Karunya INSTITUTE OF TECHNOLOGY AND SCIENCES
(Declared as Deemed to be University under Sec.3 of the UGC Act, 1956)
A CHRISTIAN MINORITY RESIDENTIAL INSTITUTION
AICTE Approved & NAAC Accredited
Karunya nagar, Coimbatote-641114

Department of Computer Science and Engineering

Subject Name: Object Oriented Programming **Credits: 3:0:0**
Subject Code: 18CS2014

Course Objectives:
Enable the student to

1. understand the basic concepts of C++ and Java
2. develop high quality, internally documented, well-structured object-oriented program.
3. adapt object-oriented principles such as abstraction and information hiding in software development.

Course Outcomes:
The student will be able to

1. define the object-oriented programming concepts.
2. select the relevant object-oriented concepts to implement a real time application with design patterns.
3. demonstrate the application of polymorphism in various ways.
4. illustrate the use of inheritance, exceptions, generics and collection.
5. develop applications with event-driven graphical user interface and file management.
6. describe software development process.

Module 1: Programming Basic, Decision Making and Functions Using C++
Basic program construction, Data types, Arrays, Operators, Control statements, Simple functions, Passing arguments to functions, Returning values from functions, Reference arguments, Recursion, Inline functions, Scope and storage class.
Module 2: **Introduction to Java Programming, Classes and Objects**
Features of Java, JDK, JRE and JVM, Structure of java program, Class fundamentals, Declaring objects, Constructors, Garbage collection, Overloading methods, Nested and inner classes,
Module 3: Inheritance, Packages and Interfaces
Member access and inheritance, Using super, Method overriding, Dynamic method dispatch, Defining a package, Access protection, Importing packages, Defining an interface and implementing interfaces.
Module 4: Exception Handling, Multithreading and Wrapper Classes
Exception-handling fundamentals, Exception types, Uncaught exceptions, Using try and catch, throw, throws, finally, Built-in exceptions, creating user-defined exceptions, Java thread model, Creating threads, Boxing and unboxing.
Module 5: Input Output Handling, File Handling, Collection and Generics

Input output basics, Reading console input, Writing console output, Reading and writing files, ArrayList, Generic class, Bounded types, Creating a generic method.

Module 6: Design Patterns, Graphical Programming and Software Development Process

Introduction to design patterns, Iterator pattern and model-view-controller pattern, Simple swing application, Event handling, Painting in swing, Swing user interface elements, Software development process.

Text Books:

1. Herbert Schildt, "Java: The Complete Reference", 10th edition, McGraw Hill Education, 2017, ISBN-10: 1259589331.
2. Robert Lafore, "Object Oriented Programming in C++", 4th edition, Tech Media, 2008. ISBN 0-672-32308-7.

Reference Books:

1. Herbert Schildt, "C++: The Complete Reference", 5th edition, Tata McGraw-Hill, 2015. ISBN 978-0071634809.
2. Paul J. Deitel, Harvey M. Deitel, "C++: How to Program", Pearson, 2014, ISBN 780273793298.
3. Harvey M. Dietel, "Java How to Program", 7th edition, Prentice Hall, 2007. ISBN:978-0132222204.
4. Elisabeth Freeman, "Head First Design Patterns", O'Reilly, 1st edition, 2004, ISBN-10: 0596007124.
5. Kathy Sierra, Bert Bates, "Head First Java", 2nd edition, O'Reilly Media, 2005. ISBN: 10- 0596004656, ISBN-13:9780596004651.

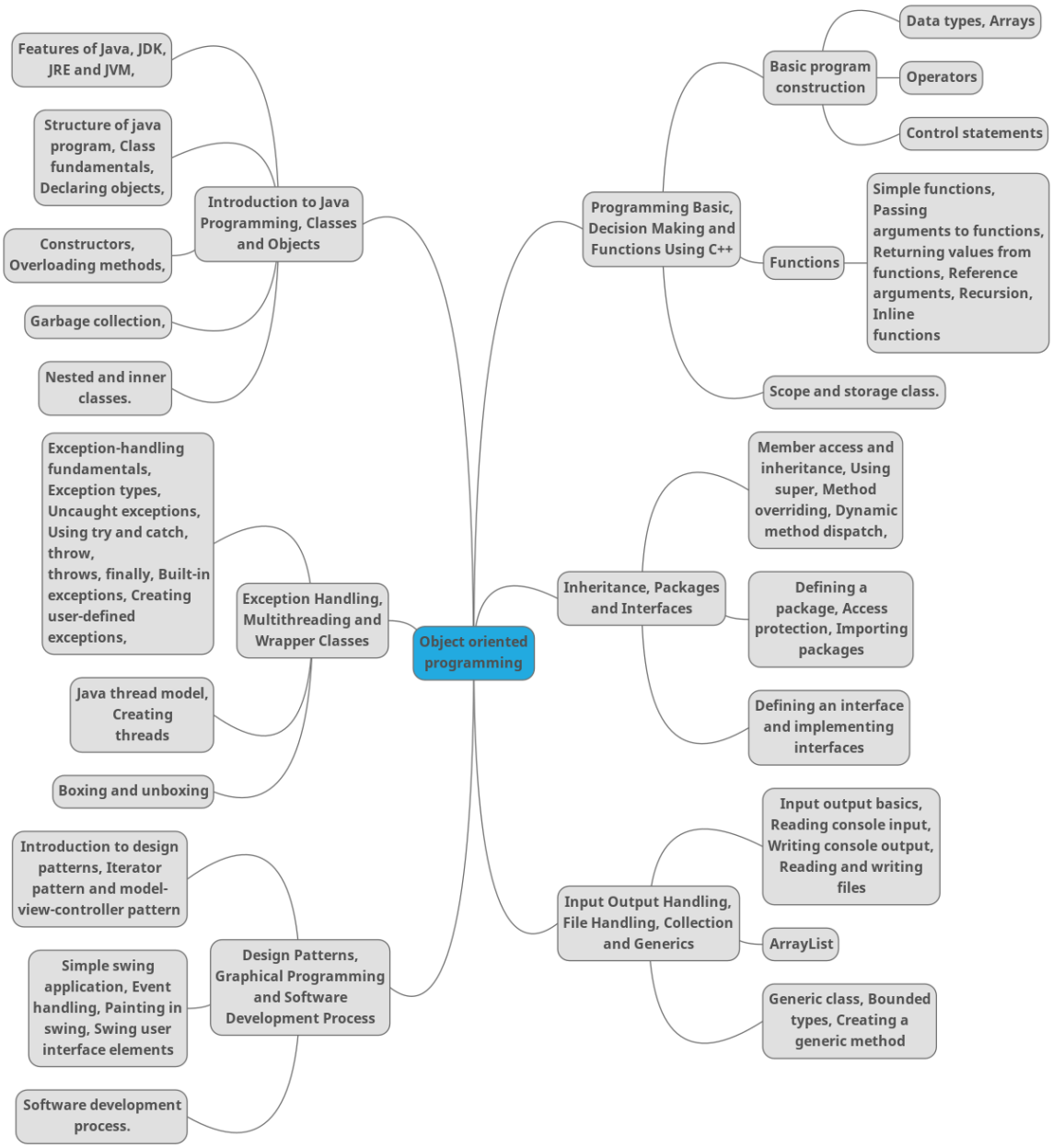
Teaching Plan

Module No.	Lect No.	Topics to be covered	Book & Page Nos. used for teaching	Topic No	Teaching Method
1	1	Basic Program Construction	T2, Pg.No. 30-38	Chapter 2	Chalkboard
	2	Data Types	T2, Pg.No. 38-51	Chapter 2	Chalkboard
	3	Operators	https://www.tutorialspoint.com/cplusplus/cpp_operators.htm		Chalkboard/ Discussion
	4	Control Statement	T2, Pg.No. 78-123	Chapter 3	jigsaw Method
	5	Simple function	T2, Pg.No. 162-167	Chapter 5	Chalkboard / Live Demo
	6	Passing arguments to functions, Returning values from functions	T2, Pg.No. 167-182	Chapter 5	Chalkboard / Live Demo
	7	Reference arguments, Recursion	T2, Pg.No. 182-195	Chapter 5	Chalkboard / Discussion
	8	Inline functions, Scope and storage class	T2, Pg.No. 195-206	Chapter 5	jigsaw Method
	9	Object Oriented Programming Principles	https://www.javatpoint.com/java-oops-concepts		PPT and Demo

2	10	Features of Java, JDK, JRE and JVM, Structure of java program	T1, Pg.No. 10-13, 23-28	Chapter 1	Seminar
	11	Arrays	T1, Pg.No, 53-60	Chapter 3,17	Hands on
	12	Class fundamentals, Declaring objects, Constructors	T1, Pg.No. 109-124	Chapter 6	Chalkboard / Live Demo
	13	Garbage collection	T1, Pg.No. 125-126	Chapter 7	Chalkboard / Live Demo
	14	Overloading methods	T1, Pg.No. 129-134	Chapter 7	Chalkboard / Live Demo
	15	Nested and inner classes	T1, Pg.No. 149-154	Chapter 7	Chalkboard / Live Demo
	16	String Handling Functions	T1, Pg.No. , 439-456		Hands-on
3	17	Member access and inheritance	T1, Pg.No. 161-164	Chapter 8	Video presentation
	18	Using super, Method overriding, Dynamic method dispatch	T1, Pg.No. 167-180	Chapter 8	Chalkboard / Live Demo
	19	Defining a package, Access protection, Importing packages	T1, Pg.No. 187-196	Chapter 9	Chalkboard / Live Demo
	20	Defining an interface and implementing interfaces	T1, Pg.No. 196-200	Chapter 9	Chalkboard / Live Demo
	21	Abstract class			Hands-on
4	22	Exception-handling fundamentals	T1, Pg.No. 213-214	Chapter 10	Chalkboard / Live Demo
	23	Exception types, Uncaught exceptions	T1, Pg.No. 214-216	Chapter 10	Chalkboard / Discussion
	23	Using try and catch, throw, throws, finally	T1, Pg.No. 216-227	Chapter 10	Chalkboard / Live Demo
	25	Built-in exceptions	T1, Pg.No. 216-227	Chapter 10	Chalkboard / Live Demo
	26	Creating user-defined exceptions	T1, Pg.No. 227-231	Chapter 10	Hands-on
	27	Java thread model	T1 Pg.No. 233-237	Chapter 11	Chalkboard / Live Demo
	28	Creating threads	T1, Pg.No. 237-242	Chapter 11	Video presentation
	29	Boxing and unboxing	T1, Pg.No. 274-279	Chapter 11	Hands-on
	30	Lambda Expressions	T1, Pg.No. 379-387	Chapter 15	Chalkboard / Live Demo
5	31	Input output basics	T1, Pg.No. 301-305	Chapter 13	Chalkboard / Live Demo
	32	Reading console input	T1, Pg.No. 305-308	Chapter 13	Chalkboard / Live Demo
	33	Writing console output	T1, Pg.No. 305-308	Chapter 13	Chalkboard / Live Demo

	34	Reading and writing files	T1, Pg.No. 309-315	Chapter 13	Hands-on
	35	ArrayList, Generic class	T1, Pg.No. 511-515, 337-346	Chapter 18	Chalkboard / Live Demo
	36	Bounded types, Creating a generic method	T1, Pg.No. 346-360	Chapter 14	PPT / Discussion
	37	Overview of TreeMap	https://www.javatpoint.com/java-treemap		
6	38	Introduction to design patterns	https://sourcemaking.com/design_patterns		Chalkboard / Live Demo
	39	Iterator pattern	R4, Pg.No. 9-13	Chapter 1	Chalkboard / Live Demo
	40	model-view-controller pattern	R4, Pg.No. 28-36	Chapter 1	Chalkboard / Live Demo
	41	Simple swing Application	T1, Pg.No. 1026-1030	Chapter 31	Chalkboard / Live Demo
	42	Event handling	T1, Pg.No. 1030-1033	Chapter 31	Chalkboard / Live Demo
	43	Painting in swing	T1, Pg.No. 1036-1040	Chapter 31	Chalkboard / Live Demo
	44	Swing user interface elements	T1, Pg.No. 1041-1066	Chapter 32	Hands-on
	45	Software development Process	https://www.tutorialspoint.com/programming_methodologies_training/software_development_process.asp		
	46	Accessing Database using JDBC	https://www.javatpoint.com/java-jdbc		

Concept map of the entire subject:



Course Articulation Matrix

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
CO1	-	-	1	-	-	-	-	-	-	-	-	-	-	3
CO2	2	1	3	2	2	-	-	-	-	-	-	-	2	2

CO3	-	3	1	-	-	-	-	-	-	2	-	-	1	2
CO4	-	3	3	1	2	-	-	-	-	2	-	-	2	1
CO5	-	1	3	2	2	-	-	-	-	-	-	-	1	1
CO6	2	3	3	1	3	-	-	-	-	-	-	-	-	2
Average	1	2	2	1	2	-	-	-	-	1	-	-	1	2

Note: 3 – High correlation; 2 – Medium correlation; 1 – Low correlation;

Assessment Pattern:

Bloom's Category	**Continuous Assessment Tests**			**Qualitative Assessment (QA)**			**End Semester Examination**
	1	2	3	1	2	3	
Remember	20	20	20				20
Understand	50	30	30				30
Apply	30	50	50	10	10	10	50
Analyze	-	-	-				-
Evaluate	-	-	-				-
Create	-	-	-				-

QA 1: Class test

QA 2: Problem Solving in Hackerrank / Codechef

QA 3: Mini project