VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT

M.Sc.(I.C.T.) (1ˢᵗ Semester)

Paper: 101 / Subject: Java Web Development

Effective From: June 2014

Credits: 4   **Total Hrs.: 04**

Objective: **To understand and implement the Web Oriented Project Development Model of Java.**

Pre-requisite: **Understanding of OOP concept and its implementation by Java Language**

1 JAVA WEB ARCHITECTURE

1.1   The Java Advantage for Web,
1.2   Java Editions, JAVA Enterprise Edition
1.3   Java EE Web Architecture,
1.4   Java Web Application Servers,
1.5   Installing and Configuring
1.6   Glassfish Application Server,
1.7   Java EE APIs for Building web Applications,
1.8   IDEs for Enterprise Application Development

2 JAVA DATABASE PROGRAMMING

2.1   The 2-Tier Client Server Architecture,
2.2   Java Dabase Connectivity (JDBC) – API for Accessing Databases,
2.3   Database Drivers, Loading a Driver Class,
2.4   Connecting the Database Server,
2.5   Making the Query with Statement Object,
2.6   Getting the data - The ResultSet Object
2.7   Writing the First Database Application,
2.8   More about ResultSet, Making the Faster Execution with PreparedStatement Object,
2.9   Data about Data - The ResultSetMetaData Object
2.10   Java-SQL Data Types, Manipulating the Data with JDBC- Insert, Update and Delete
2.11   Batching the Operations ,
2.12   Calling Stored Procedures and Functions – The CallableStatement Object,
2.13   Handling Database Transactions, A Sample Database Application

3 JAVA SERVLETS
3.1   Introduction to Java Servlets
3.2   The Java Servlet API, Writing Your First Servlet,
3.3   Deploying the Java Web Application ,
3.4   The Servlet Life Cycle, CGI and Servlets,
3.5   Request and Response
3.6   Getting Values from Forms and QueryStrings,
3.7   Working with Databases, Working with HTTP Headers ,

3.8   Remembring the State with Cookies,
3.9   Using Hidden Fields,
3.10 Session Tracking and Management ,
3.11 ServletContext and ServletConfig,
3.12 Initalisation Parameters, Inter-Servlet Communication with Request
3.13 Dispaching and Forwarding, Filters, Web Listeners,
3.14 Writing Deployment Descriptor, A Sample Servlet Project,
3.15 Packaging the Application with ANT
3.16 Deploying and Running the Project

4 JAVA SERVER PAGES

4.1   Introduction to Java Servlets
4.2   Overview of Java Server Pages (JSP) ,
4.3   How JSP Works, JSP Page Directives,
4.4   The Declaration Element, The Scripting Elements ,
4.5   Writing your First JSP, The Action tags
4.6   The Implicit Objects, Handling the HTML Form Submission,
4.7   The Assignmet Tag, The Form Validation with Java Bean,
4.8   Working with Java Beans, Working with Plugins ,
4.9   Working with application ,
4.10 session and page , A Complete JSP Application

5   JSTL AND EL
5.1   Introduction to Java Standard Tag Library,
5.2   Using JSTL in JSP, Response with JSTL,
5.3   EL – The Expression language,
5.4   Variable Assignment with *set* Tag,
5.5   Handling Request and Response with JSTL/EL,
5.6   The Logic and The Iteration with JSTL,
5.7   Working with Property Files,
5.8   Internationalisation and Localisation with fmt Tag,
5.9   Managing Session and Application Attributes,
5.10 Working with Databases, Working with XML,
5.11 A JSTL/EL Application

6 **The Java Web Application Frameworks**
6.1   Action Based Framework – SPRING/STRUTS
6.2   Component Based Framework - JAVA SERVER FACES

References :
1. Head First Servlets and JSP By: Bryan Basham, Kathy Sierra, Bert Bates Publisher: 'Reilly Media | ISBN 10: 0-596-00540-7 | ISBN 10: 0-596-55633-0
2. Core Servlets and Javaserver Pages: Author Marty Hall , Larry Brown , Sun Micro System
3. Java Servlet & JSP Cookbook by Bruce W. Perry O;reilly Publication
4. Beginning JSP™, JSF™ and Tomcat™ Web Development: From Novice to Professional by Giulio Zambon and Michael Sekler

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT

M.Sc.(I.C.T.) (1st Semester)

Paper: 102 / Subject: Enterprise Java

Effective From: June 2014

Credits: 4   **Total Hrs.: 04**

Objective: **To understand and implement the N-Layered Enterprise Architecture of Java**

Pre-requisite: **Understanding of OOP concept and its implementation by Java Language and Java Web Architecture**

1 INTRODUCTION TO JAVA EE
   1.1   Tiered model architectures – principles and goals ,
   1.2   Java EE definition and characteristics
   1.3   Java EE technologies in a multi-tier architecture

2 JAVA NAMING AND DIRECTORY INTERFACES
   2.1   Locating objects using JNDI ,
   2.2   Definition and structure of JNDI ,
   2.3   Naming and Directory Services ,
   2.4   Context, initial context and JNDI tree

3 ENTERPRISE JAVA BEANS
   3.1   Stateless Session Bean ,
   3.2   Statefull Session Bean,
   3.3   Binding and looking up objects ,
   3.4   Singleton Beans,
   3.5   Local and Remote Lookups,
   3.6   Timers and Schedulers,
   3.7   **Asynchronous EJB Methods**

4 **JAVA MESSAGING SERVICES**
   4.1   JMS Architecture
   4.2   Queue And Topic Messages,
   4.3   Message Driven Beans, JMS Producer and Consumers ,
   4.4   Creating Web Client for MDB

5 JAVA PERSISTANCE

   5.1   Persist objects in Java EE using JPA ,
   5.2   JPA overview,
   5.3   JPA architecture,
   5.4   ORM ,
   5.5   Entity

5.6   PA Annotations,
5.7   One to One ,
5.8   One to Many
5.9   Many to Many Relationships,
5.10   JPA Query Language,
5.11   Named Queries
5.12   Dynamic Queries AND Native Queries,
5.13   Transactions

6 WEB SERVICES
6.1   Introduction, SOAP Basics,
6.2   UDDI,
6.3   WSDL and Schema,
6.4   Creating and Publishing a Web Service,
6.5   Searching and Consuming a Web Service,
6.6   Creating web services for EJBs and Consuming them,
6.7   Securing Web Service Communication
6.8   Introduction to REST services

7   **ENTERPRISE APPLICATION SECURITY**
7.1   The Need of Security ,
7.2   Security Threats,Realm,
7.3   Users, Group and Roles,
7.4   Basic Authentication,
7.5   Techniques,
7.6   Form Based Authenication,
7.7   Protecting Your Resources,
7.8   Java API for Authentcation and Security – JAAS ,
7.9   Maintaining Confidentiality with JAAS,
7.10   Generating Certificates,
7.11   Signing Your Certificate,
7.12   SSL and Certificate Based Authentications,
7.13   Providing Layered Security to Java EE Applications
7.14   Web Service Security Schemes and Implementation

References

1. Mastering Enterprise JavaBeans and the Java 2 Platform, Enterprise Edition, *by Ed Roman*
2.   Java 7 EE Tutorial Basic Concepts by Oracle Corporation
3. Beginning Java™ EE 7 Platform with GlassFish™ 3: From Novice to Professional by Antonio Goncalves
4. Beginning EJB 3 Application Development From Novice to Professional by Raghu R. Kodali and Jonathan Wetherbee with Peter Zadrozny, Apress Publication
5. Pro JPA 2: Mastering the Java™ Persistence API (Expert's Voice in Java Technology) by Mike Keith and Merrick Schincariol, Apress Publication

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT

M.Sc. (I.C.T) Programme (1ˢᵗ Semester)

Paper: 103 / Subject: Software Engineering

Effective From: June, 2014

Credits: 4   **Total Hrs.: 04**

Objective: **To provide insights about software engineering project planning, scheduling, SCM fundamentals and advanced object-oriented software engineering concepts.**

Pre-requisite: **System Analysis and Design, OOP Concepts**

1. Project Management and Software Matrices
   1.1.   Project Management
   1.2.   Software Measurements
   1.3.   Metrics for Software Quality
   1.4.   Cost and Efforts Estimation Model

2. Project Scheduling
   2.1.   Relationship between People & Effort
   2.2.   Defining a Task set for the Software Project
   2.3.   Selecting & Refining Software Engineering Tasks
   2.4.   Scheduling and Tracking Techniques
   2.5.   Earned Value Analysis

3. Risk Management
   3.1.   Software Risk
   3.2.   Risk Identification
   3.3.   Projection
   3.4.   Refinement
   3.5.   RMMM Plan

4. Change Management
   4.1.   Software Configuration Management
   4.2.   SCM Repository
   4.3.   SCM Process

5. Object Oriented Analysis and Design
   5.1.   Object Oriented Paradigm & Concepts
   5.2.   Identifying the elements of an Object Model
   5.3.   Management of Object Oriented Software Projects
   5.4.   Generic Components of the OO Analysis & OOA Process
   5.5.   Object Relationship Model
   5.6.   Object Behavior Model
   5.7.   Generic Components of the OO Design & System Design Process
   5.8.   OOAD using UML

6. Web Engineering
   6.1.   Attributes of web based application
   6.2.   Framework of Web engineering
   6.3.   Analyzing Web-Based system

6.4. Design of Web-Based Application
6.5. Testing of Web Application
6.6. Management Issues

7. Software Design patterns
7.1. Design Principles and Techniques
7.2. Software Architecture
7.3. Architectural Pattern
7.4. Other design patterns

8. Software Quality Assurance
8.1. Software Quality Assurance
8.2. Cost of Quality
8.3. Framework and Standards SQA Framework
8.4. Formal Inspection and technical review
8.5. SQA Plan
8.6. Components of Software Quality Assurance
8.7. Software Quality Assurance Plan
8.8. Quality Standards: ISO 9000 and Companion ISO Standards, CMM, CMMI,
8.9. PCMM, Malcolm Bridge, Three- Sigma, Six- Sigma

References:

1	Software Engineering A practitioner's approach	Roger S Pressman	McGraw Hill
2	Object Oriented Modeling Design	James Rumbaugh, Michael Blaha	PHI
3	An Integrated Approach to Software Engineering	Pankaj Jalote	Narosa Pub.
4	Object-Oriented Software Engineering	Timothy C. Lethbridge, Robert Laganiere	TMH, 2008.
5	Software quality assurance – from theory to implementation	Daniel Galin	Pearson education, 2009.
6	Effective Methods for Software Testing, 2nd Edition	William E. Perry	Second Edition, Wiley
7	Software Engineering- A programming approach	D. Bell, I. Morrey	PHI

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT

M.Sc. (I.C.T) Programme (Semester 1)

Paper: 104 / Subject: Advanced Computer Network

Effective From: June, 2014

Credits: 4   **Total Hrs.: 04**

Objective: **To impart advance knowledge of computer networks and communicating protocols.**

Pre-requisite: **Basic computer network concepts**

1. Introduction to Internet Protocols and Standards
2. Overview of OSI model
3. TCP/IP Model
4. Overview of Physical and Data link layer
5. IP Layer
    5.1.IP : Classful addressing
    5.2.IP : Classless addressing
    5.3.Delivery, Forwarding and Routing
    5.4.ARP and RARP
    5.5.Internet Protocol (IP)
        5.5.1. Datagram
        5.5.2. Fragmentation
        5.5.3. Options
        5.5.4. Checksum
    5.6.ICMP
    5.7.IGMP

6. UDP
    6.1. Process to Process Communication
    6.2. Port Numbers and Socket Address
    6.3. User Datagram
    6.4. Checksum
    6.5. UDP Operations
    6.6. Use of UDP

7. TCP
    7.1   TCP Services
    7.2   TCP Features
    7.3   TCP Segment
        7.3.1. Format
        7.3.2. Encapsulation

8. Application Layer

9. Host Configuration

10. Introduction to Unicast and Multicast Routing Protocols

11. Introduction to Ipv6

Main Readings:

1. TCP/IP Protocol Suit - Behrouz A. Forouzan - TMH
2. TCP/IP Illustrated Volume I - W. Richard Stevens - Pearson Education
3. TCP/IP illustrated - N P Gopalan, B Siva Sadan - PHI

Supplementary Readings:

1. Computer Networks -Tananbaum A. S.- PHI
2. Computer Networks-Protocols, Standards and Interfaces - Black U - PHI
3. Data and Computer Communications - Stallings W. - PHI
4. Introduction to Cisco Router Configuration - Laurra Chappell (Ed) - Techmedia

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT

M.Sc.(I.C.T.) Programme (1ˢᵗ Semester)

Paper: 106 / Subject: Project

Effective From: June, 2014

Credits: 8   **Total Hrs: 8**

- The students are required to develop part time project based on Java Enerprise.

- The students must prepare documentation of the project completed as per the Software Engineering Guidelines.

- At the end of the semester, the students have to submit their project report in bounded form to the institution.

- Project Completion Certificate issued by the institute [M.Sc.(I.C.T.) Programme] is mandatory for appearing in Project Presentation and Viva – Voce.

- The Project Presentation and Viva – Voce will be conducted as per the University exam schedule.

The students have to submit the following reports at the institution:

1. Project Joining Report
2. Project Title Report
3. Progress Report
4. Project Completion Certificate
5. Institution Certificate
6. Non disclosure of Source Code Certificate (In case the student is unable to submit project source code)