## 5Th Semester

# Advanced Java Programming

**MODULE I**

**(10 HOURS)**

An introduction to Network Programming: Basics of Networking, Introduction to Socket Programming, Remote Method Invocation, Java Mail API, A small chatting application using Network Programming

**MODULE II** **(10 HOURS)**

Basics of JDBC: Introduction to JDBC, Need of JDBC, JDBC Drivers (4 types), Architecture of JDBC, Components of JDBC (Classes and Interfaces).

Programming with JDBC: Creating a DATABASE (MS- ACCESS/ORACLE/MySQL (for Type-3 and Type-4 connection), First Program to connect to the DATABASE created, Loading the Driver, Establishing the Connection, Creating Statements (Statement/ Prepared Statement /Callable Statement), Executing a SQL Query, Different types of SQL Queries, Simple Statement, Pre-Compiled Statement, SQL Statements for stored Procedures.

JDBC Program to retrieve data from DATABASE: Introduction to Result Set, Result Set with Statement Interface, Result Set with Prepared Statement Interface, Bidirectional Result Set, Result Set Scroll ability Type, Result Set Updatability Type, Updating data to the Database using Result Set, Result Set Metadata, Executing Stored Procedures Using Callable Statement.

**MODULE III**

**(10 HOURS)**

Introduction to Web Application and its programming: Description about Web application and its Architecture, Client-Server Architecture, An Introduction to HTML5 , Basics of HTTP protocol

Introduction to Servlets: What is Servlet, Strengths of Servlet, Web Servers and its Containers (Tomcat), Role of servlet in Web application development.

Getting Deep to Servlets: Understanding servlet-api, Types of Servlet class, Difference between Http Servlet and Generic Servlet, Life cycle of Servlets and different life cycle methods, Difference between doGet() and doPost(), Servlet Generating Html output, Collecting Client submitted data.

Servlet communications. Servlet to DBMS communication using type-4 connection, Servlet to DBMS communication using JDBC connection pooling, Servlet communication with other

servlets (Servlet Chaining), Servlet communication with HTML page(send Redirect(), Difference between send Redirect() and Request Dispatcher forward()),Understanding Servlet Config.

Additional features to Servlets: Servlet Filters, Session Tracking using HTML hidden form filed element, Cookies, Http Session, URL rewriting, Annotation based servlet programs.

**MODULE IV** **(10 HOURS)**

Java Server Pages: -Introduction to JSP, Scope of JSP, Anatomy of a JSP program, Execution of a JSP program, Significance of JSP Engine, Built in objects of JSP, Significance of JSP Elements, Scripting Elements, Scriptlets, Declaration, Expression language, Directives and Action Elements, Page Directive, Include Directive, Taglib Directive, JSP action Tags: Forward action element, Include, Param, use Bean with introduction to beans, set Property, get Property.

An introduction to JSTL(Core, Formatting only)

Introduction to Distributed Application Development: An Introduction to XML/JSON. Introduction to web services (SOAP/SOA), Rest API.

Modern JAVA Frameworks: Hibernate: Introduction to ORM with Hibernate, Architecture of Hibernate, Hibernate mapping(one-to-one, many-to-one only). Spring: Introduction to Spring,

Dependency Injection, Architecture of Spring framework, Introduction to Spring Core and Spring MVC module only.

**Books:**

[1] Black book, Kogent Learning Solution Inc
[2] Advanced Java Programming, Uttam K. Roy, Oxford University Press.
[3] Java 2: The Complete Reference by Herbert Schildt, Fifth Edition Paperback

***Equivalent NPTEL MOOCs:***

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|---|---|
| Course Name: | Programming In Java |
| Course Link: | https://nptel.ac.in/courses/106/105/106105191/ |
| Course Instructor: | Prof. Debasis Samanta |