CAYMET's

Siddhant College of Engineering

Savitribai Phule Pune University, Pune

Third Year Information Technology (2015 Course)

COURSE OBJECTIVE & OUTCOMES

SEM I

Program Educational Objectives

1. The students of Information Technology course after passing out will
2. Possess strong fundamental concepts in mathematics, science, engineering and Technology to address technological challenges.
3. Possess knowledge and skills in the field of Computer Science and Information Technology for analyzing, designing and implementing complex engineering problems of any domain with innovative approaches.
4. Possess an attitude and aptitude for research, entrepreneurship and higher studies in the field of Computer Science and Information Technology.
5. Have commitment to ethical practices, societal contributions through communities and lifelong learning.
6. Possess better communication, presentation, time management and teamwork skills leading to responsible & competent professionals and will be able to address challenges in the field of IT at global level.

Program Outcomes

1. An ability to apply knowledge of mathematics, computing, science, engineering and technology
2. An ability to define a problem and provide a systematic solution with the help of conducting Experiments, analyzing the problem and interpreting the data
3. An ability to design, implement, and evaluate a software or a software/hardware system, Component, or process to meet desired needs within realistic constraints
4. An ability to identify, formulate, and provide systematic solutions to complex Engineering/technology problems
5. An ability to use the techniques, skills, and modern engineering technology tools, standard Processes necessary for practice as a it professional
6. An ability to apply mathematical foundations, algorithmic principles, and computer science
7. Theory in the modeling and design of computer-based systems with necessary constraints And assumptions

8. An ability to analyze and provide solution for the local and global impact of information technology on individuals, organizations and society
9. An ability to understand professional, ethical, legal, security and social issues and Responsibilities
10. An ability to function effectively as an individual or as a team member to accomplish a Desired goal(s)
11. An ability to engage in life-long learning and continuing professional development to cope up With fast changes in the technologies/tools with the help of electives, professional Organizations and extra-curricular activities
12. An ability to communicate effectively in engineering community at large by means of Effective presentations, report writing, paper publications, demonstrations;
13. An ability to understand engineering, management, financial aspects, performance, Optimizations and time complexity necessary for professional practice;
14. An ability to apply design and development principles in the construction of software systems of varying complexity.

Subject Code &Name - <u>314441 Theory Of Computation</u>

Course Objectives

1. To understand problem classification and problem solving by machines.
2. To understand the basics of automata theory and its operations.
3. To study computing machines by describing, classifying and comparing different types of computational models.
4. Encourage students to study theory of computability and complexity.
5. To understand the P and NP class problems and its classification.
6. To understand the fundamentals of problem decidability and reducibility.

Course Outcomes

On completion of the course, learner will be able to

1. To construct finite state machines to solve problems in computing.
2. To write mathematical expressions for the formal languages
3. To apply well defined rules for syntax verification.
4. To construct and analyze Push Down, Post and Turing Machine for formal languages.
5. To express the understanding of the decidability and decidability problems.
6. To express the understanding of computational complexity.

Subject Code &Name - 314442 Database Management Systems

Course Objectives

1. To understand the fundamental concepts of database management. These concepts include aspects of database design, database languages, and database-system implementation.
1. To provide a strong formal foundation in database concepts, technology and practice.
2. To give systematic database design approaches covering conceptual design, logical design and an
3. overview of physical design.
4. To be familiar with the basic issues of transaction processing and concurrency control.
5. To learn and understand various Database Architectures and Applications.
6. To understand how analytics and big data affect various functions now and in the future.

Course Outcomes

On completion of the course, learner will be able to

1. To define basic functions of DBMS & RDBMS.
2. To analyze database models & entity relationship models.
3. To design and implement a database schema for a given problem-domain.
4. To populate and query a database using SQL DML/DDL commands.
5. Do Programming in PL/SQL including stored procedures, stored functions, cursors and packages.
6. To appreciate the impact of analytics and big data on the information industry and the external ecosystem for analytical and data services.

Subject Code &Name - 314443 Software Engineering and Project Management

Course Objectives

1. To understand the nature of software complexity in various application domains, disciplined way of software development and software lifecycle process models.
2. To introduce principles of agile software development, the SCRUM process and agile practices.
3. To know methods of capturing, specifying, visualizing and analyzing software requirements.
4. To understand project management through life cycle of the project.
5. To understand current and future trends and practices in the IT industry.
6. To learn about project planning, execution, tracking, audit and closure of project.

Course Outcomes

On completion of the course, learner will be able to

1. To identify unique features of various software application domains and classify software applications.

2. To choose and apply appropriate lifecycle model of software development.
3. To describe principles of agile development, discuss the SCRUM process and distinguish agile process model from other process models.
4. To analyze software requirements by applying various modeling techniques.
5. To list and classify CASE tools and discuss recent trends and research in software engineering.
6. To understand IT project management through life cycle of the project and future trends in IT Project Management.

Subject Code &Name - 314444: Operating System

Course Objectives

1. To introduce basic concepts and functions of modern operating systems.
2. To understand the concept of process and thread management.
3. To understand the scheduling of processes and threads.
4. To understand the concept of concurrency control.
5. To understand the concept of I/O and File management.
6. To understand various Memory Management techniques.

Course Outcomes

On completion of the course, learner will be able to

1. Fundamental understanding of the role of Operating Systems.
2. To understand the concept of a process and thread.
3. To apply the cons of process/thread scheduling.
4. To apply the concept of process synchronization, mutual exclusion and the deadlock.
5. To realize the concept of I/O management and File system.
6. To understand the various memory management techniques.

Subject Code &Name - 314445 Human-Computer Interactions

Course Objectives

1. To introduce to the field of human-computer-interaction study.
2. To gain an understanding of the human part of human-computer-interactions.
3. To learn to do design and evaluate effective human-computer-interactions.
4. To study HCI models and theories.
5. To understand HCI design processes.
6. To apply HCI to real life use cases.

Course Outcomes

On completion of the course, learner will be able to

1. To explain importance of HCI study and principles of user-centred design (UCD) approach.
2. To develop understanding of human factors in HCI design.
3. To develop understanding of models, paradigms and context of interactions.
4. To design effective user-interfaces following a structured and organized UCD process.
5. To evaluate usability of a user-interface design.
6. To apply cognitive models for predicting human-computer-interactions.

Subject Code &Name - 314446 Software Laboratory - I

Course Objectives

1. Understand the fundamental concepts of database management. These concepts include aspects of database design, database languages, and database-system implementation.
2. To provide a strong formal foundation in database concepts, recent technologies and best industry practices.
3. To give systematic database design approaches covering conceptual design, logical design and an overview of physical design.
4. To learn the SQL and NoSQL database system.
5. To learn and understand various Database Architectures and its use for application development.
6. To programme PL/SQL including stored procedures, stored functions, cursors and packages.

Course Outcomes

On completion of the course, learner will be able to

1. To install and configure database systems.
2. To analyze database models & entity relationship models.
3. To design and implement a database schema for a given problem-domain
4. To understand the relational and document type database systems.
5. To populate and query a database using SQL DML/DDL commands.
6. To populate and query a database using MongoDB commands.

Subject Code &Name -314447: Software Laboratory – II

Course Objectives

1. To introduce and learn Linux commands required for administration.
2. To learn shell programming concepts and applications.

3. To demonstrate the functioning of OS basic building blocks like processes, threads under the LINUX.
4. To demonstrate the functioning of OS concepts in user space like concurrency control (process synchronization, mutual exclusion & deadlock) and file handling in LINUX.
5. To aware Linux kernel source code details.
6. To demonstrate the functioning of OS concepts in kernel space like embedding the system call in any LINUX kernel.

Course Outcomes

On completion of the course, learner will be able to

1. To understand the basics of Linux commands and program the shell of Linux.
2. To develop various system programs for the functioning of operating system.
3. To implement basic building blocks like processes, threads under the Linux.
4. To develop various system programs for the functioning of OS concepts in user space like concurrency control and file handling in Linux.
5. To design and implement Linux Kernel Source Code.
6. To develop the system program for the functioning of OS concepts in kernel space like embedding the system call in any Linux kernel.

Subject Code &Name - <u>314448 Software Laboratory – III</u>

Course Objectives

1. To understand the nature of software complexity in various application domains, disciplined way of software development and software life cycle process models.
2. To introduce principles of agile software development, the SCRUM process and agile practices.
3. To know methods of capturing, specifying, visualizing and analyzing software requirements.
4. To understand concepts and principles of software design and architecture.
5. To understand user-centric design approach.
6. To apply principles of designing for effective user interfaces.

Course Outcomes

On completion of the course, learner will be able to

1. To identify the needs of users through requirement gathering.
2. To apply the concepts of Software Engineering process models for project development.
3. To apply the concepts of HCI for user-friendly project development.
4. To deploy website on live webserver and access through URL.
5. To understand, explore and apply various web technologies.

6. To develop team building for efficient project development.

Subject Code &Name - <u>Digital & Social Media Marketing</u>

Course Objectives

1. Get strategic understanding of Digital Marketing and Social Media Marketing.
2. Understand how to use it for branding and sales.
3. Understand its advantages & limitations.
4. Become familiar with Best Practices, Tools & Technologies.
5. Blend digital and social marketing with offline marketing.
6. Plan and manage digital marketing budget.
7. Manage Reporting & Tracking Metrics.
8. Understand the future of Digital Marketing and prepare for it.

Course Outcomes

On completion of the course, learner will be able to

1. Develop a far deeper understanding of the changing digital landscape.
2. Identify some of the latest digital marketing trends and skill sets needed for today's marketer.
3. Successful planning, prediction, and management of digital marketing campaigns.
4. Implement smart management of different digital assets for marketing needs.
5. Assess digital marketing as a long term career opportunity.

SEM II

Subject Code &Name – 314450 Computer Network Technology

Course Objectives

1. To understand services offered at different layers of network.
2. To understand protocol used at different layers of network.
3. To fathom wireless network and different wireless standards.
4. To recognize differences in between different wireless networks and to learn different mechanism used at layers of wireless network.
5. To know the applications of network and use the understood concepts for new application development.
6. To explore recent trends in networking.

Course Outcomes

On completion of the course, learner will be able to

1. To know Responsibilities, services offered and protocol used at each layer of network.
2. To understand different addressing techniques used in network.
3. To know the difference between different types of network.
4. To know the different wireless technologies and IEEE standards.
5. To use and apply the standards and protocols learned, for application development.
6. To understand and explore recent trends in network domain.

Subject Code &Name - 314451 Systems Programming

Course Objectives

1. To study and understand different system software like Assembler, Macro-processor and Loaders / Linkers.
2. To design and develop useful system software.
3. To study and understand compiler design.
4. To understand semantic analysis and storage allocation in compilation process.
5. To understand different code generation techniques.
6. To study different code optimization methods.

Course Outcomes

On completion of the course, learner will be able to

1. To learn independently modern software development tools and creates novel solutions for language processing applications.

2. To design and implement assemblers and macro processors.
3. To use tool LEX for generation of Lexical Analyzer.
4. To use YACC tool for generation of syntax analyzer.
5. To generate output for all the phases of compiler.
6. To apply code optimization in the compilation process.

Subject Code & Name-<u>314452 Design and Analysis of algorithms</u>

Course Objectives

1. To understand the problem solving and problem classification.
2. To know the basics of computational complexity analysis and various algorithm design strategies.
3. To provide students with solid foundations to deal with a wide variety of computational problems.
4. To provide a thorough knowledge of the most common algorithms and data structures.
5. To analyze a problem and identify the computing requirements appropriate for its solutions.
6. To understand the design of parallel algorithms.

Course Outcomes

On completion of the course, learner will be able to

1. To calculate computational complexity using asymptotic notations for various algorithms.
2. To apply Divide & Conquer as well as Greedy approach to design algorithms.
3. To practice principle of optimality.
4. To illustrate different problems using Backtracking.
5. To compare different methods of Branch and Bound strategy.
6. To explore the concept of P, NP, NP-complete, NP-Hard and Parallel algorithms.

Subject Code &Name - <u>314453 Cloud Computing</u>

Course Objectives

1. To become familiar with Cloud Computing and its ecosystem.
2. To learn basics of virtualization and its importance.
3. To evaluate in-depth analysis of Cloud Computing capabilities.
4. To give technical overview of Cloud Programming and Services.
5. To understand security issues in cloud computing.
6. To be exposed to Ubiquitous Cloud and Internet of Things.

Course Outcomes

On completion of the course, learner will be able to

1. To understand the need of Cloud based solutions.
2. To understand Security Mechanisms and issues in various Cloud Applications
3. To explore effective techniques to program Cloud Systems.
4. To understand current challenges and trade-offs in Cloud Computing.
5. To find challenges in cloud computing and delve into it to effective solutions.
6. To understand emerging trends in cloud computing.

Subject Code &Name -<u>314454 Data Science and Big Data Analytics</u>

Course Objectives

1. To introduce basic need of Big Data and Data science to handle huge amount of data.
2. To understand the basic mathematics behind the Big data.
3. To understand the different Big data processing technologies.
4. To understand and apply the Analytical concept of Big data using R and Python.
5. To visualize the Big Data using different tools.
6. To understand the application and impact of Big Data.

Course Outcomes

On completion of the course, learner will be able to

1. To understand Big Data primitives.
2. To learn and apply different mathematical models for Big Data.
3. To demonstrate their Big Data learning skills by developing industry or research applications.
4. To analyze each learning model come from a different algorithmic approach and it will perform differently under different datasets.
5. To understand needs, challenges and techniques for big data visualization.
6. To learn different programming platforms for big data analytics.

Subject Code &Name - <u>314455 Software Laboratory – IV</u>

Course Objectives

1. To design and implement small size network and to understand various networking commands
2. To provide the knowledge of various networking tools and their related concepts
3. To understand various application layer protocols for its implementation in client/server environment
4. To understand network layer protocols and its implementations.
5. To explore and understand various simulations tools for network applications.

6. To understand the fundamentals of wireless networks and standards.

Course Outcomes

On completion of the course, learner will be able to

1. To implement small size network and its use of various networking commands.
2. To understand and use various networking and simulations tools.
3. To configure various client/server environments to use application layer protocols
4. To understand the protocol design at various layers.
5. To explore use of protocols in various wired and wireless applications.
6. To develop applications on emerging trends.

Subject Code &Name – 314456 Software Laboratory - V

Course Objectives

1. To learn the concepts of assembler to design and implement two pass assembler.
2. To study use of macros and its expansion process.
3. To understand lexical analyzer and parser and its applications in compiler design.
4. To learn the various algorithmic design paradigms.
5. To apply appropriate algorithmic strategy in problem solving.
6. To find the space and running time requirements of the algorithms.

Course Outcomes

On completion of the course, learner will be able to

1. To design and implement two pass assembler for hypothetical machine instructions.
2. To design and implement different phases of compiler (Lexical Analyzer, Parser, Intermediate code generation)
3. To use the compile generation tools such as “Lex" and "YACC”.
4. To apply algorithmic strategies for solving various problems.
5. To compare various algorithmic strategies.
6. To analyze the solution using recurrence relation.

Subject Code &Name-314457 Software Laboratory - V

Course Objectives

1. To understand Big data primitives and fundamentals.
2. To understand the different Big data processing techniques.
3. To understand and apply the Analytical concept of Big data using R/Python.

4. To understand different data visualization techniques for Big Data.
5. To understand the application and impact of Big Data
6. To understand emerging trends in Big data analytics

Course Outcomes

On completion of the course, learner will be able to

1. To apply Big data primitives and fundamentals for application development.
2. To explore different Big data processing techniques with use cases.
3. To apply the Analytical concept of Big data using R/Python.
4. To visualize the Big Data using Tableau.
5. To design algorithms and techniques for Big data analytics.
6. To design Big data analytic application for emerging trends.

Subject Code &Name- <u>Project Based Seminar</u>

Course Objectives

1. To perform focused study of technical and research literature relevant to a specific topic.
2. To study, interpret and summarize literature scientifically.
3. To build independent thinking on complex problems.
4. To build collaborative work practices.
5. To communicate scientific information to a larger audience in oral and written form.
6. To use presentation standards and guidelines effectively.

Course Outcomes

On completion of the course, learner will be able to

1. To Gather, organize, summarize and interpret technical literature with the purpose of formulating a project proposal.
2. To write a technical report summarizing state-of-the-art on an identified topic.
3. Present the study using graphics and multimedia presentations.
4. Define intended future work based on the technical review.
5. To explore and enhance the use of various presentation tools and techniques.
6. To understand scientific approach for literature survey and paper writing.

Subject Code &Name-<u>314459: Intellectual Property Rights and Patenting</u>

Course Objectives

1. To gain the knowledge of the different types of Intellectual Property Rights (IPR).

2. To understand Trademark, Industrial Designs, Copyright and Trade Secret.
3. To learn about Patenting Systems in the World – USPTO, EPO.
4. To get Knowledge of Indian Patenting System – IPO.
5. To learn and understand different types of Contracts and Licensing and Open Source Software.

Course Outcomes

1. To understand Intellectual Property Rights (IPR).
2. To explore applications of Trademark, Industrial Designs, Copyright and Trade Secret.
3. To understand function of USPTO, EPO.
4. To know the process of filing patent with IPO.
5. To understand the process of copyright and licensing.

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