Uka Tarsadia University

B. Tech.

Semester VI

ADVANCED JAVA TECHNOLOGIES

XXXXXX

EFFECTIVE FROM July-2021

Syllabus version: 1.00

Subject Code	Subject Title	Teaching Scheme			
		Hours		Credits	
		Theory	Practical	Theory	Practical
XXXXXX	Advanced Java Technologies	3	2	3	1

Subject Code	Subject Title	Theory Examination Marks		Practical Examination Marks	Total Marks
		Internal	External	CIE	
XXXXXX	Advanced Java Technologies	40	60	50	150

Objectives of the course:

- To equip the students with the advanced feature of contemporary Java which would enable them to handle complex programs relating to sending and receiving mail, managing data and processes over the network.
- To understand the concept of design pattern which provides a general reusable solution for the common problems.
- To explain concepts of web application development in Java, so one can develop JSP and Java servlet based web applications.

Course outcomes:

Upon completion of the course, the student shall be able to

CO1: Design a network for sending or receiving data using TCP/IP socket programming as well as distributed applications using RMI.

CO2: Integrate Java and data base management concepts to store data using Java programming.

CO3: Learn the basic concepts of design pattern in Java.

CO4: Construct server-side web programs using servlet.

CO5: Develop web applications using Java Servlet Pages.

CO6: Explain the concepts of Java mail API.

Sr. No.	Topics	Hours
	Unit – I	
1	**Java Network Programming:** Network programming with java.net package, Client programs and server programs using TCP and UDP, Content and protocol handlers, RMI architecture, RMI registry, Writing distributed application with RMI, Naming and directory services, Overview of JNDI, Object serialization and internationalization.	8
	Unit – II	

2	**J2EE and JDBC :** J2EE architecture, Enterprise application concepts, n-tier application concepts, J2EE platform, HTTP protocol, Web application, Web containers and application servers, Introduction to Java database programming, JDBC driver types, Steps to connect JDBC, JDBC statement interface, JDBC prepared statement interface, JDBC callable statement interface, Transaction management, Java beans.	9
Unit – III		
3	**Java Design Patterns:** Overview, Advantages of design patterns, Different types of design patterns - Creational Pattern, Factory method pattern, Abstract factory pattern, Singleton pattern, Prototype pattern, Builder pattern, Object pool pattern; Structural pattern - Adapter pattern, Bridge pattern, Composite pattern, Decorator pattern, Facade pattern, Flyweight pattern, Proxy pattern; Behavioral pattern - Chain of responsibility, Command pattern, Interpreter pattern, Iterator pattern, Mediator pattern, Memento pattern, Observer pattern, State pattern, Strategy pattern, Template pattern.	6
Unit – IV		
4	**Java Servlet:** Overview of java servlet, Servlet API, Servlet lifecycle, Deployment descriptor, Servlet configuration and context objects, Request and Response objects, The filter API - Filter, FilterChain, FilterConfig; Cookies and Session management - Understanding state and session, Understanding session timeout, Session tracking, URL rewriting.	8
Unit – V		
5	**Java Server Pages:** JSP architecture, JSP page life cycle, JSP tags and implicit objects, Action tags in JSP, JSP unified EL, JSP function with EL, JSP elements, Expression language, Tag extensions, Tag extension API, Tag handlers, JSP fragments, Tag files, JSTL, Core tag library, Overview of XML tag library, SQL tag library, Functions tag library.	9
Unit – VI		
6	**Java Mail API:** Basics of java mail API, Protocols used in java mail API, Java mail architecture, Sending email with/without attachment, Receiving email with/without attachment, Forwarding email, Deleting email.	5

Sr. No.	Advanced Java Technologies (Practical)	Hours
1	Create GUI application using Swing which contains following components: text field, text area, radio button, check box, combo box, button and menubar. When user click on submit button new window should be opened. The menubar contains two operations: File, Edit. The Edit menu contains three menu items: cut, copy and paste. When user click on Edit menu respective operation should be performed.	4
2	Create one application that includes following classes: a) Create Servlet file which contains following functions: 1. Connect 2. Create Database 3. Create Table 4. Insert Records into respective table 5. Delete table and also database. b) Create Servlet file which contains following functions using Statement, Prepared statement and Callable statement: 1. Update records of particular table of database 2. Delete Records from table. c) Create login form and perform state management using Cookies, HttpSession. d) Implement Authentication filter using filter API.	6
3	Create one application to demonstrate the followings by using JSP: a) Demonstrate use of JSP operator. b) Demonstrate use of JSP Beans. c) Create a Login Application using JSP. d) Demonstrate all JSTL with suitable code.	4
4	Write a TCP Client server program where client sends one statement to the server and in response server will arrange that statement in alphabetical order to the client. Write a UDP Client server program where client sends statement to the server and in response server will return count of vowels and consonant.	4
5	Make RMI application where client sends encrypted message to the server and in response server will decrypt the message and send back to the client.	4
6	Create GUI given as below and send an email to a recipient email id and display a message “Your mail sent successfully”.	4
7	Write a java program to read last email from inbox of your email account and display on terminal.	4

Text books:

1. Kogent Learning Solutions Inc. - “Java 6 Programming”, Black Book, Dreamtech.

2. Matha Mahesh P. - "Object-Oriented Analysis and Design Using UML: An Introduction to Unified Process and Design Patterns", PHI Learning Private Limited, 2008.

Reference books:

1. Gary Cornell, Cay S. Horstmann – "Core Java", Volume II, Advanced Features, 8th Edition, Pearson.
2. Kogent Learning Solutions Inc. – "Java Server Programming "- Java EE6 (J2EE 1.6), Black Book, Dreamtech.
3. Joe Wigglesworth and Paula McMillan – "Java Programming Advance Topics ", Cengage Learning.
4. Jamie Jaworski – "Unleashed Java 2 Platform", Sams Techmedia.
5. James Keogh - "The Complete Reference J2EE", Keogh, McGraw Hill.
6. Bayross and Shah – "Java EE 5 for beginners", SPD.
7. Bernand Van Haecke – "JDBC 3 Java Database Connectivity", Wiley Dreamtech.
8. Bayross and Shah - "Java Server Pages for Beginners", SPD.
9. Jason Hunter – "Java Servlet Programming", SPD.

Course objectives and Course outcomes mapping:

- To equip the students with the advanced feature of contemporary Java which would enable them to handle complex programs relating to sending and receiving mail, managing data and processes over the network. – CO1, CO2, CO6
- To understand the concept of design pattern which provides a general reusable solution for the common problems. – CO3
- To explain concepts of web application development in Java, so one can develop JSP and Java servlet based web applications. – CO4, CO5

Course units and Course outcomes mapping:

Unit No.	Unit Name	Course Outcomes					
		CO1	CO2	CO3	CO4	CO5	CO6
1	Java Network Programming	✓					
2	J2EE and JDBC		✓				
3	Java Design Patterns			✓			
4	Java Servlet				✓		
5	Java Server Pages					✓	
6	Java Mail API						✓

Programme outcomes:

PO 1: Engineering knowledge: An ability to apply knowledge of mathematics, science, and engineering.

PO 2: Problem analysis: An ability to identify, formulates, and solves engineering problems.

PO 3: Design/development of solutions: An ability to design a system, component, or process to meet desired needs within realistic constraints.

PO 4: Conduct investigations of complex problems: An ability to use the techniques, skills, and modern engineering tools necessary for solving engineering problems.

PO 5: Modern tool usage: The broad education and understanding of new engineering techniques necessary to solve engineering problems.

PO 6: The engineer and society: Achieve professional success with an understanding and appreciation of ethical behaviour, social responsibility, and diversity, both as individuals and in team environments.

PO 7: Environment and sustainability: Articulate a comprehensive world view that integrates diverse approaches to sustainability.

PO 8: Ethics: Identify and demonstrate knowledge of ethical values in non-classroom activities, such as service learning, internships, and field work.

PO 9: Individual and team work: An ability to function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO 10: Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give/receive clear instructions.

PO 11: Project management and finance: An ability to demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO 12: Life-long learning: A recognition of the need for, and an ability to engage in life-long learning.

Programme outcomes and Course outcomes mapping:

Programme Outcomes	Course Outcomes					
	CO1	CO2	CO3	CO4	CO5	CO6
PO1						
PO2	√	√	√	√	√	√
PO3	√	√	√	√	√	√
PO4						
PO5				√	√	
PO6						
PO7						
PO8						
PO9						
PO10						
PO11						
PO12						