Devi Ahilya University, Indore, India Institute of Engineering & Technology				MSc – I Year (Applied Mathematics) with Specialization in Computing & Informatics Semester- IV			
Subject Code & Name	**Instructions Hours per Week**			**Credits**			
AM4EC1: Advanced Java	**L**	**T**	**P**	**L**	**T**	**P**	**Total**
	3	**1**	**-**	**3**	**1**	**-**	**4**
Duration of Theory Paper: 3 Hours							

Learning Objective:

- Learn the fundamentals of JDBC and using the different interfaces in the JDBC API.
- Learn how to use Java servlets in the role of Web application control.
- Identify the options to state management in a Java Web application and understand the pros/cons of each. Understand how JSPs can help to separate Web logic and functionality from page layout.
- Explore how to make JSPs smaller and more powerful with JSTL, custom tags and expression language. Explore strategies in the exchange of data between Web pages (views) and business processing (model).
- Learn the meaning and importance of EJB

Prerequisites: Basic Knowledge of Core Java, an understanding of Web technologies like HTML and HTTP is helpful, prior knowledge of Database will be supportive.

COURSE OF CONTENTS

UNIT I

Advanced I/O Streams: I/O fundamentals, Byte Streams, Character Streams, Node streams, Buffered Streams, Basic Byte Stream Classes, Basic Character Stream Classes. **Networking:** Sockets, Setting up the Connection, Addressing the Connection, Port numbers, Java Networking model, TCP/IP Server and Client, Datagrams, Cookies.

UNIT II

Abstract Windows Toolkit (AWT) : Components and Graphics, Containers, Frames and Panels, Layout Managers, Border layout, Flow layout, Grid layout, Card layout, AWT all components, Event delegation Model, Event source and handler, Event categories, Listeners, interfaces, Anonymous classes, Swing Libraries, Model view Controller design pattern, Different layout, menus dialog boxes, text input.

UNIT III

Introduction to JFC and Swing, Features of the Java Foundation Classes, Swing API Components, JComponent Class, Windows, Dialog Boxes, and Panels, Labels, Buttons, Check Boxes, Menus, Toolbars, Implementing Action interface, Pane, JScrollPane, Desktop pane, Scrollbars, Lists and Combo Boxes, Text-Entry Components, Colors and File Choosers, Tables and Trees, Printing with 2D API and Java Print Service API. **Servlets:** Overview, Servlet Life Cycle, Servlet API, javax.servlet package, javax.servlet.http Package, JSP Page.

UNIT IV

JDBC: Overview, Types of JDBC drivers, JDBC applications, Types of statement objects (Statement, Prepared Statement and Callable Statement), Types of result set, Result Set Metadata, Inserting and updating records, JDBC and AWT, Connection pooling. **RMI:** Introduction & Architecture of RMI, Java RMI classes and interfaces, writing simple RMI application, Parameter passing in remote methods (marshalling and unmarshalling), Using RMI with Applets, Introduction to CORBA.

UNIT V

Introduction to EJB, Benefits of EJB, Types of EJB, Session Bean, Message-Driven Bean, Client **Access with Interfaces:** Remote Access, Local Access, Local Interfaces and Container-Managed Relationships, Web

Service Clients, Method Parameters and Access, The Contents of an Enterprise Bean, Naming Conventions for Enterprise Beans, The Life Cycles of Enterprise Beans, The Life Cycle of a Stateful and Stateless Session Bean, The Life Cycle of a Message-Driven Bean Building Web Services with JAX-WS: Setting the Port, Creating a Simple Web Service and Client with JAX-WS.

Learning Outcomes:

Upon completing the course, students will be able to:

- Develop Swing-based GUI
- Develop client/server applications and TCP/IP socket programming
- Update and retrieve the data from the databases using SQL
- Develop distributed applications using RMI
- Develop component-based Java software using JavaBeans
- Develop server side programs in the form of servlets

BOOKS RECOMMENDED:

[1] Herbert Schildt, Java: The Complete Reference 7th Edition, Tata McGraw Hill, 2006.
[2] Dustine R Callway, Inside Servlets, Addison-Wesley, 2001.
[3] James Goodwill, Developing Java Servlets. 2nd Ed., Sams, 2001.
[4] Chad Darby, John Griffin, Pascal de Haan, Beginning Java Networking, Wrox Press, 2001.
[5] Jim Keogh, Complete Reference- J2EE, ata McGraw-Hill Education, 2002.