

Name of the college: Government College of Arts, Science and Commerce, Sanquelim - Goa		
Name of Faculty: Nilesh Natekar	Subject: Computer Science	
Paper code: CSC206 – Object Oriented Technologies	Program/Course: S.Y.B.Sc.	Division: A
Academic year: 2025 - 2026	Semester: III	Total Lectures: 45
Course Objectives:		
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 Learning Outcome:		
Upon completion of the course students should be able to::		
CO1. Define and recall fundamental Object-Oriented (OO) concepts, including classes, objects, encapsulation, and inheritance.		
CO2. Understand object-oriented principles.		
CO3. Analyze given problem, breakdown into logical units and solve using bottom-up approach. CO4. Develop simple Object-Oriented programs using a chosen programming language to implement basic concepts like classes, objects, inheritance and polymorphism in practical programming scenarios		

Month	Lectures From: To:	No. of lectures allotted	Topic, Subtopic to be covered	Learning outcome	ICT Tools	Reference books
June	23/06/2025 to 28/06/2025	03	- Overview of programming paradigms - Evolution and principles of object-oriented programming	1. Explain OOP concepts	Microsoft Powerpoint Presentation, LCD Projector	1. Timothy Budd, “An Introduction to Object Oriented Programming”, Pearson Edition, 3 rd Edition.
June/July	30/06/2025 to 05/07/2025	03	- Comparison with procedural programming - Introduction to key OOP concepts: - Classes – attributes and methods; - Encapsulation; class as a module and class as a type; uniform type system, static and non-static members	1. Compare POP with OOP 2. Explain OOP Concepts	Microsoft Powerpoint Presentation, LCD Projector	1. Timothy Budd, “An Introduction to Object Oriented Programming”, Pearson Edition, 3 rd Edition.
July	07/07/2025 to 12/07/2025	03	Objects – object creation; constructors and destructors; object references, object copying and cloning, object composition	2. Explain constructors, destructors, references, cloning composition	Microsoft Powerpoint Presentation, LCD Projector	1. Timothy Budd, “An Introduction to Object Oriented Programming”, Pearson Edition, 3 rd Edition.

July	14/07/2025 to 19/07/2025	03	Inheritance – types of inheritance, deferred features and classes, redeclaration, dynamic method dispatch	1. Explain inheritance, types and redeclaration	Microsoft Powerpoint Presentation, LCD Projector	1. Timothy Budd, “An Introduction to Object Oriented Programming”, Pearson Edition, 3 rd Edition.
July	21/07/2025 to 26/07/2025	03	Polymorphism – overloading and overriding	1. Explain Polymorphism	Microsoft Powerpoint Presentation, LCD Projector	1. Timothy Budd, “An Introduction to Object Oriented Programming”, Pearson Edition, 3 rd Edition.
July/August	28/07/2025 to 02/08/2025	03	Memory management – reclaiming memory, automatic memory management, garbage collection methods	1. Explain memory management	Microsoft Powerpoint Presentation, LCD Projector	1. Timothy Budd, “An Introduction to Object Oriented Programming”, Pearson Edition, 3 rd Edition.
August	04/08/2025 to 09/08/2025	03	- Interfaces - Access specifiers/modifiers	1. Explain interfaces 2. Explain Access specifiers	Microsoft Powerpoint Presentation, LCD Projector	1. Timothy Budd, “An Introduction to Object Oriented Programming”, Pearson Edition, 3 rd Edition.
August	11/08/2025 to 16/08/2025	03	Exception Handling – basic concepts, exception handling mechanism, handling multiple exceptions, rethrowing, throws, user defined exceptions	1. Explain Exception Handling mechanism	Microsoft Powerpoint Presentation, LCD Projector	1. Timothy Budd, “An Introduction to Object Oriented Programming”, Pearson Edition, 3 rd Edition.

August	18/08/2025 to 23/08/2025	03	Collection Framework – use of collection framework	1. Explain collection framework	Microsoft Powerpoint Presentation, LCD Projector	1. Timothy Budd, “An Introduction to Object Oriented Programming”, Pearson Edition, 3 rd Edition.
August/September	25/08/2025 to 06/09/2025	03	Generics/Templates – horizontal and vertical type generalization, need for type parameterization, generic classes and methods	1. Explain generics	Microsoft Powerpoint Presentation, LCD Projector	1. Timothy Budd, “An Introduction to Object Oriented Programming”, Pearson Edition, 3 rd Edition.
September	08/09/2025 to 13/09/2025	03	OOAD - Understanding the software development life cycle; Object-oriented analysis: identifying objects, classes, and relationships; Object-oriented design principles and patterns	1. Explain OOAD	Microsoft Powerpoint Presentation, LCD Projector	https://www.tutorialspoint.com/uml/index.htm
September	15/09/2025 to 20/09/2025	03	Introduction to UML Diagrams (class diagram, use case diagram, sequence diagrams)	1. Explain UML Diagrams	Microsoft Powerpoint Presentation, LCD Projector	https://www.tutorialspoint.com/uml/index.htm
September	22/09/2025 to 27/09/2025	03	Introduction to UML Diagrams (class diagram, use case	1. Explain UML diagrams	Microsoft Powerpoint Presentation,	https://www.tutorialspoint.com/uml/index.htm

			diagram, sequence diagrams)		LCD Projector	
September/ October	29/09/2025 to 04/10/2025	03	Introduction to design patterns and their significance; Common design patterns (Singleton, Factory, Observer, etc.); Implementing design patterns in code	1. Explain design patterns	Microsoft Powerpoint Presentation, LCD Projector	1. Erich Gamma, Richard Helm, Ralph Johnson, John Vlissides , “Design Patterns: Elements of Reusable Object-Oriented Software” Addison-Wesley Professional, 1st Edition.
October	06/10/2025 to 11/10/2025	03	Introduction to design patterns and their significance; Common design patterns (Singleton, Factory, Observer, etc.); Implementing design patterns in code	1. Explain design patterns	Microsoft Powerpoint Presentation, LCD Projector	1. Erich Gamma, Richard Helm, Ralph Johnson, John Vlissides , “Design Patterns: Elements of Reusable Object-Oriented Software” Addison-Wesley Professional, 1st Edition.
October	13/10/2025 to 18/10/2025	03	- Persistence and serialization - Concurrency/threads	1. Explain persistence, serialization and concurrency	Microsoft Powerpoint Presentation, LCD Projector	1. Timothy Budd, “An Introduction to Object Oriented Programming”, Pearson Edition, 3 rd Edition.

Practical Component

Month	Lectures From: To:	No. of lectures allotted	Topic, Subtopic to be covered	Learning outcome	ICT Tools	Reference books
June	23/06/2025 to 28/06/2025	02	Use of command line environment and run-time environment in Java (javac and java)	Perform commands using command line environment and run-time environment in Java (javac and java)	Microsoft Powerpoint Presentation, LCD Projector	https://www.tutorialspoint.com/java/index.htm
June/July	30/06/2025 to 05/07/2025	02	Creating classes	Perform Creation of classes	Microsoft Powerpoint Presentation, LCD Projector	https://www.tutorialspoint.com/java/index.htm
July	07/07/2025 to 12/07/2025	02	Constructors and overloading	Implement Constructors and overloading	Microsoft Powerpoint Presentation, LCD Projector	https://www.tutorialspoint.com/java/index.htm
July	14/07/2025 to 19/07/2025	02	Object composition using references	Implement Object composition using references	Microsoft Powerpoint Presentation, LCD Projector	https://www.tutorialspoint.com/java/index.htm
July	21/07/2025 to 26/07/2025	02	Inheritance	Implement Inheritance	Microsoft Powerpoint Presentation, LCD Projector	https://www.tutorialspoint.com/java/index.htm
July/August	28/07/2025 to 02/08/2025	02	Overriding, polymorphism and dynamic binding	Implement Overriding, polymorphism and dynamic binding	Microsoft Powerpoint Presentation, LCD Projector	https://www.tutorialspoint.com/java/index.htm
August	04/08/2025 to 09/08/2025	02	Abstract class, interfaces and	Implement Abstract class, interfaces and	Microsoft Powerpoint Presentation,	https://www.tutorialspoint.com/java/index.htm

			multiple interface inheritance	multiple interface inheritance	LCD Projector	
August	11/08/2025 to 16/08/2025	02	Use of static keyword	Implement classes with static members	Microsoft Powerpoint Presentation, LCD Projector	https://www.tutorialspoint.com/java/index.htm
August	18/08/2025 to 23/08/2025	02	Exception handling	Implement Exception handling	Microsoft Powerpoint Presentation, LCD Projector	https://www.tutorialspoint.com/java/index.htm
August/ September	25/08/2025 to 06/09/2025	02	Arrays	Implement Arrays	Microsoft Powerpoint Presentation, LCD Projector	https://www.tutorialspoint.com/java/index.htm
September	08/09/2025 to 13/09/2025	02	Collection framework – ArrayList, Maps	Implement and use Collection framework – ArrayList, Maps	Microsoft Powerpoint Presentation, LCD Projector	https://www.tutorialspoint.com/java/index.htm
September	15/09/2025 to 20/09/2025	02	Minimum one exercise on each design pattern	Implement minimum one exercise on each design pattern	Microsoft Powerpoint Presentation, LCD Projector	https://www.tutorialspoint.com/java/index.htm
September	22/09/2025 to 27/09/2025	02	Generics	Implement Generics	Microsoft Powerpoint Presentation, LCD Projector	https://www.tutorialspoint.com/java/index.htm
September/ October	29/09/2025 to 04/10/2025	02	Concurrency/Threads	Implement Concurrency/Threads	Microsoft Powerpoint Presentation,	https://www.tutorialspoint.com/java/index.htm

					LCD Projector	
October	06/10/2025 to 11/10/2025	02	REVISION		Microsoft Powerpoint Presentation, LCD Projector	
October	13/10/2025 to 18/10/2025	02	REVISION		Microsoft Powerpoint Presentation, LCD Projector	