Bharati Vidyapeeth's

College of Engineering Lavale, Pune-412115

Department of Computer Engineering

Course Outcomes (TE 2019 Pattern)

Semester V

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.

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.

310245A: 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.

310245B: 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.

310245D: 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

CO1: Implement language translators .
CO2: Use tools like LEX and YACC.

CO3: Implement internals and functionalities of Operating System.
CO4: Design IoT and Embedded Systems based application.
CO5: Develop smart applications using IoT.
CO6: Develop IoT applications based on cloud environment.

OR

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

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

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: Audit Course 5

310250(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):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(C):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):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.

310250(E):Foreign Language (one of Japanese/ Spanish/ French/ German)

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.

Semester VI

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.

310254A: 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 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.

310254B: 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.

310254C: 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.

310254D: Elective II- Software Modeling and Architectures

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.
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

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.
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

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

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

CO4: Use tools and techniques in the area Software Modeling and Architectures.
CO5: Use the knowledge of Software Modeling and Architectures for problem solving.
CO6: Design and develop applications using UML as fundamental tool.

310259: Audit Course 6

310259(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):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):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):Foreign Language (one of Japanese/Spanish/French/German).

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):Learn New Skills - 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.