Semester Lecture Plan								
Name of the college: Government College of Arts, Science and Commerce, Sanquelim - Goa								
Name of Faculty: Shubham Naik					**Subject: Computer Science**		**Division:**	
Paper code: CSC 203 Object oriented technologies					**Program/Course: S.Y.Bsc. Total Lectures: 45**			
Academic year: 2024- 2025					**Semester: IV**			

Course Objectives:

This course is intended to:

1. This course introduces students to the principles and practices of object-oriented technology in software development.
2. Students will learn the fundamentals of object-oriented programming, design principles, and patterns.
3. Practical implementation using a programming language, such as Java or C++, is an integral part of the course.

Course Outcomes

Students will,

1. Define and recall fundamental Object-Oriented (OO) concepts, including classes, objects, encapsulation, and inheritance.
2. Understand object-oriented principles.Analyze given problem, breakdown into logical units and solve using bottom-up approach.
3. Develop simple Object-Oriented programs using a chosen programming language to implement basic concepts like classes, objects, inheritance and polymorphism in practical programming

Student learning outcomes
To understant the basics of Object oriented programming
To understant the basics of OOPs concepts
To understant the basics of Object oriented features
To understant the basics of Object oriented design using UML

Month	Lectures		No. of lectures allotted	Topic, Subtopic to be covered	Experiment/Assignment	ICT Tools	Reference books
	From:	To:					
Dec	09-12-2024	14-12-2024	3	Unit-1: Introduction to Object Oriented Programming and Basic OO concepts ● Overview of programming paradigms ● Evolution and principles of object-oriented programming	Assignment	Powerpoint presentation	1. Timothy Budd, "An Introduction to Object Oriented Programming", Pearson Edition, 3rd Edition. 2. Bjarne Stroustroup "The C++ programming Language" Addison Wesley.
	16-12-2024	21-12-2024	3	● Comparison with procedural programming ● Introduction to key OOP concepts:	Assignment		
JAN	02-01-2025	04-01-2025	3	● Classes – attributes and methods; Encapsulation; class as a module and class as a type; uniform type system, static and non-static members	Assignment		
	06-01-2025	11-01-2025	3	● Objects – object creation; constructors and destructors; object references, object copying and cloning, object composition	Assignment		
	13-01-2025	18-01-2025	3	● Inheritance – types of inheritance, deferred features and classes, edeclaration, dynamic method dispatch	Assignment		

	20-01-2025	25-01-2025	3	● Polymorphism – overloading and overriding	Assignment		
	27-01-2025	01-02-2025	3	Unit-2: Object Oriented Features ● Memory management – reclaiming memory, automatic memory management, garbage collection methods ● Interfaces	Assignment		
FEB	03-02-2025	08-02-2025	3	● Access specifiers/modifiers ● Exception Handling – basic concepts, exception handling mechanism, handling multiple exceptions, rethrowing, throws, user defined exceptions	Assignment		
	10-02-2025	15-02-2025	3	● Collection Framework – use of collection framework	Assignment		
	17-02-2025	22-02-2025	3	● Generics/Templates – horizontal and vertical type generalization, need for type parameterization, generic classes and methods	Assignment		
	24-02-2025	01-03-2025	3	Unit-3: OOAD using UML, Design Patterns and Advanced Features of OOP ● OOAD using UML ● OOAD - Understanding the software development life cycle; Object-oriented analysis: identifying objects, classes, and relationships; Object-oriented design principles and patterns	Assignment		
MAR	03-03-2025	08-03-2025	3	● Introduction to UML Diagrams (class diagram, use case diagram, sequence diagrams)	Assignment		

	10-03-2025	15-03-2025	3	● Design Patterns	Assignment		
	17-03-2025	22-03-2025	3	● Introduction to design patterns and their significance; Common design patterns (Singleton, Factory, Observer, etc.); Implementing design patterns in code	Assignment		
	24-03-2025	29-03-2025	3	● Advanced features	Assignment		
APR	31-03-2025	05-04-2025	3	● Persistence and serialization	Assignment		
	07-04-2025	11-04-2025	3	● Concurrency/threads	Assignment		

Month	**Practicals**		**No. of practicals allotted**	**Topic, Subtopic to be covered**	**Experiment/Assignment**	**ICT Tools**	**Reference books**
	From:	**To:**					
Dec	09-12-2024	14-12-2024	2	1. Timothy Budd, “An Introduction to Object Oriented Programming”, Pearson Edition, 3rd Edition.	Practicals	Powerpoint presentation	1. Timothy Budd, “An Introduction to Object Oriented Programming”, Pearson Edition, 3rd Edition. 2. Bjarne Stroustroup “The C++ programming Language” Addison Wesley.
	16-12-2024	21-12-2024	2	2. Bjarne Stroustroup “The C++ programming Language” Addison Wesley.	Practicals		
JAN	02-01-2025	04-01-2025	2	3. Constructors and overloading	Practicals		
	06-01-2025	11-01-2025	2	4. Object composition using references	Practicals		
	13-01-2025	18-01-2025	2	5. Inheritance	Practicals		

	20-01-2025	25-01-2025	2	6. Overriding, polymorphism and dynamic binding	Practicals		
	27-01-2025	01-02-2025	2	7. Abstract class, interfaces and multiple interface inheritance	Practicals		
FEB	03-02-2025	08-02-2025	2	8. Use of static keyword	Practicals		
	10-02-2025	15-02-2025	2	9. Exception handling	Practicals		
	17-02-2025	22-02-2025	2	10. Arrays	Practicals		
	24-02-2025	01-03-2025	2	11. Collection framework – ArrayList,	Practicals		
MAR	03-03-2025	08-03-2025	2	12. Collection framework – Maps	Practicals		
	10-03-2025	15-03-2025	2	13. Minimum one exercise on each design pattern	Practicals		
	17-03-2025	22-03-2025	2	14. Generics	Practicals		
	24-03-2025	29-03-2025	2	15. Concurrency/Threads	Practicals		
APR	31-03-2025	05-04-2025	2	Revision	Practicals		
	07-04-2025	11-04-2025	2	Revision	Practicals		

Assessment Rubrics	Component	Max Marks
	ISA 1	7.5
	ISA 2	7.5
	ISA 3	7.5

	Practical	25
	Project	NA
	SEE	60