

# GUJARAT TECHNOLOGICAL UNIVERSITY

## COMPUTER ENGINEERING (07)

ADVANCED JAVA

SUBJECT CODE: 2160707

B.E. 6<sup>th</sup> SEMESTER

**Type of course:** Core

**Prerequisite:** NA

**Rationale:** NA

**Teaching and Examination Scheme:**

Teaching Scheme			Credits	Examination Marks						Total Marks
L	T	P	C	Theory Marks			Practical Marks			
				ESE (E)	PA (M)		ESE (V)		PA (I)	
					PA	ALA	ESE	OEP		
4	0	2	6	70	20	10	20	10	20	150

**Content:**

Sr. No.	Content	Total Hrs	% Weightage
1	Java Networking Network Basics and Socket overview, TCP/IP client sockets, URL, TCP/IP server sockets, Datagrams, java.net package Socket, ServerSocket, InetAddress, URL, URLConnection	06 Hrs	5
2	JDBC Programming The JDBC Connectivity Model, Database Programming: Connecting to the Database, Creating a SQL Query, Getting the Results, Updating Database Data, Error Checking and the SQLException Class, The SQLWarning Class, The Statement Interface, PreparedStatement, CallableStatement The ResultSet Interface, Updatable Result Sets, JDBC Types, Executing SQL Queries, ResultSetMetaData, Executing SQL Updates, Transaction Management.	08Hrs	10
3	Servlet API and Overview  Servlet Model: Overview of Servlet, Servlet Life Cycle, HTTP Methods Structure and Deployment descriptor ServletContext and ServletConfig interface, Attributes in Servlet, Request Dispatcher interface The Filter API: Filter, FilterChain, Filter Config Cookies and Session Management: Understanding state and session, Understanding Session Timeout and Session Tracking, URL Rewriting	10 Hrs	25
4	Java Server Pages JSP Overview: The Problem with Servlets, Life Cycle of JSP Page, JSP Processing, JSP Application Design with MVC, Setting Up the JSP Environment	10 hrs	25

	JSP Directives, JSP Action, JSP Implicit Objects JSP Form Processing, JSP Session and Cookies Handling, JSP Session Tracking JSP Database Access, JSP Standard Tag Libraries, JSP Custom Tag, JSP Expression Language, JSP Exception Handling, JSP XML Processing.		
<b>5</b>	Java Server Faces2.0 Introduction to JSF, JSF request processing Life cycle, JSF Expression Language, JSF Standard Component, JSF Facelets Tag, JSF Converter Tag, JSF Validation Tag, JSF Event Handling and Database Access, JSF Libraries: PrimeFaces	<b>04 Hours</b>	10
<b>6</b>	Hibernate 4.0 Overview of Hibernate, Hibernate Architecture, Hibernate Mapping Types, Hibernate O/R Mapping, Hibernate Annotation, Hibernate Query Language	<b>8 Hrs</b>	15
<b>7</b>	Java Web Frameworks: Spring MVC Overview of Spring, Spring Architecture, bean life cycle, XML Configuration on Spring, Aspect – oriented Spring, Managing Database, Managing Transaction	<b>08 Hrs</b>	10

**Suggested Specification table with Marks (Theory):**

<b>Distribution of Theory Marks</b>					
R Level	U Level	A Level	N Level	E Level	C Level
<b>10</b>	<b>30</b>	<b>30</b>	<b>-</b>	<b>-</b>	<b>-</b>

**Legends: R: Remembrance; U: Understanding; A: Application, N: Analyze and E: Evaluate C: Create and above Levels (Revised Bloom's Taxonomy)**

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

**Reference Books:**

1. Black Book “ Java server programming” J2EE, 1st ed., Dream Tech Publishers, 2008. 3. Kathy walrath ”
2. Complete Reference J2EE by James Keogh mcgraw publication
3. Professional Java Server Programming by Subrahmanyam Allamaraju, Cedric Buest Wiley Publication
4. SCWCD, Matthew Scarpino, Hanumant Deshmukh, Jignesh Malavie, Manning publication
5. Core Java, Volume II: Advanced Features by Cay Horstmann and Gary Cornell Pearson Publication
6. Java Persistence with Hibernate by Christian Bauer, Gavin King
7. Spring in Action 3<sup>rd</sup> edition , Craig walls, Manning Publication
8. Hibernate 2<sup>nd</sup> edition, Jeff Linwood and Dave Minter, Beginning Après publication
9. Java Server Faces in Action, Kito D. Mann, Manning Publication
10. JDBC™ API Tutorial and Reference, Third Edition, Maydene Fisher, Jon Ellis, Jonathan Bruce, Addison Wesley
11. Beginning JSP, JSF and Tomcat, Giulio Zambon, Apress
12. JSF2.0 CookBook, Anghel Leonard, PACKT publication

## **Course Outcome:**

Upon completion of this course, students will be able to do the following:

1. Use various tools, and Validation techniques, use of different templates available in IntelliJ IDEA, Implementation and testing strategies in real time applications.
2. Use advanced concepts related to Web Services, spring and Hibernate.

## **List of Experiments:**

### **Socket Programming(TCP/UDP)**

- 1) Create chat application using either TCP or UDP protocol.
- 2) Implement TCP Server for transferring files using Socket and ServerSocket
- 3) Implement any one sorting algorithm using TCP/UDP on Server application and Give Input On Client side and client should sorted output from server and display sorted on input side.
- 4) Implement Concurrent TCP Server programming in which more than one client can connect and communicate with Server for sending the string and server returns the reverse of string to each of client
- 5) Write RMI application where client supplies two numbers and server response by summing it. Provide your custom security policy for this application.
- 6) Implement Student information system using JDBC and RMI.

### **JDBC/Servlet**

- 7) Create Servlet file which contains following functions:
  1. Connect 2. Create Database 3. Create Table 4. Insert Records into respective table 5. Update records of particular table of database 6. Delete Records from table. 7. Delete table and also database.
- 8) User can create a new database and also create new table under that database. Once database has been created then user can perform database operation by calling above functions. Use following Java Statement interface to implement program:
  1. Statement 2. Prepared statement 3. Callable statement
- 9) Create Servlet file and study web descriptor file.
- 10) Create login form and perform state management using Cookies, HttpSession and URL Rewriting.
- 11) Implement Authentication filter using filter API.
- 12) Create database of student subject-wise data and retrieve all data using JSP and generate xml structure along with DTD and XML Schema definition
- 13) Refer Practical 11 and apply XSLT (Style) to generated xml document and print your result.
- 14) Create web service which provides student information.
- 15) Create Web Service client which consume above service and display student data by entering student id.
- 16) Study and implement Hibernate
- 17) Study and Implement MVC using Spring Framework

## **Design based Problems (DP)/Open Ended Problem:**

- 1) Using J2EE JSP/Servlet API develop student's management system required to manage student's academic activity such as student's profile, student's day to day assignment submission as per instructions and assignment given by teacher . Provide MVC based interface using spring framework and do the database design using Hibernet framework and also provide two login roles

one for teachers providing assignment and notification for class and other for students to submit their assignments and can view notices published by teachers

- 2) Develop the students blog and online forum where various group of students can do discussion on various academic and non-academic but technical topics discussions group where all of college teachers can provide comments and likes and dislikes. Use Spring base and Hibernet technology for MVC framework and database design respectively

**ACTIVE LEARNING ASSIGNMENTS:** Preparation of power-point slides, which include videos, animations, pictures, graphics for better understanding theory and practical work – The faculty will allocate chapters/ parts of chapters to groups of students so that the entire syllabus to be covered. The power-point slides should be put up on the web-site of the College/ Institute, along with the names of the students of the group, the name of the faculty, Department and College on the first slide. The best three works should submit to GTU.