

VERSION

25

PROFESSIONAL

SR. CODE

EAPL/PROF/PRTC02

COURSE CODE

EAPAJ

SUB CATEGORY

PROGRAMMING DEVELOPMENT



TOTAL DURATION
90
HOURS



THEORY TAKEN
26
HOURS



PRACTICAL TAKEN
64
HOURS

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CORE &
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PROGRAMMER

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COURSE DESCRIPTION



Java is platform independent language and **Object Oriented Programming language**. Using advanced Java programming language features we can learn **GUI programming (Swing) and Remote Method Invocation (RMI)**. Next how to design dynamic web applications using **Java Server Pages and Java Servlet** and how to connect to data base drivers. Advanced java course consist **JDBC, HTML, Servlet, JSP and JSTL**. Using **JDBC** concept you can learn database concepts in depth and perform all **CRUD** operations easily. Using **HTML** you can develop static web pages. Using **Servlet and JSP** you can develop dynamic web pages.

COURSE GOALS



- ◆ To become familiar with the advanced features of Java Language.
- ◆ To develop Web Applications using Servlets / JSP and deploy in popular servers like Tomcat.
- ◆ To understand Java Servlets and their life cycle.
- ◆ To understand Java Web application directory structure.
- ◆ To develop Server side components in a Java Web application.
- ◆ To understand Java server Pages (JSP) technology.

FUTURE SCOPE



- ◆ To develop JSP Custom tags and use them in JSP pages.
- ◆ Writing Event Listeners in Java Web application.
- ◆ Handling File uploads in Java Web application.
- ◆ To discover how to write Java applications this can communicate with Relational Databases.

01

CHAPTER

BASICS OF JAVA

- O1. Basics: Internal path setting
- O2. Environment Setup:
 - a. ·Download Links
 - b. Method and Installation of Java on Windows



01
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01
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02

CHAPTER

DECLARATION OF JAVA

- O1. Data Types
- O2. Variables, Constraints, and Literals
 - a. Variable declaration
 - b. Initialization of Variable
 - c. Naming convention
 - d. Types of variables
 - e. Memory allocation of variables
- O3. Operators



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02
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03

CHAPTER

CONTROL STATEMENTS

- O1. Decision-Making Statements
 - a. IF-ELSE
 - b. Switch



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O2. Looping Statements

- a. For loop
- b. While loop
- c. Do-while loop

O3. Jumping Statements

- a. Break
- b. Continue

04

CHAPTER

METHODS

- O1. Methods in Java
- O2. Use of method
- O3. Method declaration
- O4. Method signature
- O5. Types of methods
- O6. Calling of method
- O7. Java main method
- O8. Return type



30
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05

CHAPTER

OOPS & CONCEPTS

- O1. Class
- O2. Objects
- O3. Constructor
 - a. Types of Constructor



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b·Constructor Overloading

c· Copy Constructor

O4. Encapsulation

a·Definition

b·Data Hiding

c· Getter and setter method

d·The Naming convention for the Getter and Setter methods

O5. Inheritance

a·Definition

b·Is-A-Relationship

c· Types of Inheritance

d·Aggregation and Composition

O6. Polymorphism

a· Definition

b·Types of polymorphism

c· Method Overloading

d·Method overriding

O7. Super and this Keyword

a. Definition

b·Super class Methods and Constructor

O8. Abstraction

a. Abstract class

b·Abstract method

O9. Interface

a. Nested interface, rules, and example programs

06

CHAPTER

CHAPTER 06

O1. Keywords & Modifiers

- a. Access modifier and a non-access modifier
- b. Types of access modifiers
- c. Types of non-access modifiers

O2. Static Keyword

- a. Static variable
- b. Static methods
- c. The distinctions between a static variable and an instance variable

O3. Final Keyword

- a. Final variable
- b. Final methods
- c. Final class

O4. Inner Class

- a. Definition
- b. Types

O5. This Keyword



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07

CHAPTER

EXCEPTION HANDLING

O1. Explanation

O2. Try, Catch, Finally

O3. Throw, Throws in Exception Handling

O4. Throw vs. Throws

O5. Final vs. Finally vs. Finalize



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CHAPTER

INPUT-OUTPUT STREAM

O1. I/O Stream

- a. Character Stream
- b. Byte Stream

O2. File Class

O3. Serialization



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mins



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09

CHAPTER

ARRAY AND STRINGS

O1. Array

- a. Definition
- b. Types of Array
- c. Array Programs

O2. Sting, String Buffer, String Builder

- a. Definition
- b. Immutable String
- c. String Comparison
- d. String Concentration
- e. Substring
- f. String Buffer Class
- g. Strig Builder Class
- h. to String() method



30
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10

CHAPTER

COLLECTIONS FRAMEWORK

- O1. Definition
- O2. Collections
- O3. List types, set types.
- O4. Comparable and Comparator Interface
- O5. Generic
- O6. Lambda Expressions
 - a. Introduction to Lambda Expression
 - b. Parameters in Lambda Expression
- O7. Date and Time API
 - a. Java time Classes
 - b. Data Formatter
 - c. Calendar and Time Zone



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CHAPTER

THREAD

- O1. Multithreading
- O2. Multithreading life cycle
- O3. Thread scheduler
- O4. Calling method
- O5. Joining a thread
- O6. Naming a thread
- O7. Thread priority
- O8. Daemon thread
- O9. Thread pool



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- 10. Thread Group
- 11. Shutdown hook
- 12. Java Synchronization
- 13. Deadlock
- 14. Inter-thread Communication
- 15. Interrupting Thread

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CHAPTER

CHAPTER 12

- O1. Java Networking
 - a.Socket Programs



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CHAPTER

JDBC

- O1. JDBC Drivers
- O2. Connecting steps to Database
- O3. Oracle Connectivity
- O4. Connectivity with MySQL
- O5. Connectivity with Access without DSN
- O6. Driver Manager
- O7. Types of JDBC statements
- O8. Database Metadata, Resultset Metadata
- O9. ResultSet, types of ResultSet



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- 10. Storing images, Retrieving image
- 11. Storing files, Retrieving files, Stored procedures, and functions
- 12. Transaction Management
- 13. Batch Processing

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CHAPTER

SQL

O1. Data Query Language

- a. What is DQL?
- b. Purpose of DQL
- c. Select

O2. Data Manipulation Language

- a. What is DML?
- b. Purpose of DML
- c. Insert data
- d. Update data
- e. Delete Data
- f. Lock data

O3. Data Control Language

- a. What is DCL?
- b. Purpose of DCL
- c. Grant data
- d. Revoke data

O4. Transaction Control Language

- a. What is TCL?
- b. Purpose of TCL
- c. COMMIT
- d. ROLLBACK
- e. SAVEPOINT

O5. Inserting data

- a. Hands on INSERT data



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- b. SELECT
- c. Hands on SELECT query
- d. Multi inserts
- e. Hands on Multi inserts
- f. NOT NULL
- g. Hands on NOT NULL
- h. DEFAULT Values
- i. Hands on DEFAULT Values
- j. AUTO INCREMENT
- k. Hands on AUTO INCREMENT

O6. Basic Operators

- a. ORDER BY
- b. ALIASES
- c. UNIONS
- d. CONSTRAINTS
- e. VIEWS

O7. Primary Key

- a. What is primary key?
- b. Creating a primary key
- c. Dropping a primary key

O8. Foreign key

- a. What is foreign key?
- b. Creating a foreign key
- c. Dropping a foreign key

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CHAPTER

APPLET

01. Applet

- a. Applet Introduction
- b. Limitation of AWT
- c. Applet Architecture
- d. HTML Applet Tag
- e. Applet Parameters
- f. Different Shapes using Applet
- g. Smiley face using Applet
- h. DocumentBase() and getCodebase()
- i. Checkbox in Applet
- j. Button in Applet


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CHAPTER

SWING / EVENT HANDLING

01. Swing

- a. Introducing a Swing
- b. Creating a Frame
- c. Display Information in a Component
- d. Working with 2D Shapes
- e. Using Color and Special Font for Text
- f. Display Images

02. Event Handling

- a. Components Event Handling Basics
- b. Event Classes
- c. Event Listeners and Adapter Classes
- d. Swing and the MVC Design Pattern
- e. Layout Management
- f. Basic Swing


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CHAPTER

DATABASE & DATABASE CONNECTIVITY

O1. Database

- a. MySQL Introduction
- b. MySQL Create DB
- c. MySQL Drop DB
- d. Alter Table
- e. Truncate Table
- f. Drop Table
- g. Insert and Update Record
- h. MySQL is Null and Not Null

O2. JDBC

- a. The Introduction of JDBC
- b. Architecture of JDBC
- c. JDBC Driver Types and Typical Uses of JDBC
- d. The Structured Query Language
- e. JDBC Configuration
- f. Working with JDBC Statements
- g. Prepared Statements
- h. Query Execution
- i. Scrollable and Updatable Result Sets
- j. Row Sets



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CHAPTER

MULTI THREADING

O1. Multi-threading

- a. What is Single Thread?
- b. What is Multithreading in Java?
- c. Thread Life Cycle in Java
- d. Java Thread Synchronization



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e. Java Multithreading Example

O2. Garbage Collection

- a. Garbage Collection Introduction
- b. Advantages of garbage collection
- c. Types of garbage collector
- d. Garbage collection Procedure
- e. Java API

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CHAPTER

ALGORITHMS

- a. Quick sort
- b. Insertion sort
- c. Merge sort
- d. Selection sort
- e. Bubble sort
- f. Recursion
- g. Linear Search
- h. Advance Encryption Standard
- i. Greedy Algorithm
- j. Jump Search



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CHAPTER

HTML AND XML

O1. HTML

- a. HTML Introduction
- b. HTML Basics
- c. Structural HTML Tag
- d. Specifying Color in HTML
- e. HTML Tables



- f. HTML Forms
- g. Adding images and other page elements
- h. Server side includes

O2. XML

- a. XML Introduction
- b. Features and Advantages of XML
- c. HTML vs XML
- d. XML Attributes
- e. What is XML DOM
- f. Using DOM in java
- g. StaX in Java
- h. Programming in StaX

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CHAPTER

SERVLETS

O1. Introduction

- a. Servlet
- b. The Life Cycle of a Servlet
- c. A Simple Servlet
- d. The Servlet API
- e. The javax.servlet Package
- f. Reading Servlet Parameters
- g. The javax.servlet.http Package
- h. Handling HTTP Requests and Responses

O2. Session Tracking

- a. Cookies in Servlet
- b. Cookies : Login & Logout
- c. URL Rewriting
- d. Http Session



e. Session : Login & Logout

O3. Servlet Filter

- a. Filter
- b. Authentication Filter
- c. Filter Config

O4. Servlet Collaboration

- a. RequestDispatcher
- b. Send Redirect

O5. Servlet with Database

- a. Understanding UDBC
- b. Understanding UNDI
- c. Connect database using JDBC & JNDI

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CHAPTER

JSP

O1. Introduction

- a. Introduction to JSP
- b. Life Cycle of JSP
- c. Creating a simple JSP page
- d. comparing JSP with Servlet
- e. The JSP API
- f. Java Web Frameworks
- g. javax.servlet.jsp


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O2. Implicit Objects

- a. Request
- b. Response
- c. Config
- d. Session
- e. Page Context
- f. Exception
- g. Out
- h. application
- i. Pase
- j. JSP Action Tags

O3. JavaBeans

- a. What Is a Java Bean?
- b. Advantages of Java Beans
- c. Introspection; Properties
- d. Events, and Methods Design Patterns
- e. Using BeanInfo Interface
- f. Bound and Constrained Properties
- g. Persistence; Customizers
- h. the Java Beans API
- i. Writing JavaBeans

O4. JSP Expression Language

- a. JSP with JSTL
- b. JSP Custom Tags

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CHAPTER

HIBERNATE

O1. Introduction to Hibernate

- a. Drawbacks of direct JDBC
- b. Plain Old Java Object (POJO)
- c. What is O-R Mapping
- d. Simple Database Application

O2. Hibernate Configuration

- a. Required JAR Files
- b. Hibernate configuration File
- c. Hibernate properties File
- d. Hibernate xml File
- e. SQL Dialects

O3. Hibernate Concepts

- a. Id and Primary Key
- b. Id Generation Methods
- c. Session Factory
- d. Session
- e. Transaction
- f. Developing CRUD Application

O4. Hibernate O-R Mapping

- a. Mapping Declarations
- b. Modeling Composition with
- c. Relationship
- d. Modeling Composition with Components
- e. One- to-One Association
- f. One-to-Many Association


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- g. Many-to-Many Association
- h. Uni and Bidirectional Associations
- i. Hibernate Value Types
- j. Custom Types

O5. Manipulating and Querying

- a. Persistent Objects
- b. Object Loading
- c. Executing Queries
- d. Iterating Results
- e. Scalar Results
- f. Bind Parameters Pagination

O6. Hibernate Query Language

- a. Select clause
- b. From clause
- c. Where clause
- d. Aggregate functions
- e. Expressions
- f. Sorting
- g. Grouping
- h. Sub queries

O7. Criteria Queries

- a. Creating Criteria
- b. Narrowing the Result
- c. Ordering the Result
- d. 8: Native SQL
- e. Using SQL Query

- f. Named SQL Query
- g. Using Stored Procedure for Querying
- h. Creating Custom SQL for CRUD

O8. Transaction and Concurrency

- a. Session and Transaction Scopes
- b. Database Transaction Demarcation
- c. Optimistic Concurrency Control
- d. Pessimistic Concurrency Control

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