VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT

M.Sc.(I.T.) (8th Semester)

Paper: 801 / Subject: Java Web Development

Effective From: June 2014

Credits: 4 **Total Hrs: 4**

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

Prerequisite: **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.T.) (8th Semester)

Paper: 802 / Subject: Enterprise Java

Effective From: June 2014

Credits: 4 **Total Hrs: 4**

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

Prerequisite: **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.T.) (8th Semester)

Paper: 803 / Subject: Smart Device Computing using iOS

Effective From: June, 2014

Credits: 4 **Total Hrs: 4**

Objective:

The objective of the course is to impart knowledge of Objective-C and Apple iOS application design and development.

Prerequisites:

Knowledge of object oriented programming is desirable.

1. Introduction to Smart Devices
- 1.1. Definition
- 1.2. Evolution of Smart Devices
- 1.3. Pervasive Computing
- 1.4. Categories and Features of Smart Devices
- 1.5. Comparison of Devices like mobile phones, PDAs.
- 1.6. Introduction to smart device Operating Systems

2. iOS Introduction
- 2.1. Introduction to iOS
- 2.2. iOS Device types
- 2.3. iOS Architecture
- 2.4. Development tools - Objective-C, Xcode IDE, Interface Builder, Device Simulator

3. Objective-C Objects, Messages and Classes
- 3.1. Introduction to Objective-C
- 3.2. An Instance Reference Is a Pointer
- 3.3. Messages and Methods
- 3.4. Dynamic Typing and Dynamic Binding
- 3.5. Typecasting and the id Type
- 3.6. Messages as Data Type
- 3.7. Class and Superclass
- 3.8. Interface and Implementation
- 3.9. Header File and Implementation File
- 3.10. Class Methods

4. Objective-C Instances
- 4.1. How Instances Are Created
- 4.2. Polymorphism
- 4.3. The Keyword self
- 4.4. The Keyword super
- 4.5. Instance Variables and Accessors
- 4.6. Key–Value Coding

4.7. Declared Properties
4.8. Memory Management – ARC
4.9. Protocols and Categories
4.10. Introduction to Foundation Framework

5. Interfaces Designing

5.1. Views and Window
5.2. Model View Controller (MVC) pattern in User Interface Design - Views, Controls, and Controllers in Cocoa Touch.
5.3. Cocoa Touch, UIKit
5.4. UIView, UIWindow, UIViewControllers,
5.5. UI elements: labels, buttons, text boxes, etc.
5.6. UIImages

6. Event Driven Programming

6.1. UI event loop.
6.2. Outlets, actions, delegates
6.3. data sources in Cocoa Touch Framework

7. Table View

7.1. Static vs. Dynamic Table Views
7.2. Table View Delegate and dataSource
7.3. Table View Styles
7.4. UITableViewController and UITableViewCell Subclasses
7.5. Table View Navigation

8. Touches and Gestures

8.1. Event Handling
8.2. Multi-touch Events
8.3. Recognizing and Handling Gestures:
8.4. pinch, pan, zoom, swipe, and tap
8.5. Custom Gestures

9. Data Persistence

9.1. Maintaining state between application invocations
9.2. File system
9.3. Property Lists
9.4. SQLite
9.5. Core Data Framework
9.6. NSXML Parser

10. Graphics and Multi-media

10.1. Core Graphics
10.2. Custom View and its methods
10.3. Core Media: audio, still photos and video

11. Animation

11.1. Drawing, Animation, and Threading
11.2. UIImageView and UIImage Animation
11.3. View Animation
11.4. Implicit Layer Animation
11.5. Core Animation

11.6. Actions

12. Location based Services

12.1. Core Location Framework
12.2. MapKit and MapView
12.3. Location based Reminder

13. iCloud

13.1. iCloud Requirements
13.2. iCloud Data Storage Services
13.3. Ubiquity Containers
13.4. Core Data and iCloud
13.5. Sharing Data Between Applications

Reference Books:

1. Programming in Objective-C 2.0 by Stephen Kochan, Addison-Wesley publication, 2009
2. iOS 5 Programming Cookbook by Vandad Nahavandippor, O'reilly Publication
3. iPhone and iPad App 24-Hour Trainer by Abhishek Mishra and Gene Backlin, WROX Publication-Wiley-India, 2012
4. Professional iPhone and iPad Database Application Programming by Patrick Alessi, WROX Publication-Wiley-India, 2012
5. iPhone App Development by Craig Hockenberry, SPD O'reilly Publication, 2010
6. Beginning iPhone and iPad Web Apps by Chris Appers and Daniel Paterson, Apress Publicatoin, 2011

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT

M.Sc.(I.T.) (8th Semester)

Paper: 804 / Subject: Information Security and Applications

Effective From: June, 2014

Credits: 4 **Total Hrs: 4**

Objective: To impart fundamental knowledge of issues related to security, basics of cryptography and various algorithms, network security protocols, application layer security, authentication protocols and wireless security. This would help students to understand vulnerability of applications and encourage them to embed security in various applications they develop.

Prerequisite: Basic knowledge of computer networking,

1	Introduction To Security
1.1	Need for security
1.2	Information, Network, Physical Security
1.3	An overview of types of Security attacks and breaches
1.4	Concept of Security services
1.5	Associated Security Mechanisms
1.6	Cryptography and the role of cryptography in data security
1.7	Need for security
2	Classical Cryptography & Shannon's Theory
2.1	The Shift Cipher, Substitution & Transposition techniques
2.2	The Affine Cipher
2.3	The Vignere Cipher
2.4	The Hill Cipher
2.5	Introduction to Stream Ciphers
2.6	Perfect Secrecy
2.7	Theoretical Security & Computational Security
2.8	Motivation for Product Cryptosystems
3	Block ciphers
3.1	Introduction
3.2	Block Cipher Designs : The Substitution Permuatation Networks and Feistel Ciphers
3.3	Block ciphers versus stream ciphers
3.4	Data encryption standard (DES)
3.5	Attacks on DES
3.6	Differential and linear Cryptanalysis
3.7	Advanced encryption standard (AES)
3.8	Attacks on AES
3.9	Block cipher modes of operation
4	Public key cryptography
4.1	Introduction
4.2	Principles of public key cryptosystems
4.3	The RSA algorithm

4.4	Attacks on RSA
4.5	The Rabin Cryptosystem
5	Key management
5.1	Key distribution scenarios
5.2	Key management
5.3	Diffie-Hellman key exchange
6	Message authentication and hash functions
6.1	Authentication requirements
6.2	Authentication functions
6.3	Message authentication codes
6.4	Hash functions
6.5	MD5 message digest algorithm
6.6	Secure Hash algorithm (SHA)
7	Digital signatures and authentication protocols
7.1	Digital signatures
7.2	Authentication protocols
7.3	Digital signature standard
8	User Authentication Protocols
8.1	Remote User Authentication Principles
8.2	Remote User Authentication Using Symmetric Encryption
8.3	Kerberos
9	Network / IP Security
9.1	IP Security Overview
9.2	Security in IPv4 and IPv6, Trade-offs involved
9.3	Encapsulating Security Payload
9.4	Combining Security Associations
9.5	Internet Key Exchange
9.6	Cryptographic Suites
9.7	Firewalls
9.8	Biometrics
10	Transport and Application Level Security
10.1	Web Security Issues
10.2	Secure Sockets Layer (SSL)
10.3	Transport Layer Security (TLS)
10.4	HTTPS
10.5	Secure Shell (SSH)
10.6	E-mail security: PGP, SMIME
10.7	Domain Keys Identified Mail(DKIM)
11	Wireless Network Security
11.1	IEEE 802.12 Wireless LAN Overview
11.2	IEEE 802.12i Wireless LAN Security
11.3	Wireless Application Protocol Overview
11.4	Wireless Transport Layer Security
11.5	WAP End-to-End Security

References:

1	Cryptography and Network Security	B. Forouzan	McGraw-Hill
2	Cryptography and Network Security - Principles and Practice	William Stallings	Prentice Hall
3	Information security: theory and practice	Dhiren R. Patel	PHI

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT

M.Sc. (I.T.) Programme (8th Semester)

Paper: 805 / Subject: Practical

Effective From: June, 2014

Credits: 6 **Total Hrs: 6**

The students are required to carry out practical work during the semester, based upon the theory subjects – 801, 802 and 803.

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT

M.Sc.(I.T.) Programme (8th Semester)

Paper: 806 / Subject: Part Time Project based on Java Enterprise Edition

Effective From: June, 2014

Credits: 8 **Total Hrs: 8**

- The students are required to develop part time project based on Java Enterprise Edition.
- 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.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)