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| Program: B.Sc.- Computer Science | | | | Semester : IV | |
| Course: Advanced Java | | | | Course Code: USMACS402 | |
| Teaching Scheme | | | | Evaluation Scheme | |
| Lecture (Hours per week) | Practical (Hours per week) | Tutorial (Hours per week) | Credit | Continuous Assessment and Evaluation (CAE) (Marks - 25) | Term End Examinations (TEE) (Marks-75 in Question Paper) |
| 02 | 02 | - | 2+1 | 25 | 75 |
| Learning Objectives: | | | | | |
| <ul style="list-style-type: none">• To Explore swing API for building GUI applications.• To Understand the Java Database Connectivity.• To Understand Web application development using Servlet, JSP and struts2. | | | | | |
| Course Outcomes: | | | | | |
| After completion of the course, learners would be able to: | | | | | |
| CO1: Apply swing concepts for creating GUI java applications. | | | | | |
| CO2: Implement database connectivity with JDBC. | | | | | |
| CO3: Explore servlets, JSP for web development. | | | | | |
| CO4: Recognize java beans, struts2 framework and JSON format. | | | | | |
| Outline of Syllabus: (per session plan) | | | | | |
| Module | Description | | | | No of hours |
| 1 | GUI using Swing & JDBC | | | | 10 |
| 2 | Web Application development with Servlet & JSP | | | | 10 |
| 3 | Java Struts2 framework & JSON | | | | 10 |
| | Total | | | | 30 |
| PRACTICALS | | | | | 30 |

| Module | Advanced Java | No. of Hours/Credits 30/2 |
|---------------|--|--|
| 1 | GUI using Swing & JDBC | 10 |
| | <p>Swing: Need for swing components, Difference between AWT and swing, Components hierarchy, Panes; Swing components: JLabel, JTextField and JPasswordField, JTextArea, JButton, JCheckBox, JRadioButton, JComboBox and JList.</p> <p>JDBC: Introduction, JDBC Architecture, Types of Drivers, Statement, ResultSet, Read Only ResultSet, Updatable ResultSet, Forward Only ResultSet, Scrollable ResultSet, PreparedStatement, Connection Modes, SavePoint, Batch Updatations, CallableStatement.</p> | |
| 2 | Web Application development with Servlet & JSP | 10 |
| | <p>Servlets: Introduction, Http Methods, Web Server & Web Container, Servlet Interface, GenericServlet, HttpServlet, Servlet Life Cycle, ServletConfig, ServletContext, Servlet Communication, Session Tracking Mechanisms</p> <p>JSP: Introduction, JSP LifeCycle, JSP Implicit Objects & Scopes, JSP Directives, JSP Scripting Elements, JSP Actions: Standard actions and customized actions.</p> | |
| 3 | Java Beans, Struts2 framework & JSON | 10 |
| | <p>Java Beans:-Introduction to JavaBeans-Properties-</p> <p>Struts 2: Basic MVC Architecture, Struts 2 framework features, Struts 2 MVC pattern, Request life cycle, Examples, Configuration Files, Actions, Interceptors, Results & Result Types, Value Stack/OGNL.</p> <p>JSON: Overview, Syntax, Data Types, Objects, Schema, Comparison with XML, JSON with Java.</p> | |

| PRACTICALS | |
|-------------------|--|
| Sr. No. | Topic. |
| 1 | Develop the presentation layer of Library Management software application with suitable menus. |
| 2 | Develop business logic layer for Library Management System:-1. |
| 3 | Develop business logic layer for Library Management System:-2. |
| 4 | Write a Java application to demonstrate servlet life cycle. |
| 5 | Design a servlet session management application using all the 4 types studied. |
| 6 | Implement CRUD operations using servlet(s). |
| 7 | Implement CRUD operations using JSP(s). |
| 8 | Write a Student class with three properties. The useBean action declares a JavaBean for use in a JSP. Write Java application to access JavaBeans Properties. |
| 9 | Design application using Struts2. Application must accept user name and greet user when command button is pressed. |
| 10 | Demonstrate a MVC application using Struts2. |

RECOMMENDED READING:

Textbooks:

- 1) Cay S. Horstmann, Gary Cornell, Core Java™ 2: Volume II–Advanced Features Prentice Hall PTR, 9th Edition
- 2) Herbert Schildt, Java2: The Complete Reference, Tata McGraw-Hill, 5th Edition
- 3) Joe Wigglesworth and Paula McMillan, Java Programming: Advanced Topics, Thomson Course Technology (SPD), 3rd Edition.

Reference Books:

- 1) Advanced Java Programming, Uttam K. Roy, Oxford University Press
- 2) The Java Tutorials: <http://docs.oracle.com/javase/tutorial/>
- 3) The Java Tutorials of Sun Microsystems Inc