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| Devi Ahilya University, Indore, India Institute of Engineering & Technology | | | | ME – I Year (Spl Digital Communication) Semester- A | | | | |
| Subject Code & Name | | Instructions Hours per Week | | | Credits | | | |
| DCP2E2 Object Oriented Programming | | L | T | P | L | T | P | Total |
| Duration of Theory Paper: 3 Hours | | 3 | 1 | 2 | 3 | 1 | 1 | 5 |

Course Objectives: The aim of the course is to give a thorough grounding in object-oriented techniques for Java, as well as to examine the major uses of Java – internet programming, design pattern, user interfaces and Networking.

Prerequisite(s): Knowledge Object Oriented Programming concept using object oriented languages such as C++, Objective C.

COURSE CONTENTS

UNIT -I Introduction to Object Oriented Programming and Java :

Object Oriented Concepts, Abstraction, Encapsulation, Information Hiding. Java features: Java syntax, data types, data type conversions, control statements, operators and their precedence. Introduction to Class: Instance members and member functions. Concept of object initialization, constructors, constructor overloading. Access modifiers: Class attributes and methods

UNIT -II

Inheritance and Polymorphism

Class relationships: Inheritance and its types, Merits and Demerits, Polymorphism: Dynamic method dispatch, Runtime polymorphism, Abstract classes, Interfaces and packages.

UNIT -III

Exception Handling, Multithreading and Introduction to Java APIs:

Exceptions: Need for exceptions, Checked V/s Unchecked exceptions, creating exceptions.

Multithreading: Introduction, Priorities and scheduling, Thread Synchronization and its life cycle.

String Handling, Wrapper classes: Arrays and Vectors

UNIT -IV

Java I/O, Applets and Event Handling:

Basic concept of streams I/O stream & reader-writer classes. File handling. Applet and its Life Cycle, Basic GUI elements, Event Delegation Model and event handling

UNIT -V

Introduction to elementary procedures, Real & Complex vector and Matrix & Determinants and operations like: Initialization, Duplication, Elimination, Interchanging, Rotation, Norms, Scaling, Multiplication & calculation of rank etc., Evaluation of various polynomials like Chebyshev polynomial, Fourier polynomial etc., Analysis of real matrix problems like: Overdetermined systems, underdetermined system, homogenous, pseudo inversion. Sparse

Real matrices, Similarity Transformation, Eigen value problems., Numerical differentiation, Differential equations, Introduction to special functions like: Exponential, Gamma, Error, Infinite time series, Fast Fourier transforms etc

BOOKS RECOMMENDED:

- [1] Hang T. Lau, *A Numerical Library in Java for Scientist & Engineers*, Library of Congress Cataloging-in-Publication Data by Chapman & Hall/ CRC Press Company.
- [2] Cay S. Horstmann, *Core JAVA Vol-1*, Pearson Education.
- [3] Herbert Schildt, *The complete Reference*, Tata McGraw Hill.
- [4] Kathy Sierra, Bert Bates, *Head First Java*, 2nd Edition, Oreilly