CSE406:ADVANCED JAVA PROGRAMMING

L:3 T:0 P:2 Credits:4

Course Outcomes: Through this course students should be able to

CO1 :: describe applications that use builder pattern and the map-reduce framework

CO2 :: explain high-performing multi-threaded applications

CO3 :: develop Java applications with the latest JDK Technology and GUI features

CO4 :: connect the applications with Database using JDBC

CO5 :: predict the use of Date Time API classes and methods in Java Applications

CO6 :: use Lambda Expression Concurrency features

Unit I

Collections Streams, and Filters : Describing the Builder pattern, Iterating through a collection using lambda syntax, Describing the Stream interface, Filtering a collection using lambda expressions, Chaining multiple methods together, Defining pipelines in terms of lambdas and collections, Describing how to make a stream pipeline execute in parallel, Defining reduction, Calculating a value using reduce, Describing the process for decomposing and then merging work

Lambda Operations : Extracting data from an object using map, Describing the types of stream operations, Describing the Optional class, Describing lazy processing, Sorting a stream, Saving results to a collection using the collect method, Grouping and partition data using the Collectors class, Program to implement Lambda operations

Unit II

GUI : Introduction to swing, JFrame & JPanel, Swing components, Layout managers, Color Class, Font Class, Graphics class, Programs to create Graphical User Interface

Event Handling : Event delegation model, Event and Event source, Event listener interfaces, Registrations and handling events, Event class – mouse events, key events, Anonymous class listeners, Listener Interface Adapter

Unit III

File I/O (NIO.2) : Using the Path interface to operate on file and directory paths, Using the Files class to check, delete, copy, or move a file or directory, Using Stream API with NIO2

Database Applications with JDBC : Defining the layout of the JDBC API, Connecting to a database by using a JDBC driver, Submitting queries and get results from the database, Specifying JDBC driver information externally, Performing CRUD operations using the JDBC API

Unit IV

JSP : Lifecycle of a JSP Page, The Directory structure of JSP, The JSP API, JSP Scripting elements: scriptlet tag, expression tag, declaration tag, JSP Implicit Objects, JSP Action Tags

Unit V

Java Date/Time API : Creating and manage date-based events, Creating and manage time-based events, Combining date and time into a single object, Working with dates and times across time zones, Defining and create timestamps, periods and durations, Applying formatting to local and zoned dates and times

Unit VI

Concurrency : Describing operating system task scheduling, Creating worker threads using Runnable and Callable, Using an ExecutorService to concurrently execute tasks, RecursiveTask

Localization : Describing the advantages of localizing an application, Read and set the locale by using the Locale object, Building a resource bundle for each locale, Calling a resource bundle from an application

Multi-Threading : Overview of multi threading, Thread life cycle, Creating tasks and threads, Thread class and Runnable interface

List of Practicals / Experiments:

Concurrency Practical

- Program to implement Executor service and Fork-Join Framework

Multi-Threading Practical

- Program to implement multi-threading

Localization Practical

- Program to implement Internationalization

Java Date/Time Practical

- Program to implement Date-Time API

JSP Practical

- Program to implement JSP API
- Program to create web-services

File Input output Practical

- Program to implement File I/O

Database Practical

- Program to implement JDBC API

Event Handling Practical

- Program to handle events using listener interfaces
- Program to handle events using Adapter classes

GUI Practical

- Programs to create Graphical User Interface

Lambda Practical

- Program to implement Lambda operations

Collection Practical

- Program to implement Streams API
- Program to implement Collection Streams

Text Books:

1. JAVA THE COMPLETE REFERENCE by HERBERTZ SCHILDT, MCGRAW HILL EDUCATION

References:

1. INTRODUCTION TO JAVA: COMPREHENSIVE EDITION by DR. Y. DANIEL LIANG, PEARSON

2. ADVANCED JAVA TECHNOLOGY by PROF. M.T. SAVALIYA, DREAMTECH PRESS

3. JAVA: THE COMPLETE REFERENCE by HERBERT SCHILDT, Tata McGraw Hill, India

4. CORE JAVA AN INTEGRATED APPROCH by DR. R NAGESWARA RAO, DREAMTECH PRESS

5. PROGRAMMING IN JAVA by SACHIN MALHOTRA AND SAURABH CHOUDHARY, Oxford Higher Education