GUJARAT TECHNOLOGICAL UNIVERSITY

Syllabus for Master of Computer Applications, 4th Semester
Subject Name: Java Web Technology (JWT)
Subject Code: 4649305

With effective from academic year 2018-19

1. **Learning Objectives:**

- To learn and work with the web components of Java EE. i.e. the Servlet specification.
- Student will be able to learn MVC architecture and develop dynamic web application using Java Servlet and Java Server Pages technology.

2. **Prerequisites:** Programming Language of JAVA, HTML, JavaScript and JDBC

3. **Contents:**

Unit	Course Content	Weightage Percentage
Unit I	**Servlet Basics, Handling the Client Request: Form Data, HTTP Request Headers** Servlet Basics, Basic Servlet structure, Servlets Generating text/html content, Packaging Servlets, The servlet life-cycle. Handling Client Request Form Data, Reading Form Data from Servlets, Handling Client Request: Reading Request Headers, Understanding HTTP/1.1 Request Headers: Changing the page according to how the user got there and accessing the Standard CGI Variables.	**20%**
Unit II	**Server Response, HTTP Status Codes, HTTP Response Headers, Handling Cookies and Session Tracking** Specifying Status Codes, HTTP / 1.1 Status Codes, Using Redirections, HTTP Response Headers: Setting Response Headers from Servlets, Understanding HTTP / 1.1 Response Headers, Using Servlets to Generate JPEG Images, Handling Cookies: Remembering Usernames and Passwords, Deleting Cookies, Sending and Receiving Cookies, Using Cookie Attributes, Differentiating Session Cookies from Persistent Cookies, Using Cookies to Remember User Preferences, Session Tracking: Need for Session Tracking, Session Tracking API, Encoding URLs Sent to the Client and accumulating a List of User Data.	**20%**
Unit III	**Listeners and Filters** Using ServletContextListener, HttpSessionListener, Understanding of all the other Listeners viz. ServletRequestListener, ServletContextAttributeListener, ServletRequestAttributeListener, HttpSessionAttributeListener. Using Filters for pre and post processing of request.	**10%**
Unit IV	**Overview of Java Server Pages, Java Code with JSP Scripting, JSP Page Directives, Files and Applets in JSP and Java Beans Components in JSP** JSP Basic Syntax, HTML Text, HTML comments, Template Text, JSP Comment, JSPExpression, JSP Scriptlet, JSP Declaration, JSP 08 Directives, JSP Action, JSP Expression Language Element, Custom Tag (Custom Action), Escaped Template Text, Using JSP Scripting Elements, Using Predefined Variables, XML syntax for Expressions, Scriptlets, Declarations and Directives, Using Scriptlets, Using Declarations, Using Page Directive, Using Standard Actions Tags<jsp:plugin>, <jsp:forward>,<jsp:include>,	**20%**

	Using JavaBeans in JSP pages – <jsp:useBean>, <jsp:getProperty>, <jsp:setProperty>,Sharing Beans, Use of Scopes and their Attributes.	
Unit V	**Model-View-Controller (MVC), JSP 2.0 Expression and Accessing Database with JDBC** Integrating Servlets and JSP in a Web Application (MVC Architecture for Web Applications), Implementing MVC with Request Dispatcher, Understanding Data Sharing Between Servlets and JSP, JSP Expression Language, Accessing Scoped Variables, Bean Properties, Collections and Implicit Objects Using EL, Using EL Operators and Accessing Database with JDBC.	**20%**
Unit VI	**Declarative Security and Programmatic Security** Form-based authentication, Basic authentication, example, configuration Tomcat to use SSL, programmatic Security, Example, Handling all security programmatically, Example, Using programmatic security with SSL.	**10%**

4. Text Book(s):

1) Marty Hall, Larry Brown, "Core Servlets and JavaServer Pages Volume – 1", Pearson Education, 2nd ed.(2004)
2) Marty Hall, Larry Brown, Yaakov Chaikin, "Core Servlets and JavaServer Pages Volume – 2", Pearson Education, 2nd ed.(2004)

5. Reference Books:

1) Black Book "Java server programming" J2EE, 1st ed., Dream Tech Publishers, 2008.
2) Subrahmanyam Allamaraju, Cedric Buest, Professional Java Server Programming, Wiley Publication
3) Pravin Jain, The Class of Java, Pearson
4) Christian Bauer, Gavin King , Java Persistence with Hibernate, MANNING
5) Giulio Zambon, Beginning JSP, JSF and Tomcat, Apress
6) Cay S. Horstmann, "Core Java , Volume I – Fundamentals", Pearson Education , 10th Edition, 2017
7) Cay S. Horstmann, "Core Java , Volume II – Advanced Features", Pearson Education , 10th Edition, 2017
8) Cay Horstmann and Gary Cornell, Core Java, Volume II: Advanced Features, Pearson Publication
9) James Keogh ,Complete Reference J2EE, McGraw-Hill publication

Web Resources
http://docs.oracle.com/javaee/6/tutorial/doc/bnafd.html

6. Chapter wise Coverage from the Text Book:

Unit #	Book#	Chapter
I	1	Chapter 3 (except 3.5, 3.7, 3.8), Chapter 4 (only 4.2), Chapter 5 (only 5.1, 5.3, 5.6 and 5.7),
II	1	Chapter 6 (except 6.4), Chapter 7 (only 7.1, 7.2 and 7.5), Chapter 8

		(only 8.1, 8.3, 8.4, 8.6, 8.7, 8.11), Chapter 9 (only 9.1, 9.3, 9.5, 9.7)
III	2	Chapters 5, 6
IV	1	Chapters 10 (only 10.6), 11, 12, 13, 14
V	1	Chapters 15, 16, 17
VI	2	Chapters 3 (3.1 to 3.5), 4 (4.1 to 4.5)

7. Accomplishments

Students will understand advanced concepts related to MVC architecture, web services, servlet, spring and Hibernate. Students will be able to develop dynamic web applications using Java technology without need of other's help.

Practical List

1) Write a Servlet to display "Hello World" on browser.
2) Write a Servlet to display all the headers available from request.
3) Write a Servlet to display parameters available on request.
4) Write a Servlet to display all the attributes available from request and context.
5) Write a Servlet which displays a message and also displays how many times the message has been displayed (how many times the page has been visited).
6) Assume that we have got three pdf files for the MCA-1 Syllabus, MCA-2 Syllabus and MCA-3 Syllabus respectively, Now write a Servlet which displays the appropriate PDF file to the client, by looking at a request parameter for the year (1, 2 or 3).
7) Assume that the information regarding the marks for all the subjects of a student in the last exam are available in a database, Develop a Servlet which takes the enrollment number of a student as a request parameter and displays the marksheet for the student.
8) Develop a Servlet which looks for cookies for username and password, and forwards to a home.jsp in case the cookies are valid and forwards to login.jsp, in case the cookies are not found or the cookies are not valid.
9) Write a servlet to implement Session tracking using all four methods.
10) Develop a Servlet to authenticate a user, where the loginid and password are available as request parameters. In case the authentication is successful, it should setup a new session and store the user's information in the session before forwarding to home.jsp, which displays the user's information like full name, address, etc.
11) Write a simple JSP page to display a simple message (It may be a simple html page).
12) Write a JSP page, which uses the include directive to show its header and footer.
13) Create a listener that notifies (through System.out) whenever a user adds a product to a shopping cart (i.e. adds an object to the session object) or removes it again. Hint: check out the class HttpSessionAttributeListener. Make it print the name and price of the object (hint: access the session through the HttpBindingEvent object). Also, let the listener print the total price of all objects saved in the session so far (one way to accomplish this could be to keep a collection of all objects saved to the session – or just their keys – in the listener or an associated class).
14) Create a servlet filter that logs all access to and from servlets in an application and prints the following to System.out:

1. the time the request was received
2. the time the response was sent
3. how much time it took to process the request
4. the URL of the resource requested
5. the IP address of the visitor

15) Develop a interest calculation application in which user will provide all information in HTML form and that will be processed by servlet and response will be generated back to the user.
16) Develop an application to demonstrate how the client (browser) can remember the last time it visited a page and displays the duration of time since its last visit. (Hint: use Cookie)
17) Develop an application to keep track of one user across several servlet invocations within the same browser session.
18) Develop an application to write a "page-composite" JSP that includes other pages or passes control to another page. (Hint: Use <jsp:include> or <jsp:forward>).
19) You want to reduce the amount of Java coding in your JSP using a JavaBean component. (Hint: Use <jsp:useBean> with the name of your bean).

20) Write a JSP page which uses tags available from the standard tag library JSTL.
21) Update the JSP page from above exercise to use tags availabe from the standard tag library JSTL.
22) Develop a JSP Page to display the personal information and result information of the student in two different tabular formats.
23) Create the filter that can add the time at which above jsp file called with appropriate message.
24) Design a Listener that loads the name of company as an init-parameter in context.
Use this name on the JSP – product.jsp and contactus.jsp of the website. (HINT: Implement ServletContextListener interface)
25) Create a filter to maintain the log of suspicious access of a particular JSP.
Access to the JSP on Sundays is suspicious.
Also design the JSP for the application. The JSP should display the details about sales history of the company for past 7 years.
The output should be shown in excel format.
26) Design an application where a user enters username and password, and requests for a servlet. Use filter to validate the password use database. If password is valid servlet is given as response, otherwise give appropriate message through filter.
27) Develop a program to perform the database driven operation like insert, Delete, Update and select. To perform the above operations create one table named Employee.

Field Name	**Field Type**
EmpId	Integer
Empname	Varchar
Emp_desig	Varchar
Emp_J_Date	Varchar
Emp_Salary	Numeric

28) Write a Java application to invoke a stored procedure using a CallableStatement. For this a stored procedure called increment Salary may be developed to increase all the employees salary by a percentage specified in the parameter.
29) Write a Servlet which uses the concept of Request forwarding & including external source in the current servlet context.
30) Write a JSP Page to which uses Session Tracking for online shopping.

Note: Some of the practicals form the above practical list may have seemingly similar definitions. For better learning and good practice, it is advised that students do maximum number of practicals. In the practical examination, the definition asked need not have the same wordings as given in the practical list. However, the definitions asked in the exams will be similar to the ones given in the practical list.