



SOLAPUR UNIVERSITY, SOLAPUR
FACULTY OF ENGINEERING & TECHNOLOGY
Information Technology

Programme Educational Objectives and Outcomes

A. Program Educational Objectives

1. To provide students with a sound foundation in the mathematics, science & technology, necessary to analyze & solve real world problems and to prepare them for Graduate studies and research.
2. To develop the ability among students to gain knowledge about core and application domain subjects in IT, use them to analyze & design real world and engineering problems, strengthening them with latest technologies exhibiting modernization of engineering practices.
3. To provide students necessary background to design a system, component or process to meet desired needs keeping in to account the economic, environmental, social, political, health & safety, manufacturability and sustainable factors.
4. To provide opportunity for students to work as part of teams on various projects which are multidisciplinary in nature requiring logical and programming skills.
5. To promote student awareness for life-long learning and to introduce them to professional ethics to build a good social personality.
6. To build communication & presentation skills required to represent innovative ideas more effectively.

B. Program Outcomes

- a. An ability to apply knowledge of mathematics, science, and engineering.
- b. An ability to design and conduct experiments, as well as to analyze and interpret data.
- c. An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.
- d. An ability to function on multidisciplinary teams.
- e. An ability to identify, formulates, and solves engineering problems.
- f. An understanding of professional and ethical responsibility.
- g. An ability to communicate effectively.
- h. The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context,
- i. A recognition of the need for, and an ability to engage in life-long learning,
- j. A knowledge of contemporary issues, and
- k. An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

Program Specific Outcomes (PSOs)

The program shall enable students to attain, by the time of graduation:

1. Get acquainted and apply fundamentals of mathematics, science and core information technologies and become aware of the processes that support the delivery and management of information systems within a specific application environment.
2. An ability to identify and analyze user needs and take them into account in the selection, creation, evaluation and administration of computer-based systems appending them with the ability to use and apply latest technologies and tools in the core information technologies with following best practices and standards
3. An ability to effectively integrate IT-based solutions into the user environment.
4. Live and work as a contributing, well rounded member of society.

INFORMATION TECHNOLOGY

S.E. IT - I

IT211. APPLIED MATHEMATICS-I

At the end of course, students will be able to

1. Solve higher order linear differential equation with constant coefficient
2. Apply Laplace and inverse Laplace transforms for solving linear differential equations.
3. Express a function in terms of sine's and cosines components so as to model simple periodic functions.
4. Solve problems on Z transform and explain its properties
5. Find the relation between two variables for the given data using regression
6. Sketch and explain various probability distribution functions
7. Solve problems based on queuing theory

IT212. DISCRETE MATHEMATICAL STRUCTURE

At the end of course, students will be able to

1. Use connectives and develop well formed formulas and find the equivalence of formulas.
2. Convert given formula into its equivalent normal form.
3. Validate inferences for the given premises.
4. Apply set theory and relations to draw conclusions.
5. Define the function and apply it to different scenarios where functions can be used.
6. Demonstrate algebraic system and its properties, classifying them into semigroups, monoids and groups.
7. Generate group codes for 1 bit error detection and correction.
8. Identify and classify different types of Lattices and demonstrate Boolean algebra with its properties.

Course Outcomes

IT213. DATA COMMUNICATION

At the end of course, students will be able to

1. Send data through various data communication modes.
2. Differentiate between the OSI reference model and TCP/IP model.
3. Identify and classify different physical media and devices.
4. Demonstrate functions of Data Link Layer.
5. Simulate different routing algorithms in Network Layer.

IT214. DIGITAL LOGIC DESIGN

At the end of course, students will be able to

1. Apply the concepts of various number systems, Boolean algebra to solve relevant problems.
2. Design digital logic circuits.
3. Design and implement combinational logic circuits and sequential circuits.
4. Simulate different logic circuits using Hardware Description Language (HDL).

IT215. COMPUTER GRAPHICS

At the end of course, students will be able to

1. Draw graphical elements using built-in graphic functions in 'C'.
2. Differentiate different graphical devices.
3. Draw lines, Circles and fill polygons.
4. Apply simple 2D and 3D transformations to given object.
5. Demonstrate different clipping algorithms, surfaces and different types of curves.
6. Create simple 2D animations.

IT216. PROGRAMMING IN C

At the end of course, students will be able to

1. Define, use and compare storage classes in C.
2. Develop recursive solutions for given problems.

Course Outcomes

3. Apply file, pointer concepts and string functions for given problem statements.
4. Implement linear, binary searching and hashing techniques.
5. Implement different sorting algorithms like bubble sort, insertion sort, quick sort and merge sort.

S.E. IT - II

IT221. APPLIED MATHEMATICS-II

At the end of course, students will be able to

1. Use the concept of uncertainty to solve problems.
2. Apply knowledge of basics of fuzzy set theory to solve problems.
3. Illustrate fuzzification.
4. Use knowledge of numerical methods to solve more complex problems of the real world.
5. Evaluate a particular kind of problems arising in day to day life using simplex method and Assignment Problems.

IT222. THEORY OF COMPUTATION

At the end of course, students will be able to

1. Build regular expression for a given language.
2. Design different types of automata.
3. Classify languages as regular and non regular language.
4. Detect ambiguity in a grammar and convert into unambiguous grammar and normal forms.
5. Design pushdown automata and Turing machine for a given language.

IT223. MICROPROCESSORS

At the end of course, students will be able to

1. Demonstrate the basic microprocessor architecture and its functionality.
2. Write and implement simple assembly language programs.

Course Outcomes

3. Write and implement simple assembly language programs for interfacing.
4. Differentiate between 8086, 80286, 80386 and 80486 microprocessors.

IT224. DATA STRUCTURES

At the end of course, students will be able to

1. Demonstrate and differentiate between different data structures.
2. Demonstrate Programming skills to implement different data structures by using various C language features.
3. Identify specific data structure to solve given problem

IT225. COMPUTER NETWORKS

1. Identify different addressing modes using IPv4.
2. Implement client-server paradigm for socket interfaces using UDP, TCP & SCTP.
3. Use different functions of application layer protocols like DNS , FTP , Email and TELNET

IT226. OBJECT ORIENTED PROGRAMMING THROUGH C++

At the end of course, students will be able to

1. Illustrate principles of OOPS : Data Abstraction, Polymorphism, Inheritance and File Handling.
2. Implement OOPs Concepts through C++ programs.
3. Identify the applications of OOPS concepts for a given problem.

Course Outcomes

T.E. IT -I

IT311.Network Management

At the end of course, students will be able to

1. Identify various networking protocols.
2. Acquainted with the basic layers & functions of TCP/IP protocol.
3. Implement various network management systems using SNMP.

IT312.Computer Organization & Architecture

At the end of course, students will be able to

1. Identify the major components of a computer including CPU, memory, I/O and storage.
2. Carry on cost performance analysis and design prototypes for computers.
3. Acquainted with assembly language programming of SPARC Processor & use of cache memory.

IT313. SYSTEM SOFTWARE

At the end of course, students will be able to

1. Ability to identify Language Processors.
2. Analyze, Synthesize and Design language Processors.
3. Use Language Processor Development Tools.

IT314. PRINCIPLES OF OPERATING SYSTEMS

At the end of course, students will be able to

1. Exhibit the principles of operating systems through simulations.
2. Specify the functions of various components of operating systems.
3. Analyze and design prototypes to exhibit different memory management schemes.

Course Outcomes

IT315. DESIGN & ANALYSIS OF ALGORITHMS

At the end of course, students will be able to

1. Find step count of a given algorithm.
2. Find time & space complexity of an algorithm in terms of asymptotic notations.
3. Compare algorithms based on complexities.
4. Apply the knowledge of standard algorithm methods to solve a given problem statement.
5. Decide an algorithm devising method for a given real world problem & develop the necessary algorithm.

IT316. Java Programming

At the end of course, students will be able to

1. Acquainted with the features of Java programming language.
2. Apply principle of OOP concepts and explore their skills to develop a complex java program.
3. Implement GUI based applications using Java programming.

SEMESTER – II

IT321. DATABASE ENGINEERING

At the end of course, students will be able to

1. Apply the basic concepts of relational data model, entity-relationship model, relational database design, relational algebra and SQL.
2. Design E-R diagrams to represent simple database for any real time application and formulate SQL queries on it.
3. Apply analyze a database design and improve the design by normalization.
4. Apply demonstrate knowledge of ACID properties of a transaction and several techniques of concurrency control.

Course Outcomes

IT322. OBJECT ORIENTED MODELING AND DESIGN

At the end of course, students will be able to

1. Demonstrate the knowledge and ability to show the importance of systems analysis and design in solving complex problems.
2. Show how the object-oriented approach differs from the traditional approach to systems analysis and design.
3. Explain the importance of modeling and how Object Modeling Technique (OMT) and the Unified Modeling Language (UML) represents an object-oriented system using a number of modeling views.
4. Construct various OMT & UML models for representing and analyzing real world problems.

IT323.UNIX OPERATING SYSTEM CONCEPTS

At the end of course, students will be able to

1. Acquainted with the basic Unix commands at Shell and Kernel level.
2. Analyze, design and develop Applications in Unix environments.
3. Acquainted with the internals of Unix OS.

IT324.SOFTWARE ENGINEERING

At the end of course, students will be able to

1. Select proper software life cycle model for design and development.
2. Prepare prototype models using standard modeling languages.
3. Focus on the fundamentals of developing a Software Project.
4. Get Software Requirement Specification from client, analyze, design and estimate the cost of development of a Software Project.

Course Outcomes

IT325. MOBILE APPLICATION DEVELOPMENT

At the end of course, students will be able to

1. Familiarize with mobile apps development aspects.
2. To design & develop mobile apps, using Android as a development platform.
3. To perform testing, signing, packaging and distribution of mobile apps.

IT326. ADVANCED JAVA

At the end of course, students will be able to

1. Acquainted with the advanced features of Java programming language.
2. Able to implement database based applications using Java programming.
3. Develop networking, distributed and web applications.



Course Outcomes

IT327. SEMINAR

At the end of course, students will be able to

- 1.Acquainted with an existing or a new technology.
- 2.Exhibit good communication & presentation skills.
- 3.Discuss, brainstorm & work in teams.

IT328. SELF LEARNING MODULE-II: HSS/TECHNICAL

A. NETWORK SETUP AND MANAGEMENT

At the end of course, students will be able to

1. Students will be to identify various networking devices.
2. Students will be able to setup and manage the computer network.

B. TOOLS FOR COMPUTER ARCHITECTURE

At the end of course, students will be able to

1. Practice gate level design to CPU design.
2. Identify, formulate and solve advanced computer architecture problems

C. COMPILER DEVELOPMENT TOOLS

At the end of course, students will be able to

1. Describe stages of compilation.
2. Code lexical analyzer using a tool.
3. Code parser using a tool.

Course Outcomes

B.E. IT - I

IT411.HUMAN COMPUTER INTERACTION

At the end of course, students will be able to

1. Apply knowledge of human components functions regarding interaction with computer.
2. Apply design rules, produce implementation supports and use evaluation techniques.
3. Analyze and design human computer interfaces.

IT412.MANAGEMENT INFORMATION SYSTEMS

At the end of course, students will be able to

1. Get acquainted with the basic infrastructure and strategies used in information systems.
2. Analyze requirements and design information systems using principles of communication technologies.
3. Be able to implement the previously created designs as models of information systems.

IT413. ADVANCED DATABASE SYSTEMS

At the end of course, students will be able to

1. Differentiate between Distributed & Parallel databases.
2. Implement object oriented databases, mining concepts.
3. Implement different query processing algorithms.
4. Tabulate SQL, NoSQL & New SQL with its applications.
5. Articulate technologies like Hadoop, MongoDB+

IT414. SOFTWARE TESTING AND QUALITY ASSURANCE

At the end of course, students will be able to

1. Detect and rectify software bugs.
2. Test software to meet requirements of quality.
3. Generate test cases and plans.
4. Assess software quality and assurance based on standards.
5. Use testing tools to test software in order to improve test efficiency.



Course Outcomes

IT415. ELECTIVE - I:

A. FUZZY & NEURAL NETWORKS

At the end of course, students will be able to

1. Implement numerical methods in soft computing
2. Apply the fuzzy set theory
3. Apply derivative based and derivative free Optimization
4. Apply the neural networks and supervised and unsupervised learning networks
5. Comprehend neuro-fuzzy modeling
6. Demonstrate some applications of computational intelligence

B. DISTRIBUTED COMPUTING

At the end of course, students will be able to

1. Differentiate between Distributed Operating System & other OS.
2. Implement Process Synchronization Through RPC & Message Passing.
3. Detect & prevent deadlocks using different algorithms.
4. To manage files in Distributed environment.

C. IMAGE PROCESSING

At the end of course, students will be able to

1. Apply different transforms to images.
2. Enhance images using different masks.
3. Restore original image using different techniques.
4. Compress image using lossy or lossless compression techniques.
5. Segment images and find edges or regions.
6. Find different image descriptors.

Course Outcomes

D. MICROCONTROLLER AND EMBEDDED SYSTEMS

At the end of course, students will be able to

1. Learn importance of microcontroller in designing embedded application.
2. Program microcontroller.
3. Design conceptual embedded system.
4. Develop interfacing to real world devices.

IT416. PROGRAMMING IN C#.NET

At the end of course, students will be able to

1. Use .NET Framework in building robust software applications using C# programming language.
2. Design and develop Object Oriented concepts, GUI and Web application on Windows platform.

IT417. PROJECT-I

At the end of course, students will be able to

1. Define a realistic problem statement.
2. Select & apply an appropriate technique to create a design.
3. Work in teams with good coordination.
4. Present their work through oral communication & writing skills.

SEMESTER – II

IT421. INFORMATION RETRIEVAL

At the end of course, students will be able to

1. Implement text retrieval models like Boolean, vector and probabilistic and structured retrieval model.
2. Evaluate the performance of information retrieval systems.
3. Implement different querying patterns in retrieval models.
4. Implement different indexing structure like inverted index, hash files, suffix arrays for given collection of documents.

Course Outcomes

5. Implement different sequential searching algorithms and pattern matching algorithms.
6. Implement multimedia IR system and indexing on multimedia data.
7. Implement different ranking algorithms to find ranking of the documents.
8. To design and develop information retrieval systems.

IT422. MOBILE COMPUTING & APPLICATION

At the end of course, students will be able to

1. acquainted with basic of wireless and mobile technology
2. design modulation techniques
3. design different sensor, Adhoc and wireless network

IT423. INFORMATION ASSURANCE AND SECURITY

At the end of course, students will be able to

1. Classify Secret and Public Key Cryptography
2. Implement cryptography algorithms.
3. Illustrate Security protocols for Network and Transport layer.
4. Apply and design security prevention and detection techniques.
5. Experiment various tools and methods used in cyber crime.

IT424. ELECTIVE II:

A. DATA MINING & WAREHOUSING

At the end of course, students will be able to

1. Design a data mart or data warehouse for any organization
2. Develop skills to write queries using DMQL
3. Adapt to new data mining tools
4. Extract knowledge using data mining techniques
5. Explore recent trends in data mining such as web mining, spatial-temporal mining

Course Outcomes

B. PATTERN RECOGNITION

At the end of course, students will be able to

1. Identify and analyze patterns from the real world data.
2. Implement techniques for pattern classification.
3. Implement techniques for pre-processing feature selection and syntactic pattern recognition

C. BUSINESS INTELLIGENCE

At the end of course, students will be able to

1. Demonstrate concepts of business intelligence and data mining.
2. Apply theoretical and practical skills to address different data types.
3. Apply data mining techniques in business context.
4. Design a data model and use relevant techniques for data analysis.
5. Implement conventional data mining software, and evaluate its strength and limitations.

D. CLOUD COMPUTING

At the end of course, students will be able to

1. Differentiate cloud computing services.
2. Demonstrate the core issues of cloud computing.
3. Select the appropriate technologies, algorithms, and approaches for specific problems.

IT425. WEB TECHNOLOGY

At the end of course, students will be able to

1. Acquainted with basics of web and its component.
2. Design and develop a website.
3. Develop dynamic website by using web technologies .
4. Able to develop efficient and light weight web applications.

Course Outcomes

IT426. PROJECT-II

At the end of course, students will be able to

1. Apply engineering knowledge for arriving at a solution.
2. Select & apply an appropriate technology to develop a project.
3. Work in teams with good coordination.
4. Present their work through oral communication & writing skills.

