Semester Lecture Plan

Name of the college: Government College of Arts, Science and Commerce, Sanquelim - Goa

Name of Faculty: Nilesh Natekar	**Subject:** Computer Science	
Paper code: CSC106 – Object Oriented Programming	**Program/Course: T.Y.B.Sc.**	**Division: A**
Academic year: 2024 - 2025	**Semester: V**	**Total Lectures: 60**

Course Objectives:

- To present the object oriented method, in viewpoint of software engineering — of the methods, tools and techniques for developing quality software in production environments.
- To study how practicing software developers, in industrial as well as academic environments, can use object technology to improve the quality of the software they produce
- Introduce Java Programming Environment and Design Patterns

Course Learning Outcome:

Upon completion of the course students should be able to::

- Use the characteristics of an object-oriented programming language in a program.
- Use the basic object-oriented design principles in computer problem solving.
- Use the basic principles of software engineering in managing complex software project
- Write Java programs using classes and object
- Implement Design Patterns in Java Programs

Month	Lectures From: To:	No. of lectures allotted	Topic, Subtopic to be covered	Learning outcome	ICT Tools	Reference books
June/July	28/06/2024 to 04/07/2024	04	CRITERIA OF OBJECT ORIENTATION • On the criteria • Method and language • Implementation and environment • Libraries	Explain Method and language used in Object Oriented Programming Explain Criteria – implementation and environment Explain Criteria - Libraries	Microsoft Powerpoint Presentation, LCD Projector	1. Bertrand Meyer , Object Oriented Software Construction, Prentice Hall; Second edition
July	05/07/2024 to 11/07/2024	04	TOWARDS OBJECT TECHNOLOGY • The ingredients of computation • Functional decomposition	1. Explain the ingredients of Computation. 2. Explain functional decomposition	Microsoft Powerpoint Presentation, LCD Projector	1. Bertrand Meyer , Object Oriented Software Construction, Prentice Hall; Second edition
July	12/07/2024 to 18/07/2024	04	TOWARDS OBJECT TECHNOLOGY • Object-based decomposition • Object-oriented software construction • Issues THE STATIC STRUCTURE: CLASSES • Objects are not the subject • Avoiding the standard confusion	1. Explain Object based decomposition, 2. Explain Object oriented software construction and the issues thereof 3. Explain objects	Microsoft Powerpoint Presentation, LCD Projector	1. Bertrand Meyer , Object Oriented Software Construction, Prentice Hall; Second edition

July	19/07/2024 to 25/07/2024	04	THE STATIC STRUCTURE: CLASSES • The role of classes • A uniform type system • A simple class • Basic conventions • The object-oriented style of computation	1. Explain the role classes. 2. Create classes	Microsoft Powerpoint Presentation, LCD Projector	1. Bertrand Meyer , Object Oriented Software Construction, Prentice Hall; Second edition
July/August	26/07/2024 to 01/08/2024	04	THE STATIC STRUCTURE: CLASSES • Putting everything together THE RUN-TIME STRUCTURE: OBJECTS • Objects • Objects as a modelling tool • Manipulating objects and references	1. Create classes 2. Create objects 3. Use Objects as modelling tool 4. Manipulate objects and references	Microsoft Powerpoint Presentation, LCD Projector	1. Bertrand Meyer , Object Oriented Software Construction, Prentice Hall; Second edition
August	02/08/2024 to 08/08/2024	04	THE RUN-TIME STRUCTURE: OBJECTS • Creation procedures • More on references • Operations on references	1. Object Creation procedures 2. Use of references 3. Perform operations on references	Microsoft Powerpoint Presentation, LCD Projector	1. Bertrand Meyer , Object Oriented Software Construction, Prentice Hall; Second edition

			• Attachment: reference and value semantics • Dealing with references: benefits and dangers			
August	09/08/2024 to 15/08/2024	04	MEMORY MANAGEMENT: • What happens to objects? • The casual approach • Reclaiming memory: the issues • Programmer-controlled deallocation • The component-level approach • Automatic memory management	1. Memory management concepts	Microsoft Powerpoint Presentation, LCD Projector	1. Bertrand Meyer , Object Oriented Software Construction, Prentice Hall; Second edition
August	16/08/2024 to 22/08/2024	04	MEMORY MANAGEMENT: • Reference counting • Garbage collection • Practical issues of garbage collection	1. Memory management methods 2. Introduction to inheritance	Microsoft Powerpoint Presentation, LCD Projector	1. Bertrand Meyer , Object Oriented Software Construction, Prentice Hall; Second edition

			INTRODUCTION TO INHERITANCE: • What is inheritance? • Overriding and Polymorphism			
August	23/08/2024 to 29/08/2024	04	INTRODUCTION TO INHERITANCE: • Typing for inheritance • Dynamic binding • Deferred features and classes • The meaning of inheritance • The role of deferred classes	1. Types of inheritance 2. Dynamic binding Deferred features and classes	Microsoft Powerpoint Presentation, LCD Projector	1. Bertrand Meyer , Object Oriented Software Construction, Prentice Hall; Second edition
August/ September	30/08/2024 to 05/09/2024	04	MULTIPLE INHERITANCE: • Examples of multiple inheritance • Feature renaming • Flattening the structure • Repeated inheritance EXCEPTION HANDLING :	• Multiple inheritance • Introduction to Exception Handling	Microsoft Powerpoint Presentation, LCD Projector	1. Bertrand Meyer , Object Oriented Software Construction, Prentice Hall; Second edition

			• Basic concepts of exception handling •			
September	13/09/2024 to 19/09/2024	04	EXCEPTION HANDLING : • Handling exceptions • An exception mechanism • Exception handling in Java GENERICITY: • Horizontal and vertical type generalization	1. Exception handling mechanism 2. Genericity - introduction	Microsoft Powerpoint Presentation, LCD Projector	1. Bertrand Meyer , Object Oriented Software Construction, Prentice Hall; Second edition
September	20/09/2024 to 26/09/2024	04	GENERICITY: • The need for type parameterization • Generic classes • Arrays	1. Implementation of genericity	Microsoft Powerpoint Presentation, LCD Projector	1. Bertrand Meyer , Object Oriented Software Construction, Prentice Hall; Second edition
September/ October	27/09/2024 to 03/10/2024	04	GENERICITY: • Generics and collection framework in Java DESIGN PATTERNS : INTRODUCTION : • What is a Design Pattern?	1. Collection framework 2. Introduction to design patterns	Microsoft Powerpoint Presentation, LCD Projector	1. Bertrand Meyer , Object Oriented Software Construction, Prentice Hall; Second edition

			• Describing Design Patterns. • How Design Patterns solve Design Problems			
October	04/10/2024 to 10/10/2024	04	DESIGN PATTERNS : INTRODUCTION : • How to select a Design Pattern • How to Use a Design Pattern CREATIONAL PATTERNS: • Factory Method • Prototype • Singleton STRUCTURAL PATTERNS: Adaptor	1. Creational and structural patterns	Microsoft Powerpoint Presentation, LCD Projector	**1.** Bertrand Meyer , Object Oriented Software Construction, Prentice Hall; Second edition **2.** Erich Gamma, Richard Helm, Ralph Johnson, John Vlissides, Design Patterns : Elements of Reusable Object-Oriented Software, Pearson
October	11/10/2024 to 17/10/2024	04	STRUCTURAL PATTERNS: • Composite • Decorator • Façade • Proxy	1. Structural patterns	Microsoft Powerpoint Presentation, LCD Projector	1. Erich Gamma, Richard Helm, Ralph Johnson, John Vlissides, Design Patterns :

						Elements of Reusable Object-Oriented Software, Pearson
October	18/10/2024 to 22/10/2024	04	BEHAVIORAL PATTERNS: • Chain of Responsibility • Command • Iterator • Observer • State • Strategy	1. Behavioral patterns	Microsoft Powerpoint Presentation, LCD Projector	1. Erich Gamma, Richard Helm, Ralph Johnson, John Vlissides, Design Patterns : Elements of Reusable Object-Oriented Software, Pearson

Practical Component

Month	Lectures From: To:	No. of lectures allotted	Topic, Subtopic to be covered	Learning outcome	ICT Tools	Reference books
June/July	28/06/2024 to 04/07/2024	04	Use of command line environment and run-time environment in Java (javac and java)	Use of command line environment and run-time environment in Java (javac and java)	Microsoft Powerpoint Presentation, LCD Projector	https://www.w3schools.com/java/
July	05/07/2024 to 11/07/2024	04	Creating classes	Creating classes	Microsoft Powerpoint Presentation, LCD Projector	https://www.w3schools.com/java/
July	12/07/2024 to 18/07/2024	04	Constructors and overloading	Constructors and overloading	Microsoft Powerpoint Presentation, LCD Projector	https://www.w3schools.com/java/
July	19/07/2024 to 25/07/2024	04	Object composition using references	Object composition using references	Microsoft Powerpoint Presentation, LCD Projector	https://www.w3schools.com/java/
July/August	26/07/2024 to 01/08/2024	04	Use of standard libraries like Math, String, util.*	Use of standard libraries like Math, String, util.*	Microsoft Powerpoint Presentation, LCD Projector	https://www.w3schools.com/java/
August	02/08/2024 to 08/08/2024	04	Inheritance	Implement Inheritance	Microsoft Powerpoint Presentation, LCD Projector	https://www.w3schools.com/java/
August	09/08/2024 to 15/08/2024	04	Overriding, polymorphism and dynamic binding	Overriding, polymorphism and dynamic binding	Microsoft Powerpoint Presentation, LCD Projector	https://www.w3schools.com/java/

August	16/08/2024 to 22/08/2024	04	Abstract class, interfaces and multiple interface inheritance	Abstract class, interfaces and multiple interface inheritance	Microsoft Powerpoint Presentation, LCD Projector	https://www.w3schools.com/java/
August	23/08/2024 to 29/08/2024	04	Use of static keyword	Use of static keyword	Microsoft Powerpoint Presentation, LCD Projector	https://www.w3schools.com/java/
August/ September	30/08/2024 to 05/09/2024	04	Exception handling	Exception handling	Microsoft Powerpoint Presentation, LCD Projector	https://www.w3schools.com/java/
September	13/09/2024 to 19/09/2024	04	Arrays	Arrays	Microsoft Powerpoint Presentation, LCD Projector	https://www.w3schools.com/java/
September	20/09/2024 to 26/09/2024	04	Collection framework – ArrayList, Maps	Collection framework – ArrayList, Maps	Microsoft Powerpoint Presentation, LCD Projector	https://www.w3schools.com/java/
September/ October	27/09/2024 to 03/10/2024	04	Minimum one exercise on each creational design pattern	Minimum one exercise on each creational design pattern	Microsoft Powerpoint Presentation, LCD Projector	https://www.w3schools.com/java/
October	04/10/2024 to 10/10/2024	04	Minimum one exercise on each structural design pattern	Minimum one exercise on each structural design pattern	Microsoft Powerpoint Presentation, LCD Projector	https://www.w3schools.com/java/
October	11/10/2024 to 17/10/2024	04	Minimum one exercise on each	Minimum one exercise on each	Microsoft Powerpoint Presentation,	https://www.w3schools.com/java/

			behavioural design pattern	behavioural design pattern	LCD Projector	
October	18/10/2024 to 22/10/2024	04	Revision		Microsoft Powerpoint Presentation, LCD Projector	https://www.w3schools.com/java/