***Java Technologies-II (Web Based Java)–PG-DAC February 2020***

# Session 1: J2EE Overview Lecture

* J2EE Container
* Packaging Web applications
* J2EE compliant web application
* Deployment tools.
* Web application life cycle
* Deploying web applications.
* Web Services Support

# Session 2,3,4 Lecture

* Servlets : Dynamic Content Generation
* Advantages of Servlets over CGI
* Servlet Life cycle
* Servlet API & Deployment
* Servlet Annotations
* The Servlet interface
* The HttpServlet, HttpServletRequest, HttpServletResponse
* Exception Handling
* Servlet , DAO , POJO DB Layers
* Session
* Session Management
* Session Tracking with
  + Cookies
  + HttpSession
* Request Dispatcher
* Page Navigation
* Complete Case study Servlet Based

# Assignment – Lab:

Implement exception handling in Servlet.

Use Java Servlets technology in designing and implementing an Air Ticket reservation system. Incorporate Sessions in the Air Ticket reservation system.

# Assignment – Reading:

Know more about the HTTP protocol at [www.w3c.org](http://www.w3c.org/)

# Assignment – Tutorial:

Compare which way of session tracking is better Cookies or HttpSession.

# Session 5:

**Lecture**

* Internationalization and Localization: Basics
* Read and set the locale by using the locale object
* Create and read Properties file
* Build a resource bundle for each locale and load a resource bundle in an application

# Assignment – Lab:

Deploy structured web application.

# Session 6 & 7:

**Lecture**

* JSP: Separating UI from Content generation code
* MVC architecture
* Life cycle of a JSP page
* Directives, Implicit and Explicit Objects, Scriptlets, Expressions, Expression Language
* Scope
* JSP Error Page handling
* Session Tracking
* JSP Using JavaBeans
* Custom Actions and Tag Libraries in JSP

# Assignment – Lab:

Separate UI code from the controller code in your Air Ticket reservation system by incorporating JSP and Servlets. Complete the implementation of Air-ticket reservation system

# Session 8 :

**Lecture**

JavaBeans

* JavaBean Component Model of MVC architecture
* Writing JavaBeans Components
* Properties
* Methods
* Events
* JavaBeans Component Design Conventions
* Creating and Using a JavaBeans Component
* Setting JavaBeans Component Properties
* Retrieving JavaBeans Component Properties
* JSP Using JavaBeans

# Assignment – Lab:

1. Creating a Project by Simple Bean code
2. Implement MVC based web application using servlet, JSP, JavaBeans

# Session 9 & 10 : JNDI , Annotations ,Transaction Management Lecture

* JNDI API
* JNDI Overview
* Java Annotations : Purpose, Basics, Annotation Elements
* Retention Policy
* Built-in Annotations
* Java Custom Annotations
* Using Custom Annotation

# Transaction Management

* Transaction Timeouts **,** Transactions in Web Components
* Transactions and Concurrency
* Transaction Management example

# Assignment – Lab:

Develop Courier Tracking system implementing annotation.

# Session 11:

**Lecture**

* Design Patterns in Java: Overview, Usage, Types of Design Patterns
* Creational: Factory, Singleton, Builder, Prototype
* Structural: Adapter, Composite, Proxy, Facade, Bridge, Decorator
* Behavioral: Template method, Mediator, Chain of Responsibility,Observer,Strategy,Command,State,Visitor
* MVC Pattern, Data Access Object Pattern
* Front Controller Pattern
* Service Locator Pattern
* Transfer Object Pattern

# Assignment – Lab:

Develop candidate examination system implementing above design pattern.

# Session 12 & 13:

**Lecture**

* Apache Maven: Overview, Environment Setup, Ant vs Maven
* POM, Build Life Cycle, Build Profiles
* Maven Repository
* Create, Build and Test Project & Build Automation
* Manage Dependencies, Deployment Automation

# Assignment – Lab:

Configure Apache Maven in web application.

Develop a web application using Apache Maven.

# Session 14 & 15:

**Lecture**

* Hibernate Framework
  + Introduction to Hibernate Framework
  + Architecture
* Hibernate in IDE
  + Creating web application using Hibernate API
  + Life-cycle of Hibernate Entities
* HB with annotation example
* Hibernate Mappings and Relationships
* Collection and Component Mapping
* HQL ,Named Queries , Criteria Queries
* Introduction to Struts 2 Architecture
* Building web pages using Struts 2 , Action Classes & Interceptors

# Assignment – Lab:

Develop a web application (Online Bookshop) using Hibernate Persistence Study Hibernate architecture from [**www.hibernate.org/docs**](http://www.hibernate.org/docs)

# Session 16 :

**Lecture**

* Introduction to JSF 2.0
* Discussion on benefits of JSF
* JSF UI component model
* JSF Architecture
* Life cycle of a JSF
* First application of JSF
* Introduce basic JSF Tags
* Various Navigation methods
* JSF Event Handling

# Assignment – Lab

* Create simple JSF applications for practice.
* Create a test JSF application to test all navigation

# Session 17 & 18 :

**Lecture**

* Overview of Spring4/5 Architecture.
* AOP Overview
* Spring Modules Overview
* Spring MVC architecture
* Understanding Spring 4 annotations
* Spring Application
* Spring in IDE
* Spring in Eclipse
* Dependency Injection

# Assignment Reading

Understand key features of Spring Architecture & design simple Java application to test dependency injection.

# Session 19 & 20:

**Lecture**

* What is IoC(Inversion of Control)
* IOC container
* Dependency Injection
* Spring AOP
* AOP Concepts
* Spring ORM
* Spring MVC
* Model, Model & View , HandlerMapping, ViewResolver, Front Controller
* Deployment of web application using Spring MVC Form with CRUD, File Upload example
* Integration of Spring MVC with Hibernate
* Spring Boot Basics , Overview & Demo

# Assignment – Lab

Design & deploy online stock trading system using spring MVC module Modify earlier assignment to support persistence via Hibernate

# Session 21 & 22:

**Lecture**

**Building REST services with Spring**

* Introduction to web services
* SOAP Vs RESTful web services
* RESTful web service introduction
* Create RESTful web service in java using Spring framework
* RESTful web service JSON example
* RESTful web service CRUD example
* AngularJS and Spring based RESTful web service CRUD Integration

# Assignment – Lab

Design & deploy online stock trading system using spring MVC module Modify earlier assignment to support persistence via Hibernate

Session Added in place of JSF

# Lecture

Spring Boot Essentials

* Why Spring Boot
* Spring Boot Overview
* Building web application with Spring Boot
* Building RESTful web service using Spring Boot
* Overview of Spring Data JPA

# Assignment – Lab

* Design & deploy online stock trading system using spring Boot MVC

# Session 23:

**Lecture**

* Testing in Spring
* Unit Testing of Spring MVC Controllers
* Unit Testing of Spring Service Layer
* Integration Testing of Spring MVC Applications: REST API
* Unit Testing Spring MVC Controllers with REST

# Assignment – Lab

Design & test Spring Application.