COURSE CONTENT

DESIGN PATTERNS

VIII Semester: CE / CSD / CSE / CSM / ECE / EEE / ME

Course Code	Category	Hours / Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
2480539	Foundation	3	0	0	3	40	60	100
Contact Classes: 45	Tutorial Classes: Nil	Practical Classes: Nil				Total Classes: 45		

Prerequisites:

- **A Course on Software Engineering"**
- **A Course on "Object Oriented Programming Through Java"**

Course Overview:

This course provides that works well for academic, corporate, or self-paced learning contexts. You can adapt the depth depending on beginner vs. advanced audiences.

Course Objectives:

- The aim of the course is to appreciate the idea behind Design Patterns in handling common problems faced during building an application
- This course covers all pattern types from creational to structural, behavioral to concurrencyandhighlightsthescenarioswhenonepatternmustbechosenover others.

Course Outcomes: After Completion of the Course, Students should be able to:

- Create software designs that are scalable and easily maintainable
- Understand the best use of Object-Oriented concepts for creating truly OOP programs
- Use creational design patterns in software design for class instantiation
- Use structural design patterns for better class and object composition
- Use behavioral patterns for better organization and communication between the objects
- Use refactoring to compose the methods for proper code packaging
- Use refactoring to better organize the class responsibilities of current code

UNIT-I

Introduction: What is a design pattern? Design pattern sin Small talk MVC, Describing Design Patterns, The Catalog of Design Patterns, Organizing the Catalog, How Design Patterns Solve Design Problems, How to Select a Design Pattern, How to Use a Design Pattern.

UNIT-II

Designing a Document Editor: Design Problems, Document Structure, Formatting, Embellishing the User Interface, Supporting Multiple Look-and-Feel Standards, Supporting Multiple Window Systems, User Operations Spelling Checking and Hyphenation, Summary

UNIT-III

Creational Patterns: Abstract Factory, Builder, Factory Method, Prototype, Singleton, Discussion of Creational Patterns.

UNIT-IV

Structural Pattern: Adapter, Bridge, Composite, Decorator, Façade, Fly weight, Proxy

UNIT- V

Behavioral Patterns: Chain of Responsibility Command, Interpreter, Iterator, Mediator, Memento, Observer, State, Strategy, Template Method, Visitor.

TEXT BOOKS:

1. Design Patterns, Erich Gamma, Pearson Education

REFERENCE BOOKS:

1. Pattern'sin Java, Vol–I, Mark Grand, Wiley Dream Tech.
2. Pattern sinJava,Vol-II, Mark Grand, Wiley Dream Tech.
3. Java Enterprise Design Patterns Vol-III, MarkGrand, Wiley Dream Tech.
4. Head First Design Patterns, EricFreeman, O'reily publications

ELECTRONIC RESOURCES:

1. **https://www.coursera.org/learn/design-patterns**
2. **https://hackr.io/tutorial/design-patterns-tutorials**
3. **https://rachwal.github.io/DesignPatterns/**
4. **https://www.coursera.org/learn/design-patterns**

MATERIALS ONLINE:

1. Course template
2. Tutorial question bank
3. Tech talk and Concept Video topics
4. Open-ended experiments
5. Definitions and terminology
6. Assignments
7. Model question paper – I
8. Model question paper – II
9. Lecture notes
10. E-Learning Readiness Videos (ELRV)