Walchand Institute of Technology, Solapur
Computer Science & Engineering Department
Information Technology Program

Vision, Mission & Program Educational Objectives (PEOs)

Vision of the Department –

To produce globally competent engineers in Computer Engineering and allied fields, who will aim at overall sustainable development of the society.

Mission of the Department –

1. To impart quality education in the field of Computer Engineering allied fields and allied fields in accordance with the needs of the society through technology enabled education.
2. To inculcate lifelong learning in students to face challenges posed by ever-changing IT career landscape as a disciplined professional with a sense of professional ethics.
3. To inculcate critical thinking and creativity for identifying various societal issues and to provide solutions.
4. To enhance career opportunities for students through academia-industry interaction and research.

Program Educational Objectives (PEOs)-

1. Graduates will exhibit strong fundamental knowledge and skills in the field of Information Technology to pursue successful professional careers , higher studies and research..
2. Graduates will exhibit capabilities to understand and resolve the various issues through their problem solving skills..
3. Graduates will be sensitive to ethical, societal and environmental issues while serving at their professional work and society..

Program Specific Outcomes (PSOs)

1. **PSO1:** Students will be able to apply fundamentals of mathematics, algorithms and computational systems to Information technology.
2. **PSO2:** Students will be able to provide a solution to the problem in the areas of Networking, Database management, System Software, Web Technology, Information Security and Thrust areas..
3. **PSO3:** Students will be able to design and develop IT solution for societal problem/s, while encouraging usage of Free and Open Source Software (FOSS)

Walchand Institute of Technology, Solapur
Program Information Technology
2019-20

- **IT211 Applied Mathematics-I – Course Outcomes**

At the end of this course, Students will be able to,

IT211.1	Solve higher order linear differential equation with constant coefficient.
IT211.2	Apply Laplace and inverse Laplace transforms for solving linear differential equations.
IT211.3	Express a function in terms of sine's and cosines components so as to model simple periodic functions
IT211.4	Solve problems on Z transform and explain its properties
IT211.5	Find the relation between two variables for the given data using regression and explain various probability distribution functions
IT211.6	Solve problems based on queuing theory

- **IT212 Discrete Mathematical Structure – Course Outcomes**

At the end of this course, Students will be able to,

IT212.1	Arrive at an inference from the given premises applying mathematical logic.
IT212.2	Demonstrate principles of set theory, relations and functions
IT212.3	Classify algebraic systems based on its properties and select appropriate for given Application

- **IT213 Data Communication – Course Outcomes**

At the end of this course, Students will be able to,

IT213.1	Identify communication modes & network reference models for communication.
IT213.2	Implement data transfer using Data Link Layer functions.
IT213.3	Select medium access, IEEE standards and devices for communication.
IT213.4	Simulate & analyze functionalities of network layer routing algorithms.

- **IT214 Digital Techniques – Course Outcomes**

At the end of this course, Students will be able to,

IT214.1	Apply the fundamentals of various number systems, Boolean algebra to solve relevant problems
IT214.2	Design and implement combinational and sequential logic circuits.
IT214.3	Simulate different logic circuits using Hardware Description Language (HDL).

- **IT215 Computer Graphics – Course Outcomes**

At the end of this course, Students will be able to,

IT215.1	Implement algorithms to scan convert line, circle and polygon filling.
IT215.2	Apply 2D and 3D transformations to graphic primitives
IT215.3	Demonstrate algorithms for line clipping, visible lines and surfaces algorithms
IT215.4	Incorporate built-in graphics functions for designing Animation

- **IT216 Advanced C Concepts – Course Outcomes**

At the end of this course, Students will be able to,

IT216.1	Use storage classes and preprocessors in C programs
IT216.2	Develop solutions using recursion for given problems
IT216.3	Apply pointers, string functions and file handling techniques for problem solving
IT216.4	Implement searching, sorting and hashing techniques using C.

- **IT221 Applied Mathematics-II – Course Outcomes**

At the end of this course, Students will be able to,

IT221.1	Solve nonlinear algebraic and transcendental equations
IT221.2	Solve simultaneous linear and nonlinear equations.
IT221.3	Apply numerical methods to evaluate definite integrals.
IT221.4	Apply knowledge of basics of fuzzy set theory to solve the problems.
IT221.5	Solve the fuzzy equations
IT221.6	Solve a particular kind of problems arises in day to day life using simplex method and Assignment Problems.

- **IT222 Theory of Computation – Course Outcomes**

At the end of this course, Students will be able to,

IT222.1	Build regular expression for a given language
IT222.2	Design an automata for given formal languages
IT222.3	Classify a given language into regular and non-regular language
IT222.4	Detect ambiguity in grammar and remove it.
IT222.5	Design abstract machines for a given language

- **IT223 Microprocessors – Course Outcomes**

At the end of this course, Students will be able to,

IT223.1	Demonstrate the architecture and its functionality for various Intel family microprocessors
IT223.2	Implement assembly language programs for 8086 microprocessor
IT223.3	Illustrate interfacing of various peripheral devices with 8086 microprocessor
IT223.4	Describe the use of system bus in case of single and multiprocessor environments

- **IT224 Data Structures – Course Outcomes**

At the end of this course, Students will be able to,

IT224.1	Describe and distinguish linear and non-linear data structures
IT224.2	Implement various data structures and perform its various operations using C
IT224.3	Select appropriate data structures for solving a given problem using C programming.

- **IT225 Computer Networks – Course Outcomes**

At the end of this course, Students will be able to,

IT225.1	Describe different classes of addressing and select appropriate while designing a LAN .
IT225.2	Implement client-server paradigm for socket interfaces using transport layer protocols
IT225.3	Select & use appropriate application layer protocols for given problem

- **IT226 Object Oriented Programming Through C++ – Course Outcomes**

At the end of this course, Students will be able to,

IT226.1	Implement Object Oriented Programming constructs & features using C++.
IT226.2	Implement File Handling Operations in C++.
IT226.3	Implement C++ program using templates
IT226.4	Develop solutions using Object Oriented Programming.

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- **IT311 Principles of Operating System – Course Outcomes**

At the end of this course, Students will be able to

IT311.1	Describe features of Operating Systems.
IT311.2	Simulate algorithms for process scheduling, synchronization and Deadlock.
IT311.3	Implement algorithms for memory management.

- **IT312 System Software– Course Outcomes**

At the end of this course, Students will be able to

IT312.1	Describe the various System Software and Simulate using a programming language.
IT312.2	Demonstrate and distinguish logical design perspective of System Software.
IT312.3	Use Language Processor Development Tools to build System software.

- **IT313 Design and Analysis of Algorithms–Course Outcomes**

At the end of this course, students will be able to

IT313.1	Compute space & time complexity of an algorithm in terms of asymptotic notations.
IT313.2	Analyze algorithms considering time and space complexity to identify/arrive at efficient algorithms.
IT313.3	Use various standard algorithm design techniques for problem solving.
IT313.4	Select an appropriate design technique to develop an algorithm to a real world problem.

- **IT314 Database Engineering– Course outcomes**

At the end of this course student will be able to

IT314.1	Demonstrate basics of database systems and design database using Entity-relationship model for real time application.
IT314.2	Design database using relational model for real time application and Formulate SQL.
IT314.3	Analyze a database design & apply normalization.
IT314.4	Create ordered, hash indices for faster retrieval, and differentiate their advantages and limitations.
IT314.5	Apply transaction management for maintaining database consistency

- **IT315. Computer Organization and Architecture-Course Outcomes**

At the end of the course, students will be able to,

It315.1	Describe the functional architecture of computing systems.
It315.2	Analyze various algorithms for arithmetic computation and arrive at fastest one.
IT315.3	Use ARC Processor based instructions to write assembly language program.
IT315.4	Demonstrate the design aspects of memory, instruction level parallelism and multiprocessors.

- **IT316 : Java Programming -Course Outcomes**

At the end of the course, students will be able to,

IT316.1	Implement Object Oriented features and server-side programming.
IT316.2	Use Java runtime library APIs for implementing various functionality of various applications.
IT316.3	Select appropriate Java runtime library APIs to create GUI and web application using Java language.

- **IT 317 : Self Learning Module-I: Technical English for engineers -Course Outcomes**

At the end of the course, students will be able to,

IT317.1	Demonstrate details about English grammar.
IT317.2	Work on their vocabulary development by listening to audio, media etc.,
IT317.3	Develop basic communication skills in English.
IT317.4	Inculcate the habit of reading to improve their general knowledge
IT317.5	Refine their writing skills through formal letters, essay writing, and e-mails.

- **IT321 – Unix Operating System Course Outcomes**

At the end of the course, students will be able to

IT321.1	Describe the structure of the UNIX operating system
IT321.2	Use various basic UNIX Utilities
IT321.3	Analyze process management using various System calls.
IT321.4	Demonstrate Memory management policies and I/O management.

- **IT322 Software Engineering– Course Outcomes**

At the end of the course students will be able to

IT322.1	Describe various software life cycle models and select appropriate model for development of project.
IT322.2	Arrive at Software Requirement Specification document (SRS) and design document for a given problem.
IT322.3	Apply software design techniques and project planning for software development.

- **IT323 Object Oriented Modeling and Design– Course Outcomes**

At the end of this course, student will able to

IT323.1	Demonstrate basics of Object Oriented Modeling.
IT323.2	Design models for real world problems using Object Modeling Technique.
IT323.3	Design UML Diagrams. for real world problems

- **IT324: Artificial Intelligence– Course Outcomes**

At the end of this course, student will able to

IT324.1	Demonstrate fundamentals of Artificial intelligence and their probable applications.
IT324.2	Select an appropriate problem solving method and knowledge representation technique for a given problem.
IT324.3	Analyze the advantages and limitations of various search algorithms for problem solving.
IT324.4	Design models for reasoning with uncertainty as well as the use of unreliable information.
IT324.5	Develop applications for real world problems using artificial intelligence.

- **IT325: Mobile Application Development. – Course Outcomes**

At the end of this course, student will able to

IT325.1	To study the basics of Android platform and get to understand the application lifecycle.
IT325.2	Design & develop mobile apps using Android development platform.
IT325.3	Describe and perform testing, signing and deploying (packaging and distribution) mobile apps.
IT325.4	Design & develop real-world problem based android application in team.

- **IT326: Python Programming - Course Outcomes**

At the end of this course, students will be able to

IT326.1	Apply procedural programming features and object oriented programming basics for problem solving.
IT326.2	Incorporate standard library packages in python for problem solving.
IT326.3	Develop Applications using GUI & Database programming.
IT326.4	Handle bugs using exceptions, debugging and testing the program.
IT326.5	Recognize the necessity of use of Python in software development.

- **IT327: Self Learning Network Set up and Management – Course Outcomes**

At the end of this course, student will able to

IT327.1	Describe and distinguish various networking devices.
IT327.2	Analyze network requirements and select appropriate router/s and routing protocol/s.
IT327.3	Use firewall and wireless standards for a given network.
IT327.4	Design network for different applications.
IT327.5	Identify appropriate IP addressing.

- **IT328: Seminar– Course Outcomes**

At the end of this course, student will able to

IT328.1	Explore research areas and conduct literature survey to decide seminar topic.
IT328.2	Compile information and knowledge effectively.
IT328.3	Effectively communicate their work in writing and oral presentation.
IT328.4	Inculcate habit of self-study and lifelong learning.

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- **IT411 Management of Information System -– Course Outcomes**

At the end of this course: student will able to,

IT411.1	Describe basics of infrastructure and strategies used in information systems
IT411.2	Gather & analyze requirements and design information systems using principles of communication technologies for a given problem.
IT411.3	Implement existing management information systems models for given domain

- **IT412 Advanced Database System –Course Outcomes**

At the end of this course, students will be able to

IT412.1	Describe & Implement Principles of Distributed database and parallization techniques of Parallel database.
IT412.2	Apply OLAP to data to view data in multiple dimensions and data mining algorithms for predictions.
IT412.3	Apply query evaluation and query optimization algorithms.
IT412.4	Demonstrate big data technologies.

- **IT413 Software Testing and Quality Assurance– Course outcomes**

At the end of this course student will be able to

IT413.1	Describe the various software testing types and select appropriate testing type.
IT413.2	Generate requirement based test cases by using black box and white box testing methods.
IT413.3	Demonstrate different approaches of Software Quality Assurance (SQA) and prepare SQA plan.
IT413.4	Use free open source software testing tools to test software.

- **IT414 Mobile Computing– Course Outcomes**

At the end of the course students will be able to

IT414.1	Demonstrate basics of wireless and sensor network
IT414.2	Describe various modulation & multiplexing techniques and select appropriate for mobile communication.
IT414.3	Describe various layers in GSM communication and its working

- **IT415A. Elective – I: Data Mining-Course Outcomes**

At the end of the course students will be able to,

IT415A.1	Apply data preprocessing methods for transforming raw data into interpretable format.
IT415A.2	Compare various data mining techniques to discover patterns and relationships in data for decision making
IT415A.3	Select an appropriate data mining algorithm to solve real world problem

- **IT415C. Elective-I Distributed Computing-Course Outcomes**

At the end of the course students will be able to,

IT415C.1	Describe fundamentals of distributed computing and its various models to select appropriate
IT415C.2	use process management & synchronization algorithms for inter process communication
IT415C.3	Analyze working of mutual exclusion and deadlock detection in distributed computing.
IT415C.4	Use of Distributed File System in Distributed application.

- **IT 416 : C# .Net - Course Outcomes**

At the end of the course students will be able to,

IT416.1	Demonstrate object oriented programming features with C#.
IT416.2	Implement file handling operations
IT416.3	Handle exceptions in C# programs
IT416.4	Develop Windows Applications with C#
IT416.5	Develop Web applications through ASP.NET And/or ADO.NET

- **IT 417 : Project-I -Course Outcomes**

At the end of the course students will be able to,

IT417.1	Explore research areas, conduct literature survey and formulate a problem statement catering societal/professional need.
IT417.2	Select an appropriate design with due consideration for society
IT417.3	Carry out impact analysis for environment and sustainability concern
IT417.4	Prepare Software requirement specification (SRS) & design document using software engineering techniques and modern tools.
IT417.5	Engage in team work and communicate effectively while observing professional ethics
IT417.6	Inculcate habit of self-study to become lifelong learner

- **IT 418 : Vocational Training -Course Outcomes**

At the end of the course students will be able to,

IT418.1	Use software development tools and techniques for real world problem
IT418.2	Effectively communicate a vocational training report in writing and oral presentation
IT418.3	Exhibit professional ethics.
IT418.4	Assimilate necessary skills and professional practices

- **IT421 – Information Retrieval-Course Outcomes**

At the end of the course students will be able to

IT421.1	Implement classic text and structured retrieval models and Evaluate the performance of information retrieval systems.
IT421.2	Build different indexing structure like inverted index, hash files, suffix arrays for given collection of documents.
IT421.3	Use various querying methods, sequential searching algorithms and pattern matching algorithms to search in text
IT421.4	Implement multimedia IR system and indexing on multimedia data.
IT421.5	Apply different ranking algorithms to find ranking of the documents

- **IT422 – Machine Learning-Course Outcomes**

At the end of the course students will be able to

IT422.1	Demonstrate types of machine learning algorithms
IT422.2	Design a model by selecting appropriate machine learning algorithm for a given problem.
IT422.3	Validate designed machine learning model
IT422.4	Evaluate and tune machine learning model based on various parameters.
IT422.5	Design various applications using machine learning algorithm

- **IT423 Information Assurance and Security– Course Outcomes**

At the end of this course, student will able to

IT423.1	Describe classical encryption techniques and cyber laws within the context of cyber security
IT423.2	Identify working principles of secret key and public key cryptography
IT423.3	Demonstrate Network and Transport layer communication standards/protocols for web security
IT423.4	Apply network security principles, authentication mechanism for secure data transmission
IT423.5	Select appropriate security service/s to prevent, detect and/or recover from a security attack.

- **IT424C: Elective –II Cloud Computing– Course Outcomes**

At the end of this course, student will able to

IT424C.1	Demonstrate the cloud computing architecture and various cloud service models.
IT424C.2	Identify the issues of cloud computing such as security, privacy, and interoperability.
IT424C.3	Choose the appropriate technologies, and approaches for the related issues.
IT424C.4	Provide the appropriate cloud computing solutions and recommendations according to the applications

- **IT424D: Internet of Things(IOT)– Course Outcomes**

At the end of this course, student will able to

IT424D.1	Interpret the characteristics and applications of IOT for deployment of the architectural model
IT424D.2	Compare smart objects and associated technologies for deployment in the network
IT424D.3	Analyze and choose the IoT protocol for efficient network communication
IT424D.4	Apply security concerns and challenges while implementing IOT solutions
IT424D.5	Provide the appropriate IOT solutions to the given problem

- **IT425: WEB TECHNOLOGY- Course Outcomes**

At the end of this course, student will able to

IT425.1	Design and develop web pages using HTML and CSS.
IT425.2	Analyze client/server side scripting technologies and select an appropriate one for given requirements of a web application.
IT425.3	Design and Develop web application using client/server side scripting technologies for a given problem.

- **IT426: Project-II - Course Outcomes**

At the end of this course, students will be able to

IT426.1	Analyze technological alternatives for developing IT solution with relevance to environment and sustainability.
IT426.2	Explore state-of-art tools and FOSS alternatives to develop solutions meeting societal and professional needs.
IT426.3	Develop a system through Software Development Life Cycle.
IT426.4	Demonstrate ability to engage in teamwork while observing professional ethics.
IT426.5	Communicate project work in writing and oral presentation.
IT426.6	Inculcate habit of self-study to become a lifelong learner.