**ADVANCED JAVA Syllabus:**

**Servlets and JSPs**

**1. Basics of a Web application**

What is a web application?

What is a web client and web server?

How do client and server communicate?

HTTP protocol basics

HTML language basics

What is a TCP/IP port, URL?

Need for a Web Container

**2. Web Contaner and Web Application Project Set up**

To set up Tomcat Container on a machine

To set up a Servlets JSP project in Eclipse

To configure dependency of Servlet JSP APIs

Web application project struture

**3. Servlets**

What are Servlets?

What can they do? Why are they needed?

How do Servlets look in code?

HTTP Methods; GET, POST, PUT, DELETE, TRACE, OPTIONS

GET/POST request; differences between the two

Servlet Lifecycle

Servlet Context and Servlet Config

Forwarding and Redirection of requests

**4. Session Management**

What is a session?

Why is it required?

How to get a session?

Session information passing between client and server

Sesssion information passing mechanisms - Cookies, Rewriting

How to destroy a session

**5. JSPs**

Introduction to JSP an dneed for JSPs

Basic HTML tags

JSP Lifecycle

**6. JSP Elements**

Scriptlets

Expressions

Declarations

Significance of above elements and fitment into the JSP Lifecycle

What are Directives in JSP?

Page Directive

Include Driective

Taglib Directive

**7. JSP Tag library**

JSP Standard Actions

Expression Language

JSTL basics and it's usage

Need for Custom Tag Library

Custom Tag Library implementation

**Struts Framework (version 2.x)**

**1. Basics of MVC**

What is MVC?

MVC Type1 and Type2 architecture

Why Struts framework?

Struts 1 overview

Struts 1 and Struts 2 comparison

**2. Struts 2 Architectutre**

Architecture Diagram explanation of following components:

Components of Model, Views and Controller in Struts Framework

Interceptors

Model/Action classes

Value Stack

OGNL

Introduction to configurations; framework and application architecture

Declarative and Annotations configuration approaches

**3. Struts 2 set up and first Action class**

Download JAR files

Struts 2 project build up and Configuration files

To build Action class

To intercept an HTTP request via Struts2 framework using Action class

Defining data and business logic in Action class

Preparing and Forwarding control to Views

**4. Struts 2 Interceptors**

What are Interceptors

Responsibilities of an Interceptor

Mechanism of Interceptor calling in Struts 2

Defining Interceptors

Defining Interceptor stacks

Defining Custom Interceptors

**5. Struts 2 Tag Library**

Introduction to tag library of Struts 2 and it's usage

**6. Struts 2 Validations**

Validations using Validateable interface

Workflow interceptor mechanism for validations

Validations using Validateable interface

Validation Framework introduction and architecture

Validating user input with above two mechanisms

**7. Struts 2 Tiles Frameworks**

Introduction to Tiles in a page

Struts2 Tiles framework introduction

Defining tiles.xml file

Configuring pages for tiles

A complete Tiles example with Struts2

**Hibernate Framework (version 3.x)**

**1. Introduction**

What is ORM principle?

Why ORM?

ORM implementations

**2. Hibernate Architecture**

Introduction to Hibernate

Hibernate Architecture

What are Peristent classes?

**3. Hibernate CRUD**

Setting up Hibernate project

Configuring all JARs and XML files

Setting up connection to DB using Hibernate

Performing basic CRUD operations using Hibernate API

Object Identity; Generator type classes

Using SQL with Hibernate

Using HQL

Using Criteria queries

**4. Mapping Collections and Associations**

To define sets, mas, lists in Hibernate

Association Mappings: 1. One to one

2 One to many

3 Many to one

4 Many to many

**5. Hibernate Caching**

What is caching?

What are the types of caching in Hibernate?

Explanation of various caching mechanisms in Hibernate

**6. Using Hibernate Annotations (if time permits)**

Sample example of using Hibernate Annotations

**Spring Framework (version 3.x)**

**1. Introduction to spring**

What is Spring?

Spring Architecture explanation and all it's components

**2. Introduction to all modules of spring**

Spring Bean Factory

Spring Application Context

Spring DI

Spring AOP

Spring Integration; Spring messaging, Spring JMS

Spring MVC

Spring DAO

**3. Setting up spring**

Setting up of Spring framework

Download JARs

Configure XML files

**4. Dependency Injection**

What is Dependency Injection?

How is it implemented using Spring Framework?

Bean Wiring mechanisms in Spring

**5. Spring AOP**

What is Spring AOP?

Implementation of Spring AOP