



K.D.K. College of Engineering, Nagpur

CO'S for

Bachelor of Computer Application-IInd Year

Software Engineering

Course Objectives	
1	Knowledge of basic SW engineering methods and practices, and their appropriate application.
2	Describe software engineering layered technology and Process frame work.
3	A general understanding of software process models such as the waterfall and evolutionary models.

Course Outcomes	
After completion of syllabus, the student is able to	
1	Understand to apply knowledge of mathematics, science, and engineering
2	Determine to design and conduct experiments, as well as to analyse and interpret data
3	Understand to function on multi-disciplinary teams
4	Understand Software Engineering Principles
5	Understand project management, and to know software risks and principles of quality management, further the concept of re-engineering and reverse engineering.

Object oriented programming (C++)

Course Objectives	
1	Write object-oriented programs using a programming language (e.g., Java, C++, Python).
2	Understand and use abstract classes, interfaces, and exception handling. Learn about object-oriented design principles and patterns.
3	Analyze complex problems and design object-oriented solutions. Evaluate and improve the design and implementation of object-oriented systems. Develop critical thinking and problem-solving skills using OOPS concepts.

Course Outcomes	
After completion of syllabus, the student is able to	
1	To identify classes, objects, members of a class and relationships among them for a specific problem
2	. To do numeric(algebraic) and string –based computation
3	To understand and implement modularity as well as basic error handling techniques
4	To understand and demonstrate the concepts of garbage collection, polymorphism, inheritance etc
5	Illustrate application of pointers in virtual functions.

Data Security & Privacy

Course Objectives	
1	Learn about the basics of data privacy and security, including data classification, encryption, and access control
2	Understand the role of data privacy and security in an organization's overall information security program
3	Understand the positive and negative impact of technology on privacy, and the ethics of data privacy
4	Learn about the fundamental concepts of data security and privacy mechanisms, including encryption standards and hash functions

Course Outcomes	
After completion of syllabus, the student is able to	
1	To learn the basic concepts related to data security and understand the different types of symmetric key ciphers.
2	To understand and apply the concepts of encryption standards.
3	To understand hash functions and to learn the basic concepts of hiding data in text and images
4	To understand the concepts of privacy, authentication, web and email security.
5	Identify privacy concerns arising from data mining and propose ethical data handling practices.

Introduction to Data Science

Course Objectives	
1	Introduce students to data science fundamentals
2	Develop students' ability to apply data analysis methods to solve real-world problems
3	Enhance students' skills in using data science tools and software
4	To expose the students to frontier areas of Cloud Computing and information systems, while providing sufficient foundations to enable further study and research

Course Outcomes	
After completion of syllabus, the student is able to	
1	Apply data science concepts and methods to solve problems in real-world contexts
2	Demonstrate proficiency with statistical analysis of data
3	Communicate data science concepts and reasoning in written reports and oral presentations
4	Develop the ability to build and assess data-based models
5	To analyze and apply network using data science

Basics of Electronics Engineering (Professional Elective – 1)

Course Objectives	
1	To understand different components and devices of digital electronics.
2	To gain fundamental knowledge of electronic components and shall be able to draw logic circuits.
3	To Design & develop combinational circuits.
4	To Design & develop sequential circuits.
Course Outcomes	
After completion of syllabus, the student is able to	
1	Solve number system problems & analyze the concept of digital logic gates.
2	Analyze, Design & implement combinational circuits.
3	Analyze, Design & implement sequential circuits.
4	Understand the basic principles of communication systems.
5	Demonstrate the concepts of wireless network and 4G Technology

Computer Architecture & Organization (Professional Elective – 1)

Course Objectives	
1	To understand basic functional structure of computers and data representation on it
2	To gain fundamental knowledge of basic processing units and shall be able to draw instruction formats.
3	To solve arithmetic algorithms and problems.
4	To understand the concept of memory & I/O operations and devices.
5	To acquire basic knowledge about I/O Organization & Pipelining.

Course Outcomes	
After completion of syllabus, the student is able to	
1	Recognize basic functional blocks of computer and addressing modes.
2	Differentiate data in different instruction formats & design the concept of bus organization & Control Unit.
3	Solve arithmetic problems, Booths Algorithms and IEEE standard numerical.
4	Categorize data in different mapping functions & solve memory related problems.
5	Define how data from main memory is mapped to cache.

Design Analysis and Algorithm (Professional Elective – 1)

Course Objectives	
1	Ability to analyze the performance of algorithms in terms of their time and space complexities.
2	Reinforce basic design concepts (e.g., pseudocode, specifications, top-down design)
3	To understand the different algorithm designing technique for solving problems.
4	Assess how the choice of data structures and algorithm design methods impacts the performance of programs
5	Solve problems using algorithm design strategies like the greedy method, divide and conquer, dynamic programming, backtracking, and branch and bound etc.
Course Outcomes	
After completion of syllabus, the student is able to	
1	At the end of the course students will be able to develop their own versions for a given computational task and to compare and contrast their performance with respect to time and space
2	The ability to choose the best possible model from a set of different algorithms and data structures so as to minimize the overall cost incurred.
3	Understand the fundamentals of algorithm design, including problem specification and analysis of time and space complexity.
4	Apply the Greedy approach to solve optimization problems such as Dijkstra's Algorithm, Knapsack Problem, and Minimum Cost Spanning Trees.
5	Recall and Classify the NP -hard and NP-complete problems

Yoga

Course Objectives	
1	Students will have an understanding about origin, history and development of Yoga..
2	They will have an idea about the insights of Indian philosophy and Astika & Nastika darshanas.
3	Introduction about Yoga according to various yogic texts.
Course Outcomes	
After completion of syllabus, the student is able to	
1	Increased flexibility, improved strength and balance, enhanced body awareness.
2	Development of mindfulness, reduced stress, improved concentration, and emotional resilience.
3	Understanding of yoga philosophy and its relevance to modern life, and potentially, the pursuit of self-realization and spiritual enlightenment.
4	Understand the origin and development of Yoga through Yogopanishads

Stress Management

Course Objectives	
1	To understand the nature and consequences of stress
2	To understand the impact of stress on work
3	To recognize the stressors, Adaptive and Maladaptive behavior.
Course Outcomes	
After completion of syllabus, the student is able to	
1	Understand the cognitive variables of stress
2	Learn Managing Work-Life Balance
3	Understand role of communication and emotional intelligence, conflict management
4	Preparing for better future by reducing the stress using the various techniques

Critical Thinking

Course Objectives	
1	Understand and apply fundamental principles of logical reasoning and argumentation.
2	Identify, analyze, and evaluate arguments and evidence in engineering contexts.
3	Develop problem-solving strategies using critical thinking methodologies.
4	Apply critical thinking skills to real-world engineering problems and case studies.
Course Outcomes	
After completion of syllabus, the student is able to	
1	Demonstrate the ability to construct and deconstruct arguments effectively.
2	Apply logical reasoning to identify and solve engineering problems.
3	Evaluate the credibility of sources and the validity of information in engineering scenarios.
4	Make informed decisions by integrating critical thinking with technical knowledge.

COMPUTER NETWORKS

Course Objectives	
1	To introduce the fundamental types of computer networks.
2	To demonstrate the TCP/IP & OSI model merits & demerits.
3	To know the role of various protocols in Networking
4	To make students aware of holistic life styles of Yogic-science and wisdom capsules in Sanskrit literature that are important in modern society with rapid technological advancements and societal disruptions.

Course Outcomes	
After completion of syllabus, the student is able to	
1	Students should be understand and explore the basics of Computer Networks and Various Protocols.
2	Student will be in a position to understand the World Wide Web concepts.
3	Students will be in a position to administrate a network and flow of information further.
4	Student can understand easily the concepts of network security, Mobile.
5	Student can understand the concept of Application Layer.

JAVA PROGRAMMING

Course Objectives	
1	To introduce the object-oriented programming concept
2	To understand object-oriented programming concepts, and apply them in solving problems.
3	To introduce the principles of inheritance and polymorphism; and demonstrate how they relate to the design of abstract classes
4	To introduce the concepts of exception handling and multithreading.
5	To introduce the design of Graphical User Interface using applets and swing controls.

Course Outcomes	
After completion of syllabus, the student is able to	
1	Use the syntax and semantics of java programming language and basic concepts of OOP.
2	Develop reusable programs using the concepts of inheritance, polymorphism, interfaces and packages.
3	Apply the concepts of Multithreading and Exception handling to develop efficient and error free codes.
4	Design event driven GUI and web related applications which mimic the real word scenarios.
5	Describe the need for exception handling in programming.

PHP

Course Objectives	
1	To introduce the importance of PHP in web page design
2	To understand the features like functions, forms in PHP.
3	To understand Files, OOPs concepts , Cookies, Sessions and Data base
4	To handle requests and draw images on the server with AJAX.

Course Outcomes	
After completion of syllabus, the student is able to	
1	Utilizing the basic concept of statements and arrays
2	Implement functions and browser handling power of PHP
3	Imparting Database applications, File handling, Cookies in the webpage.
4	Design and Implement Interactive Web Site using Forms, OOPS and AJAX.
5	Understand the fundamentals of AJAX and its role in asynchronous web communication.

DATA WAREHOUSING & DATA MINING

Course Objectives	
1	To Understand Data mining principles ,techniques and Introduce DM as a cutting edge business intelligence
2	To expose the students to the concepts of Data warehousing Architecture ,OLAP and Implementation
3	To learn to use association rule mining for handling large data
4	To identify Business applications and Trends of Data mining

Course Outcomes	
After completion of syllabus, the student is able to	
1	Store voluminous data for online processing
2	Apply the association rules for mining the data
3	Analyze various classification techniques
4	Discover the knowledge imbibed in the high dimensional system
5	Understand the Fundamentals of Classification and Prediction

INTRODUCTION TO MACHINE LEARNING

Course Objectives	
1	Familiarize the students with basics of probability and statistics required for machine learning
2	Familiarize the students with Machine Learning methods to address data-driven scientific understanding
3	Equip the students with the basic tools of the emerging area
4	Introduce the students with deep learning techniques

Course Outcomes	
After completion of syllabus, the student is able to	
1	Appreciate the importance of visualization in the data analytics solution
2	Apply structured thinking to unstructured problems
3	Understand a very broad collection of machine learning algorithms and problems
4	Learn algorithmic topics of machine learning and mathematically deep enough to introduce the required theory
5	Understand the theoretical foundations of SVMs and the concept of the maximal margin classifier.

Mobile Application & Development (Elective – II)

Course Objectives	
1	To understand and learn programming languages specific to mobile app development.
2	To help students to gain a basic understanding of Android application development
3	To facilitate students to understand android SDK.
4	To Understand Testing Strategies for Android Applications
Course Outcomes	
After completion of syllabus, the student is able to	
1	To Understand Mobile Development Platforms and Tools
2	To design user interfaces (UIs) that are responsive and user-friendly.
3	To design effective and responsive user interfaces using different Android layouts
4	To understand Android SDK

CLOUD COMPUTING (Elective – II)

Course Objective	
1	To provide students with the fundamentals and essentials of Cloud Computing.
2	To provide students a sound foundation of the Cloud computing so that they are able to start using and adopting Cloud Computing services and tools in their real life scenarios.
3	To enable students exploring some important cloud computing driven commercial systems and applications.
4	To expose the students to frontier areas of Cloud Computing and information systems, while providing sufficient foundations to enable further study and research

Course Outcomes	
After completion of syllabus, the student is able to	
1	Apply the fundamental concepts in datacenters to understand the tradeoffs in power, efficiency and cost.
2	Identify resource management fundamentals, i.e. resource abstraction, sharing and sandboxing and outline their role in managing infrastructure in cloud computing.
3	Analyze various cloud programming models and apply them to solve problems on the cloud.
4	Understand and differentiate between various cloud deployment models.

Business Intelligence (Elective – II)

Course Objectives	
1	To understand the fundamentals of Business Intelligence (BI) and its role in effective and timely decision-making.
2	To explore mathematical models and their applications in business decision-making.
3	To gain knowledge of data mining techniques and how they contribute to extracting useful patterns from large datasets.
Course Outcomes	
After completion of syllabus, the student is able to	
1	Explain business intelligence architectures and the ethical considerations in BI implementation.
2	Develop and evaluate mathematical models for decision-making processes.
3	Apply decision support system (DSS) models to real-world business scenarios.
4	Understand and apply relational marketing concepts to enhance customer value and retention.