Course code	Course Name	Course Category	L-T-P	Credits
20CS1201	**Object Oriented Programming through JAVA**	**PCC**	**3-1-0**	**4**

Course Learning Objectives:

1. Gain knowledge about basic Java language syntax and semantics to write Java programs and use concepts such as variables, conditional and iterative execution methods etc.,
2. Understanding the fundamentals of object-oriented programming in Java, including defining classes, objects, invoking methods etc. and exception handling mechanisms.
3. Understand the principles of inheritance, packages and interfaces.
4. Understand the principles of Multithreading and Event handling mechanisms.

Course Content:

Unit 1: (7.5 Contact hours)

Introduction: Object Oriented Programming, Introduction to java and JVM, Key features, Fundamentals of Objects and Classes, Access Specifiers, data types, dynamic initialization, scope and life time, operators, Conditional Statements, control structures, arrays, type conversion and casting. Constructors, usage of static, access control, this key word, garbage collection, overloading, parameter passing mechanisms, nested classes and inner classes.

Unit II: (7.5 Contact hours)

Strings: Exploring the String class, String buffer class, Command-line arguments. Library: StringTokenizer, Random class, Wrapper classes. Encapsulation: Abstraction. Creating User defined Data Structures: Array of Objects, User defined Linked List.

Unit III: (10 Contact hours)

Inheritance and Interface:Types of Inheritance, usage of super key word, method overriding, final methods and classes, abstract classes, Polymorphism: dynamic method dispatch, Static method dispatch. **Interfaces**: Differences between classes and interfaces, defining an interface, implementing interface, variables in interface and extending interfaces.

Unit IV: (6 Contact hours)

File Handling: Streams, File class, File streams. File Reader, File Writer, Buffered Reader, Buffered Writer, String Tokenizer **Exception Handling:** Concepts of Exception handling, types of exceptions, usage of try, catch, throw, throws and finally keywords, Built-in exceptions, creating own exception sub classes.

Unit V (6 Contact hours)

Packages: Creating a Package, setting CLASSPATH, Access control protection, importing packages.**Multithreading :** Concepts of Multithreading, differences between process and thread, thread life cycle, Thread class, Runnable interface, creating multiple threads, Synchronization, thread priorities, inter thread communication, daemon threads, deadlocks, thread groups.

Unit VI (8Contact hours)

Event Handling: Introduction to Event Handling, AWT Components, windows, Layout Managers, Event handling model of AWT, Adapter classes, Menu, Menu bar. **Swings**: swings introduction, JFrame, JPanel and JComponent, Icons and Labels, text fields, buttons – The JButton class, Check boxes, Radio buttons. Combo boxes, Action Listeners. Introduction to JDBC.

Learning Resources

Text books:

- Herbert Schildt, “The Complete Reference Java”, TMH Publishing Company Ltd, 9th Edition.
- Cay Horstmann, “Big Java”, John Wiley and Sons, 2nd Edition

Reference Books:

- Allen B.Downey,“Think Java; How to Think Like a Computer Scientist”,Paper Back 1stEdition
- David J. Eck, Hobart and William Smith Colleges, “Introduction to Programming Using Java” Published by Paper Back .

3. H.M.Dietel and P.J.Dietel “Java How to Program”, Sixth Edition, Pearson Education/PHI

Web resources:

1. http://www.nptelvideos.com/java/java_video_lectures_tutorials.php
2. https://www.tutorialspoint.com/java/
3. https://www.javatpoint.com/java-tutorial
4. http://mooc.fi/courses/2013/programming-part-1/material.html

5. http://math.hws.edu/javanotes

Course Outcomes: At the end of the course, the student will be able to

CO 1	Explain OOP Principles and Write Basic Java Programs.
CO 2	Defining Classes and Objects. Identify classes, objects, members of a class and relationships among them needed for a specific problem
CO 3	To be able to write Java Programs to demonstrate method overloading and Demonstrate the concepts of polymorphism and inheritance. Discuss method overriding V/s method overloading.
CO 4	Explain the benefits of JAVA's Exceptional handling mechanism compared to other Programming Language
CO 5	To be able to write Java Programs to demonstrate Packages and Threading concepts.
CO 6	Discuss and Demonstrate the AWT Concepts and develop the AWT Applications.

For Theory courses only:

Course Nature		**Theory**		
Assessment Method				
Assessment Tool	Weekly tests	Monthly tests	End Semester Test	Total
Weightage (%)	10%	30%	60%	100%

****