ❑ Define the concept of windowing and clipping and apply various algorithms to fill and clip polygons. ❑ Explain the core concepts of computer graphics, including transformation in two and three dimensions, viewing and projection. ❑ Explain the concepts of color models, lighting, shading models and hidden surface elimination. ❑ Describe the fundamentals of curves, fractals, animation and gaming. ❑ Understand strategic approach to solve problems in the domain of Computer Graphics.

210245	Digital Electronics & Logic Design	❑ Simplify Boolean Expressions using K Map. ❑ Design and implement combinational circuits. ❑ Design and implement sequential circuits ❑ Develop simple real-world application using ASM and PLD ❑ Differentiate and Choose appropriate logic families IC packages as per the given design specifications ❑ Explain organization and architecture of computer system
210246	Data Structures Laboratory	❑ Use algorithms on various linear data structure using sequential organization to solve real life problems. ❑ Analyze problems to apply suitable searching and sorting algorithm to various applications. ❑ Analyze problems to use variants of linked list and solve various real life problems. ❑ Designing and implement data structures and algorithms for solving different kinds of problems. ❑ Apply and analyze stack implementation to solve real life problems. ❑ Apply and analyze queue implementation to solve real life problems.
210247	OOP and Computer Graphics Laboratory	❑ Understand and apply the concepts like inheritance, polymorphism, and exception handling and generic structures for implementing reusable ❑ To analyze and implement the concept of pointer programming and template ❑ Analyze the concept of file and apply it while storing and retrieving the data from file ❑ To implement various data structure using STL programs ❑ Analyze and apply computer graphics algorithms for line-circle drawing, scan conversion and filling with the help of object oriented programming concepts. ❑ Understand the concept of windowing and clipping and apply various algorithms to fill and clip polygons and Apply logic to implement, curves, fractals, animation and gaming programs.
210248	Digital Electronics Laboratory	❑ Understand the working of digital electronic circuits ❑ Apply the knowledge to appropriate IC as per the design specifications. ❑ Design and implement Combinational digital circuits as per the specific IC 7483, 74153 ❑ Design and implement Combinational digital circuits for Parity Checker and Comparator ❑ Design and implement Sequential digital circuits as per the specific IC 7490 Flip Flops ❑ Design and implement Sequential digital circuits as per the design of Sequence Generator and Detector.

210249	Business Communication Skills	❑ Express effectively through verbal / non-verbal communication and improve listening skills ❑ Write precise briefs or reports and technical documents. ❑ Prepare for group discussion / meetings / interviews and presentations. ❑ Explore goal/target setting, self-motivation and practicing creative thinking. ❑ Operate effectively in multi-disciplinary and heterogeneous teams through the knowledge of team work, Inter-personal relationships, conflict management and leadership qualities. ❑ Learn and enhance effective Language Skills
210250	Humanity and Social Science	❑ Be aware of various issues concerning humans and society ❑ Be aware of students' responsibility towards society ❑ Be sensitized about broader issues regarding social, cultural, economical and human aspects, involved in social changes ❑ Be able to understand major ideas values, believes and experiences, that have shared human history and cultures ❑ Be able to understand the nature of the individual and the relationship between self and the community ❑ Develop characteristics that encourage personal and professional fulfillment and be responsible citizen
210251	Audit Course 3 (Smart Cities)	❑ Understand the dynamic behavior of the urban system by going beyond the physical appearance and by focusing on representations, properties and impact factors ❑ Explore the city as the most complex human-made organism with a metabolism that can be modeled in terms of stocks and flows ❑ Knowledge about data-informed approaches for the development of the future city, based on crowd sourcing and sensing ❑ Knowledge about the latest research results in for the development and management of future cities ❑ Understand how citizens can benefit from data-informed design to develop smart and responsive cities

SEMESTER II		
207003	Engineering Mathematics-III	❑ Solve Linear differential equations, essential in modeling and design of computer-based systems. ❑ Apply concept of Fourier transform and Z-transform and its applications to continuous and discrete systems and image processing. ❑ Apply statistical methods like correlation and regression analysis for data analysis and predictions in machine learning. ❑ Apply probability theory for data analysis and predictions in machine learning. ❑ Solve Algebraic and Transcendental equations and System of linear equations using numerical techniques. ❑ Obtain Interpolating polynomials, numerical differentiation and integration, numerical solutions of ordinary differential equations used in modern scientific computing.
210252	Data Structures and Algorithms	❑ Identify and articulate the complexity goals and benefits of a good hashing scheme for real- world applications. ❑ Apply non-linear data structures for solving problems of various domains. ❑ Design and specify the operations of a nonlinear-based abstract data type and implement them in a high-level programming language. ❑ Analyze the algorithmic solutions for resource requirements and Optimization. ❑ Use efficient indexing methods and multiway search techniques to store and maintain data ❑ Use appropriate modern tools to understand and analyze the functionalities confined to the secondary storage.
210253	Software Engineering	❑ Analyze software requirements and formulate design solution for software. ❑ Design applicable solutions in one or more application domains using software engineering approaches that integrate ethical, social, legal and economic concerns. ❑ 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. ❑ Model and design User interface and component-level. ❑ Identify and handle risk management and software configuration management. ❑ Utilize knowledge of software testing approaches, approaches to verification and validation. ❑ 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

210254	Microprocessor	❑ Exhibit skill of assembly language programming for the application. ❑ Classify Processor architectures. ❑ Illustrate advanced features of 80386 Microprocessor. ❑ Compare and contrast different processor modes ❑ Use interrupts mechanism in applications ❑ Differentiate between Microprocessors and Microcontrollers. ❑ Identify and analyze the tools and techniques used to design, implement, and debug microprocessor-based systems
210255	Principles of Programming Language	❑ To make use of principles of programming language ❑ Develop program with data representation and computation ❑ Develop programs using OOPL: Java ❑ Develop application using inheritance , encapsulation and polymorphism ❑ Demonstrate Multithreading for robust application development ❑ Develop simple program using basic concepts of functional and logical programming paradigm
210256	Data Structures and Algorithms Laboratory	❑ Understand the ADT/libraries, hash tables and dictionary to design algorithms for a specific problem. ❑ Choose most appropriate data structures and apply algorithms for graphical solutions of the problems. ❑ Apply and analyze non linear data structures to solve real world complex problems. ❑ Analyze the efficiency of most appropriate data structure for creating efficient solutions for engineering design situations. ❑ Apply and analyze algorithm design techniques for indexing, sorting, multi-way searching ❑ Apply and analyze algorithm design techniques for file organization.
210257	Microprocessor Laboratory	❑ Understand and apply various addressing modes ❑ Apply instruction set to implement assembly language programs ❑ Apply logic to implement code conversion ❑ Apply logic for implementing string operations ❑ Analyze and apply logic to demonstrate processor ❑ Understand working of GDTR, LDTR and IDTR
210258	Project Based Learning II	❑ Identify the real life problem from societal point of view ❑ Choose and compare alternative approaches to select more feasible one ❑ Analyze and synthesize identified problem from technological perspective ❑ Design reliable and scalable solution to meet challenges ❑ Evaluate the solution based on the criteria specified ❑ Inculcate lifelong learning attitude towards the societal problem
210259	Code of Conduct	❑ 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 ❑ Aware of professional rights and responsibilities of an engineer, responsibilities of an engineer for safety and risk

		benefit analysis. ❑ Understand the impact of the professional Engineering solutions in societal and Environmental contexts, and demonstrate the knowledge of, and need for sustainable development. ❑ 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. ❑ Develop understanding of engineer's rights and responsibilities act in morally desirable ways, towards moral commitment and responsible conduct ❑ Able to identify and resolve ethical as well as conflict of interest issues as part of their professional lives
210260	Audit Course-4 (Intellectual Property Rights and Patents)	❑ Understand the fundamental legal principles related to confidential information, copyright, patents, designs, trademarks and unfair competition ❑ Identify, apply and assess principles of law relating to each of these areas of intellectual property ❑ Apply the appropriate ownership rules to intellectual property you have been involved in creating