COURSE FILE

For

Object Oriented Programming Using Java (ECSE106L)

Faculty Name : Dr. Mohit Sajwan

Dr. Shashank Sheshar

Dr. Jagendra Singh

Dr. Divya Srivastava

Dr. Deepak Singh

Course Type : Foundation

Semester and Year: 2nd Semester and 1st Year

L-T-P : 3-0-4

Credits : 5

Department : Computer Science Engineering

Course Level : UG

SCHOOL OF ENGINEERING AND APPLIED SCIENCES

Department of Computer Science Engineering

Bennett University
Greater Noida, Uttar Pradesh

ECSE102L: Object Oriented Programming using Java

Course Type:	Foundation

L	T	P	Credits
3	0	4	5

Pre-requisites: NA

Course Learning Outcomes:

CLO1: Implement a given algorithm in Java by using standard programming constructs such as, looping, methods, and packages etc.

. **CLO2:** Explain the output of a given Java program and debug errors in a given program.

CLO3: Write simple programs using the features of object-oriented programming language such as, encapsulation, polymorphism, inheritance, etc.

Module 1 (Contact hours: 12)

Overview of course, Introduction and fundamentals of object-oriented programming, Java program compiling, execution, and debugging. Conditional statement: if and if/else and ternary constructs, switch statement; Looping statements: while, for, and do/while loops, Nested loops, Variable lifetime, scope, and visibility. Object Orientation, encapsulation, Abstraction, etc.; Object creation, Object's Lifecycle (creation, "dereference by reassignment" and garbage collection), Wrapper classes, Java operators; String operations; Declare, instantiate, initializing and use a one-dimensional array, multi-dimensional array, ArrayList.

Module 2 (Contact hours: 12)

Create methods with arguments and return values, Apply the static keyword to methods and fields, Create and overload constructors; including impact on default, constructors; Apply access modifiers, encapsulation principles in class; Constructor, destructor, inheritance, and its benefits; Develop code that demonstrates the use of polymorphism, use super and this to access objects and constructors, use abstract classes and interfaces.

Module 3 (Contact hours: 9)

Threads: Multithreading, Exception handling, differentiate among checked exceptions, unchecked exceptions, and Errors, create a try-catch block and determine how exceptions alter normal program flow; Advantages of Exception handling, exception creation, invoking and throwing.

Module 4 (Contact hours: 9)

The Byte Stream: Input stream, output stream, file input stream, file output stream, print stream, Random access file, the character streams, Buffered reader, buffered writer, Applet, Swings: JLabel and ImageIcon, JTextField, JButton, JTabded pan, JScrolpan, Action listener,
JDBC Connection with Database

Lab Experiments

Students will be using IDE Eclipse/Codezinger to gain hands-on experience and programs will be based on scenario using core JAVA.

Suggested Textbooks:

1) Herbert Schildt, Java: The Complete Reference (9th Edition), *McGraw Hill Education*, 2014. ISBN-13 - 978-9339212094.
2) E Balagurusamy, Programming with Java (5th Edition), *McGraw Hill Education*, 2014. ISBN-13 - 978-9351343202.

References:

1) Herbert Schildt, Java: A Beginner's Guide (6th Edition), *McGraw Hill Education*, 2017. ISBN-13 - 978-9339213039.
2) Yashavant Kanetkar, Let Us Java (2nd Edition), *BPB Publications*, 2016. ISBN -13-978-8183334679.

MOOC:

1) Edx-Object Oriented Programming in Java. https://www.edx.org/course/introduction-to-java-programming-starting-to-code
2) Coursera-Object Oriented Programming in Java Specialization. https://www.coursera.org/specializations/object-oriented-programming
3) MIT OpenCourseWare-Introduction to Programming in Java. https://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-092-introduction-to-programming-in-java-january-iap-2010/
4) Udemy-Master Object Oriented Design in Java - Homework + Solutions. https://www.udemy.com/course/mastering-object-oriented-design-in-java/

Evaluation Component:

Components of Course Evaluation	Percentage
Quiz	10
End Term	35
Mid Term	15
Continuous Lab Evaluation	20
Project (Poster and Video)	15
Assignments	5
Total	**100**

Lecture Wise Plan:

Sl. No.	Course Plan
1	Overview of course, Quick revision of python
2	Create executable Java applications with a main method; run a Java program from the command line; including console output, Platform independence
3	Create if and if/else and ternary constructs, Use a switch statement
4	Create and use while loops, for loop, Create and use do/while loops, Nested loops
5	Define the scope of variables, object orientation, encapsulation, Abstraction, etc.
6	Know how to read or write to object fields, Explain an Object's Lifecycle (creation, "dereference by reassignment" and garbage collection)
7	Wrapper classes such as Boolean, Double, and Integer
8	Use Java operators; including parentheses, String operations
9	Declare, instantiate, initialize and use a one-dimensional array,
10	Multi-dimensional array, Linear Searching
11	Binary Searching, Declare and use an ArrayList
12	Create methods without arguments and no return values;
13	Create methods with arguments and return values;
14	Apply the static keyword to methods and fields
15	Create and overload constructors, including impact on default constructors
16	Apply access modifiers, Apply encapsulation principles to a class
17	Constructor, destructor
18	Describe inheritance and its benefits
19	Types of Inheritance
20	Develop code that demonstrates the use of polymorphism;
21	Types of Polymorphism
22	Use super and this to access objects and constructors
23	Abstract classes
24	Interfaces
25	Introduction to Multithreading
27	Start, join, sleep, etc.
28	Garbage Collection
29	Introduction to JVM
30	Differentiate among checked exceptions, unchecked exceptions, and Errors
31	Create a try-catch block and determine how exceptions alter normal program flow
32	Describe the advantages of Exception handling
33	Create and invoke a method that throws an exception
35	The Byte Stream: Input stream, output stream
36	File input stream, file output stream
37	Print stream, Random access file, the character streams,
38	Buffered reader, buffered writer
39	Swing
40	Form designing using Swing
41	JDBC: Objects (Statement, Prepared Statement and Callable Statement)
42	Types of result set Inserting and updating, records

Lab Plan:

Lab No.	Content Planned
1	Introduction to Eclipse and Object-Oriented Programming
2	if/else and ternary constructs
3	Switch Case
4	Loops – While, do-while, for
5	Loops – While, do-while, for, nested for loop
6	Class & Objects - Member Variables and Methods
7	**Lab Exam 1**
8	**Lab Exam 2**
9	To understand the usage and implementation of constructors.
10	String
11	Scope of Class Variable, Member Variable and local variable
12	Encapsulation
13	1-Dimensional Array, Searching, Sorting,
14	Sorting
15	**Lab Exam 3**
16	**Lab Exam 4**
17	Stack
18	Queue
19	Collection Classes
20	Packages
21	Inheritance
22	Polymorphism
23	**Lab Exam 5**
24	**Lab Exam 6**
25	Exception Handling: try-catch
26	Exception Handling: Throw, throws, finally
27	JDBC: Objects (Statement, Prepared Statement and Callable Statement)
28	**Lab Exam 7**