CAYMET's

Siddhant College of Engineering

Savitribai Phule Pune University, Pune

Third Year Computer Engineering (2019 Course)

COURSE OBJECTIVE & OUTCOMES

SEM I

Subject Code &Name -310241: Database Management Systems

Course Objectives

1. To understand the fundamental concepts of Database Management Systems
2. To acquire the knowledge of database query languages and transaction processing
3. To understand systematic database design approaches
4. To acquire the skills to use a powerful, flexible, and scalable general-purpose databases to handle Big Data
5. To be familiar with advances in databases and applications

Course Outcomes

On completion of the course, learners should be able to

1. Analyze and design Database Management System using ER model
2. Implement database queries using database languages
3. Normalize the database design using normal forms
4. Apply Transaction Management concepts in real-time situations
5. Use NoSQL databases for processing unstructured data
6. Differentiate between Complex Data Types and analyze the use of appropriate data types

Subject Code &Name -310242: Theory of Computation

Course Objectives

1. To introduce the students to basics of Theory of Computation
2. To study abstract computing models to provide a formal connection between algorithmic problem solving and the theory of languages
3. To understand Grammar**,** Pushdown Automata and Turing Machine for language processing and algorithm design
4. To learn about the theory of computability and complexity for algorithm design

Course Outcomes

After completion of the course, learners should be able to

1. Understand formal language, translation logic, essentials of translation, alphabets, language representation and apply it to design Finite Automata and its variants
2. Construct regular expression to present regular language and understand pumping lemma for RE
3. Design Context Free Grammars and learn to simplify the grammar
4. Construct Pushdown Automaton model for the Context Free Language
5. Devise Turing Machine for the different requirements outlined by theoretical computer science
6. Analyze different classes of problems, and study concepts of NP completeness

Subject Code &Name - 310243: Systems Programming and Operating System

Course Objectives

1. To get acquainted with the basics of System Programming
2. To acquire knowledge of data structures used in the design of System Software
3. To be familiar with the format of object modules, the functions of linking, relocation, and loading
4. To comprehend the structures and functions of Operating Systems and process management.

5. To deal with concurrency and deadlock in the Operating System
6. To learn and understand memory management of Operating System

Course Outcomes

On completion of the course, learners should be able to

1. Analyze and synthesize basic System Software and its functionality.
2. Identify suitable data structures and Design & Implement various System Software
3. Compare different loading schemes and analyze the performance of linker and loader
4. Implement and Analyze the performance of process scheduling algorithms
5. Identify the mechanism to deal with deadlock and concurrency issues
6. Demonstrate memory organization and memory management policies

Subject Code &Name - 310244: Computer Networks and Security

Course Objectives

1. To understand the fundamental concepts of networking standards, protocols and technologies
2. To learn different techniques for framing, error control, flow control and routing
3. To learn different layer protocols in the protocol stacks
4. To understand modern network architectures with respect to design and performance
5. To learn the fundamental concepts of Network Security

Course Outcomes

On completion of the course, learners should be able to

1. Summarize fundamental concepts of Computer Networks, architectures, protocols and technologies
2. Illustrate the working and functions of data link layer
3. Analyze the working of different routing protocols and mechanisms
4. Implement client-server applications using sockets
5. Illustrate role of application layer with its protocols, client-server architectures
6. Comprehend the basics of Network Security

Subject Code &Name- 310245(A): Internet of Things and Embedded Systems

Course Objectives

1. To understand fundamentals of Internet of Things (IoT) and Embedded Systems
2. To learn advances in Embedded Systems and IoT
3. To learn methodologies for IoT application development
4. To learn the IoT protocols, cloud platforms and security issues in IoT
5. To learn real world application scenarios of IoT along with its societal and economic impact using case studies and real time examples

Course Outcomes

On completion of the course, learners should be able to

1. Understand the fundamentals and need of Embedded Systems for the Internet of Things
2. Apply IoT enabling technologies for developing IoT systems
3. Apply design methodology for designing and implementing IoT applications
4. Analyze IoT protocols for making IoT devices communication
5. Design cloud based IoT systems
6. Design and Develop secured IoT applications

Subject Code &Name - 310245(B): Human Computer Interface

Course Objectives

1. To understand the importance of HCI design process in software development
2. To learn fundamental aspects of designing and implementing user interfaces
3. To study HCI with technical, cognitive and functional perspectives
4. To acquire knowledge about variety of effective human-computer-interactions

5. To co-evaluate the technology with respect to adapting changing user requirements in interacting with computer.

Course Outcomes

On completion of the course, learners should be able to

1. Design effective Human-Computer-Interfaces for all kinds of users
2. Apply and analyze the user-interface with respect to golden rules of interface
3. Analyze and evaluate the effectiveness of a user-interface design
4. Implement the interactive designs for feasible data search and retrieval
5. Analyze the scope of HCI in various paradigms like ubiquitous computing, virtual reality ,multi-media, World wide web related environments
6. Analyze and identify user models, user support, and stakeholder requirements of HCI systems

Subject Code &Name - <u>310245(C): Distributed Systems</u>

Course Objectives

1. To learn the fundamentals of Distributed Systems
2. To learn types of communication and synchronization in Distributed Systems
3. To acquaint with the Distributed File Systems
4. To understand consistency and replication in Distributed Systems
5. To understand the fault tolerance based Distributed Systems

Course Outcomes

On completion of the course, learners should be able to

1. Analyze Distributed Systems types and architectural styles
2. Implement communication mechanism in Distributed Systems
3. Implement the synchronization algorithms in Distributed System applications
4. Develop the components of Distributed File System
5. Apply replication techniques and consistency model in Distributed Systems
6. Build fault tolerant Distributed Systems

Subject Code &Name - <u>310245(D): Software Project Management</u>

Course Objectives

1. To understand the fundamentals of Software Project Management
2. To investigate software project planning and management tools
3. To learn software project scheduling and tracking
4. To discuss about the agile project management
5. To know people management in software project

Course Outcomes

On completion of the course, learners should be able to

1. Comprehend Project Management Concepts
2. Use various tools of Software Project Management
3. Schedule various activities in software projects
4. Track a project and manage changes
5. Apply Agile Project Management
6. Analyse staffing process for team building and decision making in Software Projects and Management

Subject Code & Name - <u>310246: Database Management Systems Laboratory</u>

Course Objectives

1. To develop Database programming skills
2. To develop basic Database administration skills
3. To develop skills to handle NoSQL database
4. To learn, understand and execute process of software application development

Course Outcomes

On completion of the course, learners will be able to

1. Design E-R Model for given requirements and convert the same into database tables
2. Design schema in appropriate normal form considering actual requirements
3. Implement SQL queries for given requirements, using different SQL concepts
4. Implement PL/SQL Code block for given requirements
5. Implement NoSQL queries using MongoDB
6. Design and develop application considering actual requirements and using database concepts

Subject Code &Name - 310247: Computer Networks and Security Laboratory

Course Objectives

1. To learn computer network hardware and software components
2. To learn computer network topologies and types of network
3. To develop an understanding of various protocols, modern technologies and applications
4. To learn modern tools for network traffic analysis
5. To learn network programming

Course Outcomes

On completion of the course, learners will be able to

1. Analyze the requirements of network types, topology and transmission media
2. Demonstrate error control, flow control techniques and protocols and analyze them
3. Demonstrate the subnet formation with IP allocation mechanism and apply various routing algorithms
4. Develop Client-Server architectures and prototypes
5. Implement web applications and services using application layer protocols
6. Use network security services and mechanisms

Subject Code &Name - 310248: Laboratory Practice I

Course Objectives

1. To learn system programming tools
2. To learn modern operating system
3. To learn various techniques, tools, applications in IoT and Embedded Systems /Human Computer Interface/Distributed Systems/ Software Project Management

Course Outcomes

On completion of the course, learners will be able to

Systems Programming and Operating System

1. Implement language translators
2. Use tools like LEX and YACC
3. Implement internals and functionalities of Operating System

Internet of Things and Embedded Systems

1. Design IoT and Embedded Systems based application
2. Develop smart applications using IoT
3. Develop IoT applications based on cloud environment

OR

Human Computer Interface

1. Implement the interactive designs for feasible data search and retrieval
2. Analyze the scope of HCI in various paradigms like ubiquitous computing, virtual Reality and ,multi-media, World wide web related environments
3. Analyze and identify user models, user support, socio-organizational issues, and stakeholder requirements of HCI systems

OR

Distributed Systems

1. Demonstrate knowledge of the core concepts and techniques in Distributed Systems
2. Apply the principles of state-of-the-Art Distributed Systems in real time applications
3. Design, build and test application programs on Distributed Systems

OR

Software Project Management

1. Apply Software Project Management tools
2. Implement software project planning and scheduling
3. Analyse staffing in software project

SEM-II

Subject Code &Name - 310251: Data Science and Big Data Analytics

Course Objectives

1. To underst and the need of Data Science and Big Data
2. To understand computational statistics in Data Science
3. To study and understand the different technologies used for Big Data processing
4. To understand and apply data modeling strategies
5. To learn Data Analytics using Python programming
6. To be conversant with advances in analytics

Course Outcomes

After completion of the course, learners should be able to

1. Analyze needs and challenges for Data Science Big Data Analytics
2. Apply statistics for Big Data Analytics
3. Apply the lifecycle of Big Data analytics to real world problems
4. Implement Big Data Analytics using Python programming
5. Implement data visualization using visualization tools in Python programming
6. Design and implement Big Databases using the Hadoop ecosystem

Subject Code &Name - 310252: Web Technology

Course Objectives

1. To learn the fundamentals of web essentials and markup languages
2. To use the Client side technologies in web development
3. To use the Server side technologies in web development
4. To understand the web services and frameworks

Course Outcomes

On completion of the course, learners should be able to

1. Implement and analyze behavior of web pages using HTML and CSS
2. Apply the client side technologies for web development
3. Analyze the concepts of Servlet and JSP
4. Analyze the Web services and frameworks
5. Apply the server side technologies for web development
6. Create the effective web applications for business functionalities using latest web development platforms

Subject Code &Name - 310253: Artificial Intelligence

Course Objectives

1. To understand the concept of Artificial Intelligence (AI) in the form of various Intellectual tasks
2. To understand Problem Solving using various peculiar search strategies for AI
3. To understand multi-agent environment in competitive environment
4. To acquaint with the fundamentals of knowledge and reasoning
5. To devise plan of action to achieve goals as a critical part of AI
6. To develop a mind to solve real world problems unconventionally with optimality

Course Outcomes

After completion of the course, students should be able to

1. Identify and apply suitable Intelligent agents for various AI applications
2. Build smart system using different informed search / uninformed search or heuristic approaches
3. Identify knowledge associated and represent it by ontological engineering to plan a strategy to solve given problem
4. Apply the suitable algorithms to solve AI problems

5. Implement ideas underlying modern logical inference systems
6. Represent complex problems with expressive yet carefully constrained language of representation

Subject Code &Name - 310254(A): Information Security

Course Objectives

1. To understand the fundamental approaches, principles and apply these concepts in Information Security
2. To acquire the knowledge of mathematics for cryptography, understand the concepts of basic cryptography
3. To learn standard algorithms and protocols employed to provide confidentiality, integrity and authenticity
4. To acquire the knowledge of security protocol deployed in web security
5. To study Information Security tools

Course Outcomes

On completion of the course, learners should be able to

1. Understand the basics of Augmented and Virtual reality systems and list their applications
2. Describe interface to the Virtual World with the help of input and output devices
3. Explain representation and rendering system in the context of Virtual Reality
4. Analyze manipulation, navigation and interaction of elements in the virtual world
5. Summarize the basic concepts and hardware of Augmented Reality system
6. Create Mobile Augmented Reality using Augmented Reality techniques and software

Subject Code &Name -310254(C): Cloud Computing

Course Objectives

1. To study fundamental concepts of cloud computing
2. To learn various data storage methods on cloud
3. To understand the implementation of Virtualization in Cloud Computing
4. To learn the application and security on cloud computing
5. To study risk management in cloud computing
6. To understand the advanced technologies in cloud computing

Course Outcomes

On completion of the course, learners should be able to

1. Understand the different Cloud Computing environment
2. Use appropriate data storage technique on Cloud, based on Cloud application
3. Analyze virtualization technology and install virtualization software
4. Develop and deploy applications on Cloud
5. Apply security in cloud applications
6. Use advance techniques in Cloud Computing

Subject Code &Name - 310254(D): Software Modeling and Architecture

Course Objectives

1. To understand and apply Object Oriented concept for designing Object Oriented based model or application
2. To transform Requirement document to appropriate design
3. To acquaint with the interaction between quality attributes and software architecture
4. To understand different architectural designs, transform them into proper model and document them
5. To understand software architecture with case studies and explore with examples, use of design pattern application

Course Outcomes

On completion of the course, learners should be able to

1. Analyze the problem statement (SRS) and choose proper design technique for designing web-based/ desktop application
2. Design and analyze an application using UML modeling as fundamental tool
3. Evaluate software architectures
4. Use appropriate architectural styles and software design pattern
5. Apply appropriate modern tool for designing and modeling

Subject Code &Name - 310256: Data Science and Big Data Analytics Laboratory

Course Objectives

1. To understand principles of Data Science for the analysis of real time problems
2. To develop in depth understanding and implementation of the key technologies in Data Science and Big Data Analytics
3. To analyze and demonstrate knowledge of statistical data analysis techniques for decision- making
4. To gain practical, hands-on experience with statistics programming languages and Big Data tools

Course Outcomes

On completion of the course, learners will be able to

1. Apply principles of Data Science for the analysis of real time problems
2. Implement data representation using statistical methods
3. Implement and evaluate data analytics algorithms
4. Perform text preprocessing
5. Implement data visualization technique
6. Use cutting edge tools and technologies to analyze Big Data

Subject Code &Name - 310257: Web Technology Laboratory

Course Objectives

1. To learn the web based development environment
2. To use client side and server side web technologies
3. To design and develop web applications using front end technologies and backend databases

Course Outcomes

On completion of the course, learners will be able to

1. Understand the importance of website planning and website design issues
2. Apply the client side and server side technologies for web application development
3. Analyze the web technology languages, frameworks and services.
4. Create three tier web based applications

Subject Code &Name - 310258: Laboratory Practice II

Course Objectives

1. To learn and apply various search strategies for AI
2. To Formalize and implement constraints in search problems
3. To understand the concepts of Information Security / Augmented and Virtual Reality/Cloud Computing/Software Modeling and Architectures

Course Outcomes

On completion of the course, learner will be able to

Artificial Intelligence

1. Design a system using different informed search / uninformed search or heuristic approaches
2. Apply basic principles of AI in solutions that require problem solving, inference, perception, knowledge representation, and learning
3. Design and develop an interactive AI application

Information Security

1. Use tools and techniques in the area of Information Security
2. Use the cryptographic techniques for problem solving
3. Design and develop security solution

OR

Augmented and Virtual Reality

1. Use tools and techniques in the area of Augmented and Virtual Reality
2. Use the representing and rendering system for problem solving
3. Design and develop ARVR applications

OR

Cloud Computing

1. Use tools and techniques in the area of Cloud Computing
2. Use cloud computing services for problem solving
3. Design and develop applications on cloud

OR

Software Modeling and Architectures

1. Use tools and techniques in the area Software Modeling and Architectures
2. Use the knowledge of Software Modeling and Architectures for problem solving
3. Design and develop applications using UML as fundamental tool

*****