Shree Mahavir Education Society's

Sanghavi College of Engineering, Nashik

Department of Computer Engineering

Course Outcomes

Third Year (2019 Pattern) : Semester-I

Course code	Course Name	Course Outcomes(Cos)
310241	Database Management Systems	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
310242	Theory of Computation	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: Devise Turing Machine for the different requirements outlined by theoretical computer science CO6: Analyze different classes of problems, and study concepts of NP completeness
310243	Systems Programming and Operating System	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

Course code	Course Name	Course Outcomes(Cos)
310244	Computer Networks and Security	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
310245(A)	Elective-I Internet of Things and Embedded Systems	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
310245(B)	Elective-I Human Computer Interface	CO1: Design effective Human-Computer-Interfaces for all kinds of users CO2: Apply and analyze the user-interface with respect to golden rules of interface CO3: Analyze and evaluate the effectiveness of a user-interface design CO4: Implement the interactive designs for feasible data search and retrieval CO5: Analyze the scope of HCI in various paradigms like ubiquitous computing, virtual reality ,multi-media, World wide web related environments CO6: Analyze and identify user models, user support, and stakeholder requirements of HCI systems
310245C	Elective-I Distributed Systems	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

Course code	Course Name	Course Outcomes(Cos)
310245(D)	Elective-I Software Project Management	CO1: Comprehend Project Management Concepts 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
310246	Database Management Systems Laboratory	CO1: Design E-R Model for given requirements and convert the same into database tables CO2: Design schema in appropriate normal form considering actual requirements CO3: Implement SQL queries for given requirements, using different SQL concepts CO4: Implement PL/SQL Code block for given requirements CO5: Implement NoSQL queries using MongoDB CO6: Design and develop application considering actual requirements and using database concepts
310247	Computer Networks and Security Laboratory	CO1: Analyze the requirements of network types, topology and transmission media CO2: Demonstrate error control, flow control techniques and protocols and analyze them CO3: Demonstrate the subnet formation with IP allocation mechanism and apply various routing algorithms CO4: Develop Client-Server architectures and prototypes CO5: Implement web applications and services using application layer protocols CO6: Use network security services and mechanisms
310248	Laboratory Practice I	Systems Programming and Operating System CO1: Implement language translators CO2: Use tools like LEX and YACC CO3: Implement internals and functionalities of Operating System • Internet of Things and Embedded Systems CO4: Design IoT and Embedded Systems based application CO5: Develop smart applications using IoT CO6: Develop IoT applications based on cloud environment OR • Human Computer Interface CO4:Implement the interactive designs for feasible data search and retrieval CO5:Analyze the scope of HCI in various paradigms like ubiquitous computing, virtual Reality and ,multi-media, World wide web related environments CO6:Analyze and identify user models, user support, socio-organizational issues, and stakeholder requirements of HCI systems OR

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310248	Laboratory Practice I	• Distributed Systems CO4: Demonstrate knowledge of the core concepts and techniques in Distributed Systems CO5: Apply the principles of state-of-the-Art Distributed Systems in real time applications CO6: Design, build and test application programs on Distributed Systems OR • Software Project Management CO4:Apply Software Project Management tools CO5:Implement software project planning and scheduling CO6:Analyse staffing in software project
310249	Seminar and Technical Communication	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
310250(A)	Audit Course 5 (A) :Cyber Security	CO 1: Understand and classify various cybercrimes CO 2: Understand how criminals plan for the cybercrimes CO 3: Apply tools and methods used in cybercrime CO 4:Analyze the examples of few case studies of cybercrimes
310250(B)	Audit Course 5 (B): Professional Ethics and Etiquette	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.
310250©	Audit Course 5©: Learn New Skills -Full Stack Developer	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
310250(D)	Audit Course 5: (D) Engineering Economics	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

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310250 E	Audit Course 5: (E) Foreign Language (Japanese)-Module 3	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
Third Year (2019 Pattern) : Semester-II		
310251	Data Science and Big Data Analytics	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	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
310253	Artificial Intelligence	CO1: Identify and apply suitable Intelligent agents for various AI applications 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
310254(A)	Elective-II -Information Security	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

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310254(A)	Elective-II -Information Security	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
310254(B)	Elective-II- Augmented and Virtual Reality	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
310254©	Elective-II- Cloud Computing	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
310254(D)	Elective-II-Software Modeling and Architecture	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	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.

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310255	Internship	CO5:Creating network and social circle, and developing relationships with industry people. CO6: To analyze various career opportunities and decide carrier goals.
310256	Data Science and Big Data Analytics Laboratory	CO1: Apply principles of Data Science for the analysis of real time problems CO2: Implement data representation using statistical methods CO3: Implement and evaluate data analytics algorithms CO4: Perform text preprocessing CO5: Implement data visualization techniques CO6: Use cutting edge tools and technologies to analyze Big Data
310257	Web Technology Laboratory	CO1: Understand the importance of website planning and website design issues CO2: Apply the client side and server side technologies for web application development CO3: Analyze the web technology languages, frameworks and services CO4:Create three tier web based applications
310258	Laboratory Practice II	• Artificial Intelligence CO1: Design a system using different informed search / uninformed search or heuristic approaches CO2: Apply basic principles of AI in solutions that require problem solving, inference, perception, knowledge representation, and learning CO3: Design and develop an interactive AI application • Information Security CO4: Use tools and techniques in the area of Information Security CO5: Use the cryptographic techniques for problem solving CO6: Design and develop security solution OR • Augmented and Virtual Reality CO4: Use tools and techniques in the area of Augmented and Virtual Reality CO5: Use the representing and rendering system for problem solving CO6: Design and develop ARVR applications OR • Cloud Computing CO4: Use tools and techniques in the area of Cloud Computing CO5: Use cloud computing services for problem solving CO6: Design and develop applications on cloud OR • Software Modeling and Architectures CO4: Use tools and techniques in the area Software Modeling and Architectures CO5: Use the knowledge of Software Modeling and Architectures for problem solving

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310258	Laboratory Practice II	Architectures for problem solving CO6: Design and develop applications using UML as fundamental tool
310259(A)	Audit Course- 6 (A):Digital and Social Media Marketing	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
310259(B)	Audit Course- 6 (B):Sustainable Energy Systems	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
310259(C)	Audit Course- 6 © :Leadership and Personality Development	CO1: Express effectively through communication and improve listening skills 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, people skills and leadership qualities.
310259(D)	Audit Course- 6 (D):Foreign Language (Japanese) Module 4	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
310259(E)	Audit Course- 6 (E):Learn New Skill- ‘Software Development Using Agility Approach’	CO1: Illustrate the agility and principles CO2: Understand the software development using agile methodology CO3: Apply Dev Ops for the software product development CO4: Develop software products for early delivery through continual feedback and learning