



School of Computer Science & IT Devi Ahilya Vishwavidyalaya

SYLLABUS

M.Tech Executive (Computer Science) 2 years

Program Educational Objectives (PEOs)

- PEO 1:** Build strong theoretical and practical skills in Computer Science to accelerate career in industry or academia.
- PEO 2:** Demonstrate analytical, research, design, and implementation skills and deal with large- scale projects.
- PEO 3:** Imbibe lifelong learning, professional, and ethical attitude for embracing global challenges.

Program Specific Outcomes (PSOs)

- PSO 1:** Expose industry professionals in the areas of emerging technologies.
- PSO 2:** Implement projects that are industrial strength with a blend of theoretical knowledge gained in academia.

I - SEMESTER

CS-6221: Advanced Algorithm Design

Aim:

The aim of the course is to make students learn & apply algorithmic techniques in problem solving.

Course Outcomes:

- CO 1: Basic data structure and program structures
 - CO 2: Algorithmic techniques like divide & conquer, dynamic , and greedy strategy
 - CO 3: Preliminary graph algorithms and their applications
 - CO 4: Analysis of time and space complexity of known algorithmic techniques
 - CO 5: Application of algorithmic techniques in problem solving
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Unit-I

Introduction to Algorithms, Time & Space Complexity, Sorting: Merge Sort, Quick Sort, Heap Sort; Searching: Linear Search, Binary Search, Hashing.

Unit-II

Dynamic Programming & its Applications: Fibonacci Computation, Longest Common Subsequence Problem, Edit Distance Problem; Greedy Techniques & its Applications: Knapsack Problem.

Unit-III

Graph Algorithms, Traversal: BFS, DFS; Shortest Path: Dijkstra's Shortest Path Algorithm; Computation of Minimum Spanning Trees: Prim Algorithm, Kruskal Algorithm.

Unit-IV

String Matching Algorithms: Naïve Algorithm, KMP Algorithm, Rabin-Karp Algorithm

Unit-V

Theory of NP-Complete Problems, P , NP, NPHard, NP-Complete and related Reductions, Cook's Theorem.

Text Books:

- [1] Introduction to Algorithms, by Cormen, Leiserson, Rivest, and Stein, MITPress,Third Edition, 2009. [CLRS]

Reference Book(s):

CS-6220: Internet Programming Using Java

Aim:

To make students learn fundamental concept of coding and perform them practically and to develop problem-solving skills

Course Outcomes:

- CO 1: Understanding of OOPs concepts clearly
 - CO 2: Understanding of client server architecture and thier working
 - CO 3: Understanding database creating and server technologies
 - CO 4: providing knowledge of advance java concepts like servlet, JSP, etc.
 - CO 5: Understanding of MVC Architecture
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Unit-I

Review of java concepts: Features of Java, Object-oriented programming overview, Introduction of Java Technologies, How to write simple Java programs, Data Types, Variables, Memory concepts, control statements, looping, Method CallStack and Activation Record, Argument Promotion and Casting, Scope of declaration and Method Overloading, String Handling: The String constructors, String operators, Character Exaction, String comparison, String Buffer. Arrays: Declaring and Creating Arrays, Enhanced for Statement, Passing Arrays to Method, Multidimensional Arrays, Variable-Length Argument lists, Using Command-line Arguments

Unit-II

Inheritance: Extending classes & related things, Packages and Interfaces: Defining a Package, Understanding CLASSPATH, Access Protection, Importing packages, creating own packages Exception Handling: Introduction, over view of doing it and keywords used, when to use it, Multithreading: What are threads, The java Thread model, Thread priorities, Thread life cycle, Thread Synchronization, Applets: Applet basics, Applet Architecture, Applet life cycle methods, Database connectivity: JDBC, The design of JDBC, Typical uses of JDBC

Unit-III

Introduction to HTTP, webServer and application Servers, Installation of Application servers, Config files, Web.xml. JavaServlet, Servlet Development Process, Deployment Descriptors, Generic Servlet, Lifecycle of Servlet. Servlet Packages, Classes, Interfaces, and Methods, Handling Forms with Servlet, Various methods of Session Handling, various elements of deployment descriptors.

Unit-IV

JSP Basics: JSP lifecycle, Directives, scripting elements, standard actions, implicit objects. Connection of JSP and Servlet with different database viz. Oracle, MS-SQL Server, MySQL.java.sql Package. Querying database, adding records, deleting records, modifying records, types of Statement. Separating Business Logic and Presentation Logic, Building and using JavaBean. Session handling in JSP, Types of errors and exceptions handling.

Unit-V

MVC Architecture Introduction to Remote Method Invocation, Introduction to Enterprise Java Bean, Types of EJB, Creating and working with Session Bean

Text Books:

1. Java2:The Complete Reference by HerbertSchildt,TataMcGraw-Hill,8th Edition, 2011.
2. K.Mukhar,“BeginningJavaEE5:From Novice to Professional”,WroxPress.

Reference Book(s):

1. The Java Programming Language, Ken Arnold,James Gosling, David Holmes,3rd Edition, Person Education, 2000.
2. Head First Java,Kathy Sierra,Bert Bates,O’Reilly Publication,2ndEdition,2005

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