	Object Oriented Programming	L	T	P	C
Version 1.0		3	0	0	3
Pre-requisites/Exposure	• Basic Knowledge of programming				
Co-requisites	--				

Course Objectives

The objectives of this course are to:

1. Develop Java programs that leverage the object-oriented features.
2. Design & implement multithreading and data structure.
3. Learn the concepts of JDBC and Servlets.

Course Outcomes

On completion of this course, the students will be able to

CO1. Describe Object Oriented Programming and architecture of Java.
CO2. Analyse real world object-oriented concepts and incorporate into the Java programming language.
CO3. Implement Interfaces , Design patterns , Exception , Handling
CO4. Use Multithreading, collections, and JDBC.
CO5. Develop server side applications using JSP and Servlets.

Catalog Description

This course introduces JAVA programming language with object-oriented programming principles. It moves on to introduce the object-oriented programming paradigm, focusing on the definition and use of classes along with the fundamentals of object-oriented design. Further, emphasis is placed on event-driven programming methods, including creating and manipulating objects, classes, and using object-oriented tools such as the class debugger. The concept of design patterns is presented to develop interactive applications. The course sums up with the introduction to the fundamentals of advance JAVA concepts including Servlets, JSP etc.

Course Content

Unit 1: Introduction [4 Lectures]

Feature of Java, JVM, JRE, class path, classes, fields, access control, objects creation, initialization, methods, this, overloading methods, main method, native methods, class design, lexical elements, types and literals, variables, array variables, naming, operators, expressions, member access, precedence, associativity, statements & blocks, if-else, switch, while and do-while, for, labels, break, continue, return, goto.

Unit 2: Inheritance, Interfaces and Packages [7 Lectures]

Extended class, constructors in extended classes, inheriting and redefining members, type compatibility, conversion, protected, final methods and classes, abstract methods and classes, Object class, cloning objects, designing extended classes, single inheritance versus multiple inheritance. Interface, interface declarations, extending interfaces, working with interfaces, marker interfaces, when to use interfaces. Package naming, type imports, package access, package contents, package objects and specifications.

Unit 3: Exception and String Handling [5 Lectures]

Creating exception types, throw, throws, try, catch, finally, custom exception, when to use exception, Wrapper classes, loading classes. String operations, String comparisons, utility methods, making related strings, String conversions, Strings and char arrays, String and byte arrays, String Buffer, String Builder.

Unit 4: Nested Classes and Threads [6 Lectures]

Static nested types, inner classes, local inner classes, anonymous inner classes, inheriting nested types, nesting in interfaces, implementation of nested types. Creating threads, using runnable, synchronization, wait, notify, notifyall, waiting and notification, thread scheduling, deadlocks, ending thread execution, thread management, security, and threadgroup, threads and exceptions, debugging threads.

Unit 5: Collections and JDBC [6 Lectures]

Collections, iteration, Collection interface, set, sortedset, list, map, sortedmap, wrapped collections and collections class, arrays, legacy collection, properties. JDBC: types of drivers, characteristic, components, database connectivity, Statement, Prepared Statement, CallableStatement, Resultset.

Unit 6: Advanced Java [8 Lectures]

Servlets: Introduction, Benefits, Architecture, GET, POST methods, Servlet container, Servlet's Life Cycle, ServletConfig, ServletContext, Requests & Responses, GenericServlet, Thread-Safe Servlets, HttpServlet Class, HttpServletRequest, HttpServletResponse interface, Deployment Descriptor; Session Management: URL Rewriting, Hidden Fields, Cookies, Session Objects, Servlet Filter, Servlet Listeners. JSP: Introduction, problem with servlets, how JSP work, implicit objects, directives, scripting elements, comments, JSP life cycle Attributes: Application, request, session, page; web application deployment, Security.

Text Books

T1: The Java Programming Language 3rd Edition, Ken Arnold, James Gosling, Pearson.
T2: Head First Servlets and JSP 2nd Edition.
T3: The Complete Reference Java 7th Edition, Herbert-Schild, TMH.
T4: Java SE7 Programmer I &II Study Guide, Kathy Sierra and Bert Bates, McGraw Hill.

Reference Books

R1: A premier guide to SCJP 3rd Edition, Khalid Mughal, Pearson.
R2: Thinking in Java, 3rd Edition, Bruce Ackel, Pearson.

Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination

Examination Scheme:

Components	MSE	Presentation/Assignment/ etc	ESE
Weightage (%)	20%	30%	50%

Relationship between the Course Outcomes (COs), Program Outcomes (POs) and Program Specific Objectives (PSOs)

Course Outcomes	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO1	1	2	2		2								1	3	
CO2	1	2	2	2	2								1	3	
CO3	1	2	2	1	2								1	3	
CO4	1	2	2		2								1	3	
CO5	1	2	2		2								1	3	
Average	1	2	2	1.5	2								1	3	

1= Weak 2=Moderate 3= Strong