

<b>Devi Ahilya University, Indore, India Institute of Engineering &amp; Technology</b>				<b>MSc – I Year (Applied Mathematics) with Specialization in Computing &amp; Informatics</b>				
				<b>Semester- II</b>				
<b>Subject Code &amp; Name</b>		<b>Instructions Hours per Week</b>		<b>Credits</b>				
<b>AM2EC1: Object Oriented Programming with Core Java</b>		<b>L</b>	<b>T</b>	<b>P</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>Total</b>
		<b>3</b>	<b>1</b>	<b>-</b>	<b>3</b>	<b>1</b>	<b>-</b>	<b>4</b>
<b>Duration of Theory Paper: 3 Hours</b>								

**Objectives:** To familiarize with the Object oriented concepts through Java programming.

**Prerequisite:** Computer Programming.

### COURSE OF CONTENTS

#### UNIT-I

**Introduction to Java:** Features of Java, Object-oriented programming overview, Introduction of Java Technologies, How to write simple Java programs, Data Types, Variables, Memory concepts, decision making operators, Naming Conventions. . Type conversion & casting, Operators, Control Statements, break and continue Statements. Static Method, static field and Math Class, Argument Promotion and Casting,

#### UNIT-II

**Introduction to Java classes and objects:** Introduction to Class, Objects, Methods and Instance Variables, Primitive type Vs Reference Type, Initializing Objects with Constructors Scope of declaration and Method Overloading.

**String Handling:** The String constructors, String operators, Character Exaction, String comparison, String Buffer.

**Arrays:** Enhanced for Statement, Passing Arrays to Method, Multidimensional Arrays, Variable-Length Argument lists, Using Command-line Arguments. final Instance Variables, this reference, static import, overloaded Constructors, Garbage collection and method finalize, Overloading methods, Parameter passing.

#### UNIT-III

**Inheritance:** Relationship between Superclasses and Subclasses, Using super, Constructor in Subclasses, The Object Class, Object Copying in Java.

**Polymorphism:** Method overriding, upcasting, Dynamic Method Dispatch, final Method and classes, Abstract classes and Methods, instance of operator, Downcasting, Class class, Runtime type Identification

**Packages:** Defining a Package, Understanding CLASSPATH, Access Protection, Importing packages, creating own packages.

**Interfaces** Defining an Interface, Properties of interface, advantages of interface achieving multiple inheritance through interfaces, Variables in Interfaces, Comparable interface.

#### UNIT IV

**Exception Handling:** Introduction, overview of doing it and keywords used, when to use it, Java Exception Hierarchy, finally block, chained exceptions, declaring new exception types, preconditions and postconditions.

**Multithreading:** What are threads, The java thread model, Thread priorities, Thread life cycle, Creating thread and executing thread, Thread Synchronization, producer-consumer problem without Synchronization, Producer-consumer problem with Synchronization, Other class and Interfaces in java.util. concurrent, Monitor and Monitor Locks, Thread Groups, Synchronization, Inter-thread Communication.

#### UNIT V

**Streams and Files:** Introduction, Data Hierarchy, Files and Streams, Sequential-access Text Files, Object Serialization, Random-Access files, Java Stream class Hierarchy.

**Introduction To GUI:** Introduction, Overview of swing Components, Introduction to Event Handling, Common GUI Event Type and Listener Interfaces, How Event Handling Works, Adapter Classes, Layout Managers.

**Applets:** Applet basics, Applet Architecture, Applet life cycle methods, Applet HTML Tag and attributes, Executing applet in web browser and in the applet viewer.

**BOOKS RECOMMENDED:**

- [1] Cay S.Horstmann, Core JAVA Vol-1, Pearson Education, 8<sup>th</sup> Ed., 2008.
- [2] Herbert Schildt, Java: The Complete Reference 7th Edition, Tata McGraw Hill, 2006.
- [3] Scott W Amber, The Object Primer, 2<sup>nd</sup> Ed., Cambridge, 2001.
- [4] Timothy, Budd, Object Oriented Programming, Pearson Education, 2001.
- [5] Kathy Sierra, Bert Bates, Head First Java, 2<sup>nd</sup> Edition, Oreilly , 2005.
- [6] Balagurswamy, Programming with Java, 3<sup>rd</sup> Ed., Tata McGraw-Hill Education, 2006.