

Phaltan Education Society's
College of Engineering, Phaltan
Computer Engineering Department

VISION:-

The Computer Engineering Department aims to be the leader in information and communications Technology (ICT) education and research through adherence to standards of academic excellence.

MISSION:-

The mission of the Computer Engineering Department is to facilitate the development of well rounded, educated, productive and ethical individuals who are well versed in technology and in social, political and environmental issues.

Programme Outcomes

PO1 The graduates will possess the knowledge of various discrete mathematical structures, Logic and numerical techniques.

PO2 The graduates will have an ability to apply mathematical formalism of Finite Automata and Probability in modeling and analysis of systems.

PO3 The graduates will have knowledge of core programming paradigms such as database orientation, object orientation, and agent orientation and concepts essential to implement software based system.

PO4 The graduates will have an ability to analyze problem, specify algorithmic solutions to them and to evaluate alternative solutions.

PO5 The graduate will have broad understanding of the impact of a computer based solutions in economic, environmental and social context and will demonstrate use of analytical tools in gathering requirements and distilling relevant information to provide computer based solutions.

PO6 The graduates will demonstrate the ability to build human centric interfaces to computers.

PO7 The graduates will possess the knowledge of advanced and emerging topics in the fields of operating systems, databases and computer networks.

PO8 The graduates will possess skills necessary to communicate design engineering ideas. The skills set include verbal, written and listening skills.

PO9 The graduates will understand ethical issues in providing computer based solutions also they will have an ability and attitude to address the ethical issues.

PO10 The graduates will understand the role of system software such as operating systems, database management systems, compilers, middle-ware and internet protocols in realizing distributed information environment

Programme Educational Objectives

PEO1 To provide knowledge of sound mathematical principles underlying various programming concepts.

PEO2 To develop an ability to understand complex issues in the analysis, design, implementation and operation of information systems.

PEO3 To provide knowledge of mechanisms for building large-scale computer-based systems.

PEO4 To develop an ability to provide computer-based solutions to the problems from other disciplines of science and engineering.

PEO5 To impart skills necessary for adapting rapid changes taking place in the field of information and communication technologies.

PEO6 To provide knowledge of ethical issues arising due to deployment of information and communication technologies in the society on large scale.

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Course Outcomes

Semester : III

Sr. No.	Subject	Course Outcomes	
1	Applied Mathematics	CO1	Apply basic mathematical tools for solving engineering problems.
		CO2	Develop logical and critical thinking and the ability to reflect critically upon their work
		CO3	Deploy skills effectively in the solution of problems, principally in the area of engineering
		CO4	Apply Statistical techniques to practical Engineering Problems
		CO5	Probability techniques to practical Engineering Problems
		CO6	Assignment problem techniques to practical Engineering Problems.
2	Discrete Mathematical Structures	CO1	Students analyze basics knowledge gained by mathematical logic, functions and relation and apply them
		CO2	Students are able to apply concepts of coding theory and model different situations
		CO3	Use graph theory and trees to formulate the problems and solve them
		CO4	Use set, relation and function to formulate a problem and solve it
		CO5	At the end of the course, students would have knowledge of the concepts needed to test the logic of a program
		CO6	
		CO1	Student should able to know fundamentals of data structures like array, list, linked list, stack, queue, tree, graph, hashing.
		CO2	Student should able to identify suitable data structure for application.

3	Data Structures	CO3	Student should able to use data structure to solve problems.
		CO4	Student should able to implement various data structures and algorithm essential for implementing computer based solutions.
		CO5	
		CO6	
4	Data Communications	CO1	Identify the different types of network topologies and protocols.
		CO2	Able to differentiate between OSI and TCP/IP models and identify the responsibility of each layer.
		CO3	Identify the different types of network topologies and protocols.
		CO4	understand the basic principles of network design;
		CO5	understand the concept data communication within the network environment;
		CO6	Identify the different types of network devices and their functions within a network
5	Microprocessors	CO1	The students will get exposed to architecture of different microprocessors.
		CO2	Students wil understand instruction sets and addressing modes of different microprocessor
		CO3	Studentys will get hands on experience on assembly language programming for microprocessor.
		CO4	Students will understand concept of multi core processors.
		CO5	Students will understand basic interrupt processing of microprocessor.
		CO6	Students will understand techniques for faster execution of instructions and improve speed of operation and performance of microprocessors.
6	Programming Lab - I	CO1	Implement various linear data structures like stacks, queues, linked lists using static and dynamic allocation and their applications
		CO2	Select appropriate searching and/or sorting techniques in the application development
		CO3	Develop , execute and document computerized solution for various problems using the features of C language
		CO4	Program with pointers and arrays, perform pointer arithmetic, and use the preprocessor

		CO5	Understand how to write and use functions, how the stack is used to implement function calls, and parameter passing options
		CO6	Understand and use the common data structures typically found in C programs — namely arrays, strings, lists, trees, and hash tables
7	Soft skills	CO1	Provides an ability to understand, analyze and interpret the essentiality of grammar and its proper usage
		CO2	2. Build the students' vocabulary by means of communication via web, direct Communication and indirect communication
		CO3	Improves Students' Pronunciation skills and understanding between various phonetic sounds during communication
		CO4	Understanding the various rules and means of written communication
		CO5	Effective communication with active listening, facing problems while communication and how to overcome it.
		CO6	Students will learn the concept of enable them to communicate confidently and competently in English Language in all spheres

Semester : IV

Sr. No.	Subject	Course Outcomes	
1	Automata Theory	CO1	Have a clear understanding of the Automata theory concepts such as REs, DFAs, NFAs, Stacks, Turing machines, and Grammars
		CO2	An ability to prove and disprove theorems establishing key properties of formal languages and automata.
		CO3	Acquire a fundamental understanding of the core concepts in automata theory and formal languages.
		CO4	analyse and design finite automata, pushdown automata, Turing machines, formal languages, and grammars
		CO5	Model, compare and analyse different computational models using combinatorial methods.

		CO6	prove the basic results of the Theory of Computation.
2	Computer Networks	CO1	To develop an understanding of modern network architectures from a design and performance perspective.
		CO2	Analyze the requirements for a given organizational structure and select the most appropriate networking architecture and technologies.
		CO3	To study protocols, network standards, the OSI model, IP addressing, cabling, networking components, and basic LAN design.
		CO4	Ability to write program using socket programming.
		CO5	
		CO6	
3	Computer Organization	CO1	Master the binary and hexadecimal number systems including computer arithmetic,
		CO2	Be familiar with the history and development of modern computers
		CO3	Be familiar with the functional units of the processor such as the register file and arithmetic-logical unit,
		CO4	Be familiar with the basics of systems topics: single cycle (MIPS), multi-cycle (MIPS), parallel, pipelined, superscalar, and RISC/CISC architectures.
		CO5	Be familiar with the cost-performance issues and design trade-offs in designing and constructing a computer processor including memory.
		CO6	Be familiar with the cache subsystem
4	Operating System-I	CO1	To learn the fundamentals of Operating Systems.
		CO2	To learn the mechanisms of OS to handle processes and threads and their communication.
		CO3	To learn the mechanisms involved in memory management in contemporary OS.
		CO4	To gain knowledge on distributed operating system concepts that includes architecture, Mutual exclusion algorithms, deadlock detection algorithms.
		CO5	To know the components and management aspects of concurrency management.
		CO6	To learn programmatically to implement simple OS mechanisms.

5	Software Engineering	CO1	Aware of basic computer engineering concept through SDLC life cycle and Models in software engineering
		CO2	The ability to analyze, design, verify, validate, implement, apply, and maintain software systems
		CO3	Work as an individual and as part of a multidisciplinary team to develop and deliver quality software
		CO4	Should be able to apply the project management and analysis principles to S/W project development
		CO5	Demonstrate an ability to use the techniques and tools necessary for engineering practice
		CO6	Understand and apply the concept of software engineering
6	Programming Lab - II	CO1	Ability to develop applications using Object Oriented Programming Concepts.
		CO2	Interpret and design the Exception Handling Techniques for resolving run-time errors and handle large data set using file I/O
		CO3	Apply and implement major object oriented concepts like message passing, function overloading, operator overloading and inheritance to solve real-world problems.
		CO4	Use major C++ features such as Templates
		CO5	To understand the role of inheritance, polymorphism, dynamic binding and generic structures in building reusable code.
		CO6	Be familiar with C++ classes.
7	Mini Project	CO1	To undertake & execute a Mini Project through a group of students
		CO2	To understand the 'Product Development Cycle' through Mini Project.
		CO3	To develop student's abilities to transmit technical information clearly and test the same by delivery of Seminar based on the Mini Project.
		CO4	To understand the importance of document design by compiling Technical Report on the Mini Project work carried out.
		CO5	
		CO6	

Semester : V

Sr. No.	Subject		Course Outcomes
1	Computer Graphics	CO1	Understand the structure of modern computer graphics systems.
		CO2	Understand the basic principles of implementing computer graphics primitives.
		CO3	Develop design and problem solving skills with application to computer graphics.
		CO4	Gain experience in constructing interactive computer graphics programs using OpenGL.
		CO5	Be able to discuss the application of computer graphics concepts in the development of computer games, information visualization, and business applications.
		CO6	Be able to discuss future trends in computer graphics and quickly learn future computer graphics concepts.
2	System Programming	CO1	Understand the basics of Language Processor.
		CO2	Understand the basics and deep concept of Assemblers
		CO3	Understand the working of Macros and Macro Processors
		CO4	working with compiler and Interpreters and able to discuss various issue.
		CO5	Students will get the knowledge of Linking mechanism
		CO6	Have better understanding of Software tools
3	Object Oriented Modeling and Design	CO1	Design Models using UML
		CO2	Understand UML in detail, its diagrams as modelling tool for large and complex software systems.
		CO3	Have better understanding of requirements cleaner designs and more maintainable systems
		CO4	Draw a Object Oriented model and implement it using UML tool.
		CO5	Master the concepts of Object Oriented modelling, designing and should have attained practical skills in applying these concepts
		CO6	implementation of patterns
		CO1	Students will get the knowledge of basic algorithm, Complexity Analysis
		CO2	Students will get the knowledge of Graph traversal algorithm

4	Computer Algorithms	CO3	Analyze worst-case running times of algorithms using asymptotic analysis
		CO4	Describe the dynamic-programming paradigm and explain when an algorithmic design situation calls for it.
		CO5	Describe the greedy paradigm and explain when an algorithmic design situation calls for it
		CO6	Explain the major graph algorithms and their analyses
5	Network Technologies	CO1	Determine the downlink and uplink frequencies for AMPS channel
		CO2	Explain the function of Mobile station roaming number
		CO3	Describe OFDM Modulation System
		CO4	Describe the basic operation of GSM GPRS
		CO5	Describe different wireless networks like Wireless LAN, Wireless PAN
		CO6	Understand different protocols of Wireless network like Security ,Routing
6	Programming Lab - III	CO1	Discuss various fundamental concept in java progarmming
		CO2	implement and get hands on practis with Interface, Inheritance and Packaging
		CO3	Understading ath various exception and techniques to handel exception also implement the various I/O
		CO4	get familer with GUI and it component and there implementation
		CO5	understadning the networking and its implementation with Sockets and URL also try to understand and implent the concept of multithreading
		CO6	discuss and implementing concept of Collection and Database Programming
7	Business English	CO1	Proper understanding of professional culture
		CO2	it will improve the students Vocabulary Building and Reading Comprehension:
		CO3	Discuss various Effective Vocal Communication things
		CO4	Describe different Effective Written communication
		CO5	put Public Speaking and Presentation Skills in to student for betterment of there feature
		CO6	making student understandable to handle theMiscellaneous issues

Semester : VI

Sr. No.	Subject	Course Outcomes
1	Compiler Construction	CO1 Ability to create lexical rules and grammars for a programming language
		CO2 Master building symbol tables and generating intermediate code
		CO3 Be familiar with compiler architecture.
		CO4 Be familiar with register allocation
		CO5 Be exposed to compiler optimization.
		CO6 To introduce the major concept areas of language translation and compiler design
2	Operating System - II	CO1 Fundamental architecture of UNIX operating system kernel.
		CO2 Detail algorithms of buffer cache management.
		CO3 Basic idea of Internal File system organizations and related algorithms in UNIX and system calls.
		CO4 Process structure, creation and management in UNIX.
		CO5 To understand architecture and algorithms of process scheduling and memory management.
		CO6 To understand I/O subsystem architecture and algorithms.
3	Database Engineering	CO1 Differentiate database systems from file systems by enumerating the features provided by database systems and describe each in both function and benefit.
		CO2 Define the terminology, features, classifications, and characteristics embodied in database systems.
		CO3 Demonstrate an understanding of the relational data model.
		CO4 Transform an information model into a relational database schema and to use a data definition language and/or utilities to implement the schema using a DBMS.
		CO5 Formulate, using SQL, solutions to a broad range of query and data update problems.

		CO6	Demonstrate an understanding of normalization theory and apply such knowledge to the normalization of a database
4	Storage Networks	CO1	To enable the students to understand how data centre's maintain the data with the
		CO2	To understand the RAID concepts
		CO3	Discuss different types of logical and physical components of a storage infrastructure.
		CO4	Understand the importance of Fibre Channel protocols and how to communicate with each other.
		CO5	Identify single points of failure in a storage infrastructure and list solutions.
		CO6	Describe the different role in providing disaster recovery and business continuity capabilities.
5	Information Security	CO1	will be able to understand the various classical encryption techniques
		CO2	implementation and working of DES and related Algorithms for Encryption and Decryption
		CO3	Discuss different types of Key management Techniques and Authentication
		CO4	Ability to create Digital Signature used with various Authentication mechanism
		CO5	understand the various techniques used in Email security and IP security
		CO6	understand the various techniques used in WEB and System Security
6	Programming Lab - IV	CO1	To make the student familiar with basic .Net framework.
		CO2	To make student understand the OO features and their implementations.
		CO3	To Understand Objects and Types, inheritance and arrays in .NET.
		CO4	Basic idea operators and Casts in .NET
		CO5	To understand Windows Form & Database with ADO.NET
		CO6	To understand Threading and networking in .NET.
		CO1	To understand the 'Product Development Cycle' through Domain Specific Mini Project

7	Domain Specific Mini-Project	CO2	To plan for various activities of the project and distribute the work amongst team members.
		CO3	To use and Explore open source Technologies for implementation of DSMP
		CO4	To understand the importance of document design IN DSMP
		CO5	
		CO6	

Semester : VII

Sr. No.	Subject		Course Outcomes
1	Advanced Computer Architecture	CO1	Know the classes of computers, and new trends and developments in computer architecture
		CO2	Understand the organization and operation of current generation parallel computer systems, including multiprocessor and multicore systems.
		CO3	Improve application performance for different cpu architectures.
		CO4	Understand the various techniques to enhance processors ability like Pipelining and its different, and its challenges.
		CO5	Understand parallel memory organizations like Associative Memory Organization
		CO6	Understand multithreading by using ILP and supporting thread-level parallelism (TLP).
2	Distributed Systems	CO1	Understand the principles and desired properties of distributed systems on which the internet and other distributed systems are based.
		CO2	Understand and apply the basic theoretical concepts and algorithms of distributed systems in problem solving.
		CO3	Recognize the inherent difficulties that arise due to distributed-ness of computing resources
		CO4	Identify the challenges in developing distributed applications.
		CO5	To understand basic principles of Cloud Computing
		CO6	To understand various DS concepts like RPC, RMI
		CO1	Understand concepts around Business Intelligence and Business Analytics.

3	Advanced Database Systems	CO2	The basics of Analytics – Concepts, Data preparation – merging, managing missing numbers sampling, Data visualization, Basic statistics.
		CO3	To handle large concurrent operations.
		CO4	To understand the different database models (RDBMS, OODBMS, ORDBMS) and language queries to access databases.
		CO5	To protect the data and the database from unauthorized access and manipulation.
		CO6	To handle large concurrent operations.
4	Soft Computing	CO1	Understanding the basics of neural network
		CO2	Understanding the Concept of Artificial Neural Network
		CO3	Understanding the various ways to build the ANN and train them
		CO4	Use and implementation of Fuzzy System
		CO5	Understanding the basics of Genetic Algorithm ,its implementation and Application
		CO6	Understanding the applications of Soft computing.
5	Web Technologies – I	CO1	Students will be able to implement HTML structure, All type of HTML Tags, CSS .
		CO2	Students will be able to understand structure of XML
		CO3	Students will be able to implement the XML
		CO4	Students will be able to implement basic servlets
		CO5	Students will be able to implement advanced techniques of servlets
		CO6	Students will be able to web using Java Server Pages.
6	Project – I	CO1	Students can practice to acquire knowledge within the chosen area of technology for project development.
		CO2	Students can write problem solutions in project using mathematical modelling.
		CO3	Students can write SRS and other software engineering related documents in project report using mathematical models developed and NP- Hard analysis
		CO4	Students can write test cases using multi-core, distributed, embedded, concurrent/Parallel environments;
		CO5	Students can write conference Paper.
		CO6	Students can practice Presentation, communication and team-work skills.

Semester : VIII

Sr. No.	Subject		Course Outcomes
1	Data Analytics	CO1	Understand big data challenges in different domains including social media, transportation, finance and medicine.
		CO2	Use data analytics methods to make predictions for a dataset. Predict outcomes with supervised machine learning techniques.
		CO3	Understand concepts around Business Intelligence and Business Analytics.
		CO4	Apply basic machine learning algorithms Linear Regression, k-Nearest Neighbors (k-NN), k-means, Naive Bayes for predictive modeling to solve various real-life examples.
		CO5	The basics of Analytics – Concepts, Data preparation – merging, managing missing numbers sampling, Data visualization, Basic statistics.
		CO6	To design and develop Hadoop and Map Reduce Framework.
2	Project Management	CO1	Concepts to address specific management needs at the individual, team, division and/or organizational level.
		CO2	Practical applications of project management to formulate strategies allowing organizations to achieve strategic goals.
		CO3	A perspective of leadership effectiveness in organizations.
		CO4	Team-building skills required to support successful performance.
		CO5	Critical-thinking and analytical decision-making capabilities to investigate complex business problems to propose project-based solutions.
		CO6	Skills to manage creative teams and project processes effectively and efficiently.
		CO1	Student will understand the basics and issues in Real time System
		CO2	Student will understand come to know the hardware requirements of design of Realtime System
		CO3	Student will understand come to know the aobut the issues in operating System present in real time System.

3	RTOS	CO4	Student will understand come to know about the various phases of Software engineering while implementing Real Time System , progarmming languages and software production process.
		CO5	Student will understand come to know about the various cost estimation processes
		CO6	Student will understand come to know varius existing RTOS Architecture
4	Internet of Things	CO1	Able to understand the application areas of IOT
		CO2	Exploring the features of predictive data analytics for IoT applications.
		CO3	Application of IoT in Industrial and Commercial Building Automation and Real World Design Constraints.
		CO4	Able to realize the revolution of Internet in Mobile Devices, Cloud & Sensor Networks
		CO5	Able to understand building blocks of Internet of Things and characteristics
		CO6	Demonstrate knowledge and understanding of the ethical issues of the Internet of Things
5	Web Technologies – II	CO1	Students will able to understand emerging Web technologies concepts and tools.
		CO2	Students will able to understand client side and server side scripting languages and validation techniques.
		CO3	Students will able implement database access technologies and state management techniques
		CO4	Students will able to implement real life Web applications using ASP.NET and PHP
		CO5	Students will able to implement PHP coding
		CO6	Students will able to implement Data Binding and State Management
6	Project – II	CO1	Students can write review SRS, reliability,testing reports,and other software engineering documents in the project.
		CO2	Students can write a problem solution using multi-core,distributed,embedded,concurrent/Parallel environments.
		CO3	Students can write test cases to demonstates the result of the project.
		CO4	Students can write conference paper.

		CO5	Students can write code using FOSS tools and technological propitiatory Tools as per requirements.
		CO6	Students can practice Presentations ,communication and team-work skills.
7	Community Services	CO1	Students will understand the public related services and identify the required services for the common man.
		CO2	Students will understand to prepare a presentation simulating the services that are being exposed to common man and give a demonstration during their visit to the concerned area.
		CO3	Students will understand to take the feedback from the concerned locality on a pre-designed format that may be provided by the Head of the Institute
		CO4	Students will make visit any Public Sector / Government/ Semi government organization like – Zilha Parishad, Collector Office, Municipal Corporation, Tahasildar Office, RTO, MSEB, Court, Railway station , Tourism Services, agricultural service sector, Bank