

DEPARTMENT OF COMPUTER SCIENCE & DESIGN

COURSE MODULE FOR THE SESSION 2026(ODD SEMESTER)

Course Syllabus with CO's

Academic Year: 2024-2025							
Department: Computer Science & Design							
Course Code	Course Title	Core/Elective	Prerequisite	Contact Hours			Total Hrs/ Sessions
				L	T	P	
BCGL504	OO Design Patterns Lab	Core	Fundamentals of Object-Oriented Modelling and Design		-	2	12
Objectives: • To introduce students to the fundamental principles and concepts of design patterns and their role in object-oriented software development. • To equip students with the skills to identify and apply the most appropriate design patterns to solve common software design problems. • To develop the ability to analyze the advantages and disadvantages of different design patterns in real-world applications. • To provide hands-on experience in implementing various design patterns using object-oriented programming languages							

Topics Covered as per Syllabus	
Sl.NO	Experiments (Implementation using Star UML)
1	Design and implement Shape Factory class that generates different types of Shape objects (Circle, Square, Rectangle) based on input parameters using Factory Design Pattern.
2	Design and Implement an Abstract Factory class to create families of related or dependent objects with respect to decathlon store without specifying their concrete classes using Abstract Factory.
3	Design and implement a complex object like a House using a step-by-step Builder pattern, allowing different representations of the house (wooden, brick, etc.).
4	Design and Implement to Extend a Coffee object with dynamic features (e.g., milk, sugar, whipped cream) using Decorators.
5	Design and Implement a Logger class ensuring a single instance throughout the application.
6	Design and implement an Adapter Pattern for a Music System.
7	Design and Implement an Observer pattern for a news agency to notify subscribers of updates.
8	Design and Implement a Façade pattern for home theatre system.
9	Design and Implement a Template Method for Document Processing (word, pdf, excel).
10	Design and Implement weather monitoring system that notifies multiple display devices whenever the weather conditions change that follows the Observer Design Pattern.
11	Design and Implement a Proxy pattern to control access to an object (e.g., a protected resource or remote service).
12	Design and Implement a Mediator pattern to manage communication between a set of objects (e.g., chat room with multiple participants).

DEPARTMENT OF COMPUTER SCIENCE & DESIGN

List of URL's

- Alan Shalloway, James R Trot, "Design Patterns Explained – A New Perspective on Object Oriented Design", Pearson, 2nd Edition, 4th Impression 2010.
- Eric Freeman, Elisabeth Freeman, "Head First Design Patterns", O'reilly Publications, October 2004, 1st Edition.
- Satzinger, Jackson, Burd, "Object Oriented Analysis and Design with Unified Process", Thomson Learning, 1st Indian Reprint 2007.
- <https://www.udemy.com/course/design-patterns-java/>
- <https://nptel.ac.in/courses/106105224>.

Course outcomes: The students should be able to:

Course outcomes (Course Skill Set): At the end of the course the student will be able to:

- Design the model for the given problem using UML concepts and notations.
- Develop the solution for the given real world problem using design patterns .
- Analyze the results and produce substantial written documentation.

Internal Assessment Marks: 50 (2 Session Tests are conducted during the semester and

Marks allotted based on average of all performances scale down to 20 along with 30 LCR Marks) along with SEE for 50 Marks.

The Correlation of Course Outcomes (CO's) and Program Outcomes (PO's)

Subject Code	BCGL504			Title: OO Patterns Lab								Total
List of Course Outcomes	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	
CO-1	-	-	3	3	3	-	-	-	-	-	-	9
CO-2	-	2	3	3	3	-	-	-	-	-	-	11
CO-3	-	-	-	-	3	-	-	-	-	2	-	5
Total	-	02	06	06	09	-	-	-	-	02	-	25

The Correlation of Program Specific Outcome's (PSO's) and Course Outcome (CO's)

Subject Code	BCS303	Title: OO Patterns Lab	
List of Course Outcome's	PSO1	PSO2	Total
CO-1	2	3	5
CO-2	2	3	5
CO-3	2	3	5
Total	6	9	15

Note:- 3 = Strong Contribution, 2 = Average Contribution 1= Weak Contribution, - = No Contribution