SRM INSTITUTE OF SCIENCE AND TECHNOLOGY
FACULTY OF ENGINERING AND TECHNOLOGY
SCHOOL OF COMPUTING

COURSE PLAN
21CSC101T OBJECT ORIENTED DESIGN AND PROGRAMMING
JANUARY – MAY 2024

Revision History:

Date	Version	Modification done	Modified by	Reviewed by	Authorized by
08-01-2024	1.0	Initial Release	Dr. A ShobanaDevi	Dr. G. vadivu	

Table of Contents

1.0 General Details

Course Code: 21CSC101T

Course Title: Object Oriented Design and Programming

Semester: II

Course Time: JANUARY – MAY 2024

Slot: A

Day	Batch			
	Batch 1		Batch 2	
	Hour	Timing	Hour	Timing
Day order 1	1,2	8:00am - 9:40am	6,7	12:30pm - 2:15pm
Day order 2	10	4:00pm - 4:50pm	5	11:35am - 12:25pm
Day order 3	3	9:45am - 10:35am	8	2:20pm - 3:10pm
Day order 4	-	-	-	-
Day order 5	-	-	-	-

Location: University Building, Tech Park

Tutorial Assessment Hour: Batch 1: Day order 3 - 3rd Hour & Batch2: Day order 3 - 8th Hour

2.0 Reference Books

1. Grady Booch, Robert A. Maksimchuk, Michael W. Engle, Object-Oriented Analysis and Design with Applications, 3rd ed., Addison-Wesley, May 2007

2. Reema Thareja, Object Oriented Programming with C++, 1st ed., Oxford University Press, 2015

3. Sourav Sahay, Object Oriented Programming with C++, 2nd ed., Oxford University Press, 2017

4. Robert Lafore, Object-Oriented Programming in C++, 4th ed., SAMS Publishing, 2008

5. Ali Bahrami, Object Oriented Systems Development", McGraw Hill, 2004

6. Craig Larmen, Applying UML and Patterns, 3rd ed., Prentice Hall, 2004

3.0 Prerequisites

Understanding of C programming.

4.0 Instructional Objectives

1. Describe the features of object-oriented programming using C++.
2. Understand object-oriented design methodologies for real-time application development.
3. Learn and understand Method overloading and operator overloading.

4. Conceptualize Inheritance and its types.

5. Understand and apply Inline, friend and virtual functions and create application development programs.

6. Understand and apply Templates, Exceptional handling and collections for real-time object-oriented programming applications.

7. Model the System using Unified Modelling approach using different diagrams.

5.0 Overall Assessment Plan

#	Component	Type	Marks
1	Cycle Test - I	Written Test	7.5
		E-Lab completion – 3 marks Programs Lab Test using Code Blocks – 7 marks	10
2	Cycle Test - II	Written Test	12.5
		E-Lab completion – 3 marks Programs Lab Test using Code Blocks – 7 marks	10
3	Hacker Rank	Online Platform	10
4	Quiz/Puzzles/Review Questions	Written/Program using Code Blocks	5
5	Hackathons / Online Certifications	Coding	5
Total Marks			60

6.0 Tentative Test Schedule

#	Tentative date	Test	Marks	Portion	Duration
1	01-03-2024	Cycle Test - I	7.5 10	Unit 1 and 2	100 minutes
2	09-05-2024	Cycle Test - II	12.5 10	Unit 3, 4 and 5	100 minutes

7.0 Detailed Test Plan

Test	Tentative Date	Type	Marks	Mode
Cycle Test - I	01-03-2024	Written Test	Total: 50 Marks Exam Pattern: MCQs - 20 Concept Understanding Questions - 2 Scenario based / HOTs Questions - 2	Physical Exam
	22-02-2024	Programming Test and E-lab Completion	Total: 10 Marks E-Lab completion – 3 marks Programs Lab Test using Code Blocks – 7 marks 3 programs out of 5 + viva	Physical Exam using Code Blocks
Cycle Test - II	09-05-2024	Written Test	Total: 50 Marks Exam Pattern: MCQs - 20 Concept Understanding Questions - 2 Scenario based / HOTs Questions - 2	Physical Exam
	06-04-2024	Programming Test and E-lab Completion	Total: 10 Marks E-Lab completion – 3 marks Programs Lab Test using Code Blocks – 7 marks 3 programs out of 5 + viva	Physical Exam using Code Blocks

8.0 Hacker Rank Split-up Plan

Test	Tentative date of evaluation	Marks	Split-up
Hacker Rank / Leet Code	10-05-2024	Coding - 5 marks Badges - 5 marks Total: 10 marks	Medium / hard questions only No. of Badges / Recognitions Earned (5 Marks) 5 and greater than 5 – 5 Marks 4 Badges – 4 Marks 3 Badges – 3 Marks 2 Badges – 2 Marks 1 Badge – 1 Mark No Badges / Recognitions – 0 Mark No. of Medium and Difficult Questions Solved (5 Marks) More than 20 – 5 Marks 16 to 20 – 4 Marks 11 to 15 – 3 Marks 06 to 10 – 2 Marks 01 to 05 – 1 Mark No Questions Solved – 0 Marks

9.0 Quiz/Puzzles/Review Questions

Total marks – 5. Five activities will be conducted. One for each unit-wise and score will be calculated for 5 marks.

Test	Tentative Date	Portion
Quiz/Puzzles/Review Questions 5 activities will be conducted unit-wise and score will be converted for 5 marks	15-02-2024	Unit 1
	08-03-2024	Unit 2
	23-03-2024	Unit 3
	10-04-2024	Unit 4
	02-05-2024	Unit 5

10.0 Hackathons / Online Certifications

Test	Marks	Tentative Date	Split-up
Hackathons / Online Certifications	5	10-05-2024	Maximum of 2 Hackathons to be Considered. First Prize– 5 Marks Second Prize – 4 Marks Third Prize – 3 Marks Participated – 2 Marks No Competitions participated – 0 Marks

11.0 Detailed Session Plan

#	Topics to be covered	Hours	Ref	Teaching method	Testing method
Unit 1					
1	Introduction to Object-Oriented Programming, Features of C++	1		PPT	Illustration using example
2	I/O Operations, Data Types, Variables-Static, Constants-Pointers	1		PPT	Illustration using example
3	Type Conversions, Conditional and looping statements –	1		PPT	Illustration using example
4	Arrays - C++ 11 features	1		PPT	Illustration using example
5	Class and Objects, Abstraction and Encapsulation	1		PPT	Illustration using example
6	Access Specifiers, Methods	1		PPT	Illustration using example
7	UML Diagrams Introduction – Use Case Diagram, Class Diagrams	1		PPT	Illustration using example
8	Practice questions from elab	1		elab	Programming test
9	Quiz/Puzzles/Review Questions	1		-	Solving examples
Unit 2					
10	Methods and Polymorphism	1		PPT	Group discussion, Illustration using example
11	Constructors- Types of constructors - Static constructor and Copy constructor	1		BB	Group discussion, Illustration using example
12	Destructor - Constructor overloading	1		PPT	Group discussion, Illustration using example
13	Method Overloading	1		PPT	Group discussion, Illustration using example
14	Operator Overloading	1		PPT	Group discussion, Illustration using example
					Group discussion, Illustration using

15	Sequence Diagram	1		PPT	example
16	Collaboration Diagram	1		PPT	Group discussion, Illustration using example
17	Practice questions from elab	1		elab	Programming test
18	Quiz/Puzzles/Review Questions	1		-	Solving examples
Unit 3					
19	Inheritance – Types -Single and Multiple Inheritance	1		PPT	Group discussion, Illustration using example
20	Multilevel Inheritance - Hierarchical Inheritance - Hybrid Inheritance	1		PPT	Group discussion, Illustration using example
21	Inheritance examples	1		BB	Group discussion, Illustration using example
22	Advanced Functions - Inline, Friend- Virtual	1		PPT	Group discussion, Illustration using example
23	Pure Virtual function - Abstract class	1		PPT	Group discussion, Illustration using example
24	Examples of Advanced Functions	1		PPT	Group discussion, Illustration using example
25	UML State Chart Diagram - UML Activity Diagram	1		PPT	Group discussion, Illustration using example
26	Practice questions from elab	1		elab	Programming test
27	Quiz/Puzzles/Review Questions	1		-	Solving examples
Unit 4					
28	Generic Programming - Templates - Function templates	1		PPT	Group discussion, Illustration using example
29	Class Templates - Example programs for Class and Function templates	1		PPT	Group discussion, Illustration using example
30	Exceptional Handling: try and catch	1		PPT	Group discussion, Illustration using example

31	Multilevel exceptional - throw and throws - finally	1		PPT	Group discussion, Illustration using example
32	Example programs for Exceptional Handling	1		BB	Group discussion, Illustration using example
33	User defined exceptional	1		PPT	Group discussion, Illustration using example
34	Package Diagram - UML Component Diagram - UML Deployment Diagram	1		PPT	Group discussion, Illustration using example
35	Practice questions from elab	1		elab	Programming test
36	Quiz/Puzzles/Review Questions	1		-	Solving examples
	Unit 5				
37	STL: Containers: Sequence and Associative Container	1		PPT	Group discussion, Illustration using example
38	Sequence Container: Vector, List, Deque, Array,	1		PPT	Group discussion, Illustration using example
39	STL: Stack	1		PPT	Group discussion, Illustration using example
40	Associative Containers: Map, Multimap	1		PPT	Group discussion, Illustration using example
41	Iterator and Specialized iterator - Functions of iterator	1		PPT	Group discussion, Illustration using example
42	Algorithms: find(), count(), sort()	1		PPT	Group discussion, Illustration using example
43	Algorithms: search(), merge(), for_each(), transform()	1		PPT	Group discussion, Illustration using example
44	Example programs	1		PPT	Solving by example
45	Quiz/Puzzles/Review Questions	1		-	Solving examples

12. Overall Execution Plan:

#	Activity	Target Dates	Responsibilities	Assigned to

1	Video Content Preparation	11-01-2024	Select the list of topics unit-wise to prepare C++/OOPS concepts interview questions and form team and assign topics to team members. Send the list of topics planned to course coordinator/audit professors for review **Guidelines for video preparation:** 1. Each video should cover separate topic and three C++/OOPS concepts interview questions with solution explanation. 2. Duration of video to be from 7 to 10 mins only. 3. Common template to be used by all. 4. Formal Dress code while recording. 5. Video should cover - Introduction about the topic, Overview, Problem explanation, Solution demo using any C++ compiler, conclusion.	All faculties. Team Heads
2	Lab Program Exercises Questions Preparation	11-01-2024	1. Each faculty to prepare Maximum 5 programs for the topic assigned. 2. Questions have to be framed on own and not to be taken as such from any other source. Other sources can be referred, but the question has to be modified, say with different example program, and so on. 3. Solution is required for all the questions. 4. Team Heads are responsible for distributing topics to team members and no topics are missed.	All faculties. Team Heads
3	Question Bank Preparation	13-02-2024	1. Each faculty to prepare for the respective units assigned. 2. Questions have to be framed on own and not to be taken as such from any other source. Other sources can be referred, but the question has to be modified, say with different example program, and so on. 3. Solution is required for all questions. Multiple Choice Questions - 5 Concept Understanding Questions - 2 Scenario based / HOTs Questions - 1 4. Team Heads are responsible for distributing topics to team members and no topics are missed.	All faculties. Team Heads
4	Question Bank Scrutiny	20-02-2024 15-03-2024 21-04-2024	1. Check for the quality of the questions as per the category in the question bank. 2. Ensure there are no repetitions. 3. Coordinate with CC.	SPOC Team
5	Cycle Test	28-02-2024 13-04-2024 08-05-2024	1. Select the question from Question Bank 2. Share the QP to audit professor for review 3. Plan for cycle tests question paper printing, print and distribute. 4. Coordinate with CC.	SPOC Team

6	Course File Preparation	13-03-2024 25-04-2024 15-05-2024 26-05-2024	1. Responsible for the preparation of course file as per the checklist. 2. At the end of each CT exam, files should be updated and got verified from the Team Head. 3. Participate in result analysis activity. 4. Course Files are to be prepared for each department and the faculties listed are responsible for the preparation including CO-PO Mapping, attainment of Cos, etc. 5. Coordinate with CC.	SPoCs Course File Team
7	Review questions	14-02-2024 07-03-2024 21-03-2024 07-04-2024 01-05-2024	1. Team head of each Unit along with team to Prepare questions for quiz/puzzle/review for each unit with solution. 2. Share to CC for review. 3. Share the reviewed questions to all faculties.	Team Heads
8	Feedback Collection and Minutes of Meeting	17-02-2024 17-03-2024 14-04-2024 18-05-2024 30/05/2024	1. Scribe and prepare minutes of meeting for all meetings conducted. 2. Share the MoM to CC and Audit professors on the same day or the next of meeting.	Team