Dr. J. J. Magdum Trust's
Dr. J. J. Magdum College of Engineering, Jaysingpur-416101.
Department of Information Technology
2021-22

Date - 22.08.2022

Program Outcomes (POs):

At the end of successul completion of program, the graduates will be able to understand,

1. **Engineering Knowledge**: Apply knowledge of mathematics, science, engineering Fundamentals and an engineering specialization to the solution of complex engineering problems.
2. **Problem Analysis**: Identify, formulate, research literature and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.
3. **Design/Development of Solutions**: Design solutions for complex engineering problems and design system components or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal and environmental considerations.
4. **Conduct investigations** of complex problems using research-based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of information to provide valid conclusions.
5. **Modern Tool Usage**: Create, select and apply appropriate techniques, resources and modern engineering and IT tools including prediction and modeling to complex engineering activities with an under-standing of the limitations.
6. **The Engineer and Society**: Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice.
7. **Environment and Sustainability**: Understand and the impact of professional engineering solutions in societal and environmental contexts and demonstrates knowledge of and need for sustainable development.
8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice.
9. **Individual and Teamwork**: Function effectively as in visual, and as a member or leader in diverse teams and in multidisciplinary settings.
10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations and give and receive clear instructions.
11. **Project Management and Finance**: Demonstrate knowledge and understanding of engineering and management principles and apply these too nods on work, as a member and leader instead, to manage projects and in multidisciplinary environments.
12. **Lifelong Learning**: Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological

Dr. J. J. Magdum College of Engg. Jaysingpur
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Program Specific Outcomes (PSO)

1. To design and implement solutions for network security, database security and software quality as per industry standards
2. To design and implement various services for operating systems, compiler libraries and programming applications
3. To enhance the management skills and organizational behavior in IT industry

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Jaysingpur - 416101

SHIVAJI UNIVERSITY, KOLHAPUR

COURSE OUTCOMES

Semester-III

Sr. No.	Code No.	Subject	Credits
1	PCC- IT 301	Statistics & Fuzzy Systems	4
2	PCC- IT 302	Digital System & Microprocessor	5
3	PCC- IT 303	Data Communication	3
4	PCC- IT 304	Fundamentals of Economics and Management	3
5	PCC- IT 305	Discrete Mathematical Structures	4
6	PCC- IT 306	Problem solving using C	5
7	PW-IT307	Soft Skills	1
		Total	25

Semester-IV

Sr. No.	Code No.	Subject	Credits
1	PCC- IT 401	Computer Network	4
2	PCC- IT 402	Computer Organization and Architecture	3
3	PCC- IT 403	Data Structures	3
4	PCC- IT 404	Theory of computation	4
5	PCC- IT 405	Software Engineering	3
6	PCC- IT 406	Object Oriented Programming	4
7	PW-IT 407	Mini Project	1
8	MC-IT 408	Environmental Studies	3
		Total	25

Course code & Course title	PCC- IT 301-Statistics & Fuzzy Systems

Course outcomes: After successful completion of the course, the students will be able to-

1. Describe the statistical data numerically by using Lines of regression and Curve fittings
2. Solve basic problems in probability theory, including problems involving the binomial, Poisson and
Normal distributions
3. Calculate numerical integration
4. Define fuzzy sets using linguistic words and represent these sets by membership functions, convexity, normality, support etc…
5. Solve examples on the principle in performing fuzzy number arithmetic operations such as addition,
multiplication and fuzzy equation
6. Solve assignment problems by using different techniques of operation research

Course code & Course title	PCC- IT 302- Digital System & Microprocessor

Course outcomes: After successful completion of the course, the students will be able to-

1. Solve different examples of arithmetic and logical operations on various number systems.
2. Design and demonstrate different sequential and combinational-logic design.
3. Summarize the working of 8085 & 8086 microprocessor and peripheral.
4. Design and execute assembly language programs using 8085 instruction set.
5. Distinguish different instructions using timing diagrams.

Course code & Course title	PCC- IT 303- Data Communication

Course outcomes: After successful completion of the course, the students will be able to-

1. Explain the basic concepts and components of Data communication system.
2. Understand Data Encoding techniques.
3. Compare various multiplexing & spreading techniques.
4. Understand responsibilities of each layer in OSI model.
5. Study and understand protocols used at each layer in TCP/IP reference model.
6. Get familiar with hardware components required to build network.

Course code & Course title	PCC- IT 304- Fundamentals of Economics and Management

Course outcomes: After successful completion of the course, the students will be able to-

1. Explain basic economics concepts
2. Describe different management related activities for business enhancement
3. Explain basic costing and marketing policie

Course code & Course title	PCC- IT 305- Discrete Mathematical Structures
Course outcomes: After successful completion of the course, the students will be able to- 1. Understand mathematical logic, truth tables and its applications. 2. Discuss the basic principles of sets and operations insets. 3. Demonstrate an understanding of relations and functions and be able to determine their properties 4. Determine basic terminologies of groups, graphs and its applications. 5. Implement the knowledge of logical reasoning to solve variety of problems 6. Acquire ability to describe computer programs in a formal mathematical manner and become efficient to face GATE and other competitive exams.	

Course code & Course title	PCC- IT 306- Problem solving using C
Course outcomes: After successful completion of the course, the students will be able to- 1.Illustrate flowchart and algorithm to the given problem 2. Understand basic Structure of the C-PROGRAMMING, declaration and usage of variables 3. Write C programs using operators 4. Exercise conditional and iterative statements to Write C programs 5. Write C programs using Pointers to access arrays, strings and functions.	

Course code & Course title	PW- IT 307- Soft skills
Course outcomes: After successful completion of the course, the students will be able to- 1. Enhance the communications skills of the students. 2. Expose the students to basic skills of teamwork 3. Inculcate the writing skills necessary for business communications.	

Semester-IV

Course code & Course title	PCC- IT 401- Computer Network
Course outcomes: After successful completion of the course, the students will be able to- 1. Explain functions of data link layer 2. Describe network layer of OSI model 3. Explain transport layer with its functionality 4. Explain application layer of OSI model.	

Course code & Course title	PCC- IT 402- Computer Organization and Architecture

Course outcomes: After successful completion of the course, the students will be able to-

1. To understand the structure, function and characteristics of components of computer.
2. To examine the design at gate, register and processor level.
3. To understand various processor architectures and data representation.
4. To apply algorithm to perform operation like multiplication and division.
5. To illustrate control unit.
6. To study memory organization

Course code & Course title	PCC- IT 403- Data Structures

Course outcomes: After successful completion of the course, the students will be able to-

1. Define the basic terms of Linear Lists, Linked List, Doubly Linked List, Non Linear Data Structures
(Binary Trees, AVL Trees, Graphs)
2. Choose the appropriate and optimal data structure for a specified Application
3. Analyze Time Complexity and Memory Complexity of different Algorithms
4. Write programs and applications with Static and Dynamic data structures

Course code & Course title	PCC- IT 404- Theory of computation

Course outcomes: After successful completion of the course, the students will be able to-

1. To expose the students to the mathematical foundations and principles of computer science.
2. To make the students understand the use of automata theory in Compliers & System programming.
3. To make the student aware of mathematical tools, formal methods & automata techniques to computing.
4. Face the successfully to the GATE as well as competitive exams.
5. Understand the fundamental mathematical, logical, statistical and scientific principles underlying computing and information processing.

Course code & Course title	PCC- IT 405- Software Engineering
Course outcomes: After successful completion of the course, the students will be able to- 1. Describe basic concepts of software engineering 2. Explain phases of software development life cycle in detail 3. Explain software reliability and quality management.	

Course code & Course title	PCC- IT 406- Object Oriented Programming
Course outcomes: After successful completion of the course, the students will be able to- 1. To understand the basic object oriented concepts. 2. To understand variables, pointer in CPP. 3. To implement types of inheritance 4. To understand file handling.	

Course code & Course title	PW- IT 407- Mini Project
Course outcomes: After successful completion of the course, the students will be able to- 1. Solve the real time Problems with Logical skills. 2. Simplify the problem structure with good team Management 3. Learn the skills of team building to achieve the final output. 4. Develop the logical skill with appropriate data structure.	

Course code & Course title	MC- IT 408- Environmental Studies
Course outcomes: After successful completion of the course, the students will be able to- 1.	

SHIVAJI UNIVERSITY, KOLHAPUR

COURSE OUTCOMES

Semester-V

Sr. No.	Code No.	Subject	Credits
1	PCC- IT 501	Operating System-I	4
2	PCC- IT 502	Database Engineering	4
3	PCC- IT 503	Computer Algorithms	3
4	PCC- IT 504	System Programming	5
5	OEC- IT 505	Human Computer Interaction	3
	OEC- IT 506	Internet of Things	5
6	PCC-IT 507	Application Development Tool I	1
7	HM-IT 508	Soft Skill	1

Semester-VI

Sr. No.	Code No.	Subject	Credits
1	PCC- IT 601	Computer Graphics	4
2	PCC- IT 602	Information Security	5
3	PCC- IT 603	Internet Technology	5
4	PCC- IT 604	Operating System II	4
5	OEC- IT 605	Cyber Security	3
	OEC- IT 606	E- Commerce & Digital Marketing	3
6	PCC-IT 607	Application Development Tool II	3
7	PW-IT 608	Seminar	1

Course code & Course title	PCC- IT 501- Operating System-I

Course outcomes: After successful completion of the course, the students will be able to-

1. Write and describe the general architecture of computers
2. Describe, contrast and compare differing structures for operating systems.
3. Construct the operating system for certain hardware modules.
4. Use operating system concepts efficiently at various stages of the software development process.
5. Understand and analyze theory and implementation of processes, resource control (concurrency etc.), physical and virtual memory, scheduling, I/O and files.
6. Design, implement and enhance various modules of the operating system to reduce time complexity and space complexity.
7. Compare and construct the various standard solutions to operating system problems

Course code & Course title	PCC- IT 502- Database Engineering

Course outcomes: After successful completion of the course, the students will be able to-

1. To understand the fundamental concepts of database management.
2. To give a systematic database design approach.
3. To understand the basics of transaction processing and concurrency control in database systems.

Course code & Course title	PCC- IT 503- Internet Technology

Course outcomes: After successful completion of the course, the students will be able to-

1. Explain different design methods of algorithms.
2. Explain solvability, insolvability of a problem and computational models of parallel algorithms.
3. Apply different design methods of algorithms.
4. Apply different search techniques for efficient graph traversal.
5. Analyze complexity of different algorithm designs.

Course code & Course title	PCC- IT 504- Operating System II

Course outcomes: After successful completion of the course, the students will be able to-

1. Identify various language processors.
2. Design & implement prototypes of language processors.
3. Apply language processors tool to create language processors.
4. Understand lexical, syntax and semantic analysis process.

5. Understand and define the role of lexical analyzer, use of regular expression and transition diagrams.
6. Gain experience in the area of designing and implementing software system like language processors (e.g. assembler, linker, loader etc.).
7. Identify the computing feasibility of problems.

Course code & Course title	**OEC- IT 505- Human Computer Interaction**

Course outcomes: After successful completion of the course, the students will be able to-

1. To explain importance of HCI study and principles of user interface.
2. To develop understanding of human factors in HCI design.
3. To design effective user-interfaces.
4. To develop understanding of models, paradigms and context of interactions
5. To understand HCI design processes.
6. To apply cognitive models for predicting human-computer-interactions.

Course code & Course title	**OEC- IT 506- Internet of Things**

Course outcomes: After successful completion of the course, the students will be able to-

1. To learn Internet of Things Technology
2. To know the basics of RFID, sensor and GPS technologies
3. To aware students about wireless technologies and IoT applications

Course code & Course title	**PW- IT 507- Application Development Tool I**

Course outcomes: After successful completion of the course, the students will be able to-

1. Understand the structure and model of the Java programming language.
2. Use the Java programming language for various programming technologies.
3. Develop software in the Java programming language.

Course code & Course title	**HM- IT 508- Soft Skill**

Course outcomes: After successful completion of the course, the students will be able to-
1. Effectively communicate through verbal/oral communication and improve the listening skills
2. Write precise briefs or reports and technical documents.
3. Actively participate in group discussion / meetings / interviews and prepare & deliver presentations.
4. Become a more effective individual through goal/target setting, self-motivation and practicing creative thinking.
5. Function effectively in multi-disciplinary and heterogeneous teams through the knowledge of team work, Inter-personal relationships, conflict management and leadership quality.

Course code & Course title	PCC- IT 601- Computer Graphics

Course outcomes: After successful completion of the course, the students will be able to-

1. To express basic ideas of computer graphics and different
2. To demonstrate 2D and 3D transformations.
3. To Implement and understand different types of clipping algorithms used to perform clipping operations on geometric objects.
4. To demonstrate different types of curves in computer graphics.
5. To make use of various multimedia editing tools and software.

Course code & Course title	PCC- IT 602- Information Security

Course outcomes: After successful completion of the course, the students will be able to-

1. Design, implement and enhance security modules for software
2. Architect the security system for certain hardware modules
3. Understand ethical issues of usage of intern security
4. Compare and contrast the various standard solutions to the security problems
5. Utilize security system concept efficiently at software development process

Course code & Course title	PCC- IT 603- Internet Technology

Course outcomes: After successful completion of the course, the students will be able to-

1. Program the client server model using sockets
2. Understand and apply next generation protocol and addressing model
3. Elaborate the fundamentals of Domain Name Systems
4. Apply the concepts of Remote login and FTP in network applications
5. Learn fundamentals of web, HTTP and e-mail communication protocols.
6. Understand multimedia streaming and relevant protocols.

Course code & Course title	PCC- IT 604- Operating System II

Course outcomes: After successful completion of the course, the students will be able to-

1. To understand fundamental concepts of the Unix System.
2. To understand the File system and system calls
3. To study structure of process
4. To study Process control and scheduling
5. To study Memory management and I/O subsystem

Course code & Course title	OEC- IT 605- Cyber Security

Course outcomes: After successful completion of the course, the students will be able to-

1. Explain the cyber security concepts.
2. Describe the cyber security vulnerabilities and prevention techniques.
3. Explain the different rules and regulations under I.T. ACT.
4. Explain the concepts of digital forensics & incident management

Course code & Course title	OEC- IT 606- E- Commerce & Digital Marketing

Course outcomes: After successful completion of the course, the students will be able to-

1. Students will be able to identify the importance of the e-commerce and digital marketing for business success
2. Students will be able to create a digital marketing plan, starting from the SWOT analysis and defining a target group
3. Students will be able to identifying digital channels, business tools used in social networking
4. Students will be able to demonstrate the optimization of web site using business tools.

Course code & Course title	PCC- IT 607- Application Development Tool II

Course outcomes: After successful completion of the course, the students will be able to-

1. Understand the structure and model of the programming language C #
2. Develop, implement Applications with C#.

Course code & Course title	PW- IT 608- Seminar

Course outcomes: After successful completion of the course, the students will be able to-

1. To identify recent technical topics from interested topic.
2. To organize a detailed literature survey of their seminar topic.
3. To illustrate the seminar topic through presentation.
4. To undertake problem identification, formation and solution.
5. To develope a technical report.

SHIVAJI UNIVERSITY, KOLHAPUR

COURSE OUTCOMES

Semester-VII

Sr. No.	Code No.	Subject	Credits
1	PCC- IT 701	Distributed Computing	5
2	PCC- IT 702	Mobile Computing	4
3	PCC- IT 703	Advanced Database Systems	4
4	PCE- IT 704	Image processing	4
		Soft Computing	
		Data Science	
5	PCC- IT 705	Web Technology	5
6	PW- IT 706	Project – I	2
7	WI-IT 707	Winter Internship	1

Semester-VIII

Sr. No.	Code No.	Subject	Credits
1	PCC- IT 801	Machine Learning	5
2	PCC- IT 802	Cloud Computing	5
3	PCE- IT 803 Elective -II	Enterprise Resource Planning	4
		Information Retrieval	
		Business Intelligence	
4	PCE- IT 804 Elective -III	Software Testing	4
		Artificial Intelligence	
		Project Management	
5	PCC- IT 805	Advance Web Technology	5
6	PW- IT 806	Project - II	2
7	WI-IT807	Winter Internship	0

Course code & Course title	PCC- IT 701- Distributed Computing

Course outcomes: After successful completion of the course, the students will be able to-

1. Upon Completion of the course, the students will be able to
2. List the principles of distributed systems and describe the problems and challenges associated with these principles.
3. Understand Distributed Computing techniques, Synchronous and Processes.
4. Apply Shared Data access and Files concepts.
5. Design a distributed system that fulfils requirements with regards to key distributed systems properties.
6. Understand Distributed File Systems and Distributed Shared Memory.
7. Apply Distributed web-based system.
8. Understand the importance of security in distributed systems

Course code & Course title	PCC- IT 702- Mobile Computing

Course outcomes: After successful completion of the course, the students will be able to-

1. Understand basics of wireless communications.
2. Analyze the applications that are mobile-device specific and express current practice in mobile
Computing contexts.
3. Understand and recognize the GSM, GPRS and Bluetooth software model for mobile computing.

Course code & Course title	PCC- IT 703- Advanced Database Systems

Course outcomes: After successful completion of the course, the students will be able to-

1. Implement a database management system in a complex domain, making the best use of the available tools and techniques.
2. Learn and experiment advanced database techniques, models and products, and to provide them with the knowledge to take decisions concerning implementation issues.

Course code & Course title	PCE- IT 704- Image processing

Course outcomes: After successful completion of the course, the students will be able to-

1. Know and understand the basics and fundamentals of digital image processing such as digitization, sampling, quantization and 2D-transforms.
2. Operate on images using different image transforms and filtering techniques.
3. Understand the image enhancement techniques.
4. Learn the basics of color image processing.
5. Demonstrate an application based on image processing.

Course code & Course title	PCE- IT 704- Soft Computing

Course outcomes: After successful completion of the course, the students will be able to-

1. Understand basic concept of Soft Computing.
2. Know different Soft Computing Techniques.
3. Understand Concept related Neural Networks and Fuzzy Systems.

Course code & Course title	PCE- IT 704- Data Science

Course outcomes: After successful completion of the course, the students will be able to-

1. Apply various Python data structures to effectively manage various types of data.
2. Explore various steps of data science pipeline with role of Python.
3. Design applications applying various operations for data cleansing and transformation.
4. Use various data visualization tools for effective interpretations and insights of data.
5. Perform data Wrangling with Scikit-learn applying exploratory data analysis.
6. Apply various Python data structures to effectively manage various types of data.

Course code & Course title	PCC- IT 705- Web Technology

Course outcomes: After successful completion of the course, the students will be able to-

1. Apply knowledge of different HTML/CSS elements for designing web pages
2. Construct client side scripts for validating HTML form data using Javascript technology
3. Develop web applications using HTML/CSS/JavaScript/Server side technologies

Course code & Course title	PW- IT 706- Project – I

Course outcomes: After successful completion of the course, the students will be able to-

1. Explain the need of a software project for the society.
2. Identify requirement analysis like functional and technical requirements for the Project.
3. Come up with design documents for the project consisting of Architecture, Dataflow diagram, class diagram, Algorithmic descriptions of various modules, collaboration diagram, ER Diagrams, Database Design Documents, Sequence Diagram, Use Case diagram.
4. Able to demonstrate analysis and design of project
5. Prepare the technical report consisting of Requirement specification, Analysis and design of Project

Course code & Course title	WI- IT 707- Winter Internship

Course outcomes: After successful completion of the course, the students will be able to-

1. Students build applicable skills through a variety of internship opportunities, and our graduates find positions in public and private organizations
2. Assess and improve upon their, own cultural competency skills.

Semester-VIII

Course code & Course title	PCC- IT 801- Machine Learning

Course outcomes: After successful completion of the course, the students will be able to-

1. Explain Machine Learning concepts
2. Distinguish various machine learning algorithms
3. Apply appropriate learning methods for problems
4. Design solution using Machine Learning techniques.

Course code & Course title	PCC- IT 802- Cloud Computing

Course outcomes: After successful completion of the course, the students will be able to-

1. Understanding and familiar with the basic concepts of cloud computing
2. Demonstration of different virtualization techniques
3. Illustrates different cloud applications
4. Understand resent trends in cloud computing
5. Comprehend the importance of cloud security

Course code & Course title	PCE- IT 803- Enterprise Resource Planning

Course outcomes: After successful completion of the course, the students will be able to-

1. To impart knowledge about different facets of ERP Systems
2. To impart knowledge of ERP implementation process and get familiar with the common pitfalls.
3. Explain the challenges associated with implementing enterprise systems and their impacts on organizations •
4. Describe the selection, acquisition and implementation of enterprise systems
5. Use one of the popular ERP packages to support business operations and decision-making,
6. Communicate and assess an organization's readiness for enterprise system implementation with a professional approach in written form

Course code & Course title	PCE- IT 803- Information Retrieval
Course outcomes: After successful completion of the course, the students will be able to- 1. To apply Information Retrieval system to search information. 2. To design and develop Retrieval systems.	

Course code & Course title	PCE- IT 803- Business Intelligence
Course outcomes: After successful completion of the course, the students will be able to- 1. Describe the concepts and components of Business Intelligence (BI). 2. Evaluate use of BI for supporting decision making in an organization. 3. Understand and use the technologies and tools that make up Business Intelligent. 5. Design and development of Business Intelligent Applications. 4. Plan the implementation of a BI system.	

Course code & Course title	PCE- IT 804- Software Testing
Course outcomes: After successful completion of the course, the students will be able to- 1. Design the test cases and apply for software testing. 2. Identify different levels of Testing to be carried out. 3. Develop and validate a test plan. 4. Prepare test planning based on the document. 5. Use automatic testing tools in Software testing.	

Course code & Course title	PCE- IT 804- Artificial Intelligence
Course outcomes: After successful completion of the course, the students will be able to- 1.	

Course code & Course title	PCE- IT 804- Project Management
Course outcomes: After successful completion of the course, the students will be able to- 1.	

Course code & Course title	PCC- IT 805- Advance Web Technology
Course outcomes: After successful completion of the course, the students will be able to- 1. Explain the concepts of advanced web development. 2. Design Front end using Angular technology	

3. Develop a web application using back end technologies.

Course code & Course title	PW- IT 806- Project - II
Course outcomes: After successful completion of the course, the students will be able to- 1. Design and develop usable User Interface 2. Analyze and apply emerging technologies in development of a project 3. Test the modules in Project 4. Demonstrate working of project	

Course code & Course title	WI- IT 807- Winter Internship
Course outcomes: After successful completion of the course, the students will be able to- 1. Demonstrate understanding of therapeutic models of helping. 2. Understand the stages of helping, including exploration, insight, and action 3. Develop applied helping skills to facilitate change in individuals, families, and group	