

Devi Ahilya University, Indore, India Institute of Engineering & Technology				III Year B.E. (Information Technology (Full Time))			
Subject Code & Name	Instructions Hours per Week			Credits			
5ITRC2 Object Oriented Analysis & Design	L	T	P	L	T	P	Total
	Duration of Theory Paper: 3 Hours	3	1	2	3	1	1

Learning Objective

- To learn object oriented analysis, modeling and design using UML.
- To learn object oriented approach of software engineering.

Course Outcome:

Students earned credits will develop ability to

CO.No.	CO	PO
CO1	Understand the major steps of Object-Oriented software development life cycles and the tools and techniques used in these steps	PO1, PO3, PO9, PO10, PO12
CO2	Synthesize requirements for a realistic software system and write a requirements specification document Model system requirements using one or more semi-formal notations such as UML, dataflow diagrams, entity-relationship diagrams, or state diagrams	PO1, PO2, PO3, PO4, PO5, PO9, PO10, PO11, PO12
CO3	Design software systems at an architectural level and at lower levels, using one or more techniques, such as object-oriented design or agile methods, and express these designs in design specification documents Validate designs and adjust the specification or design as necessary	PO1, PO2, PO3, PO4, PO5, PO9, PO12
CO4	Participate effectively in the development of a project in a team environment. Produce professional-quality software-related documents	PO1, PO2, PO4, PO5, PO9, PO10, PO11, PO12
CO5	Develop and articulate content knowledge and critical thinking in the discipline through frequent practice of informal and formal writing. Demonstrate knowledge/understanding of audience expectations, genres, and conventions appropriate to communicating in the discipline	PO2, PO4, PO5, PO9, PO10, PO11, PO12

CO-PO Relationship

CO	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12
CO1	2	-	2	-	-	-	-	-	2	3	-	2
CO2	3	2	3	2	3	-	-	-	2	2	2	3
CO3	3	3	3	3	3	-	-	-	3	-	-	3
CO4	2	3	-	3	3	-	-	-	3	2	2	3
CO5	-	2	-	3	3	-	-	-	3	3	3	3

* CO (rows) mention nil/very small/insignificant contribution to the PO(column)

1 → relevant and small significance 2 → medium or moderate 3 → strong

COURSE CONTENTS

UNIT-I

Rational Unified Process, Process Notation, Introduction to UML, Business Modeling Workflow, Object Oriented Analysis: Requirements Overview, Problem Statement, Glossary, Supplementary Specifications, Analysis and Design Overview; Architectural Analysis overview, Use Case Analysis: finding classes from use case behavior, describe responsibility, attribute and association; qualify analysis mechanism.

UNIT-II

Importance of modeling, principles of modeling, object oriented modeling, conceptual model of the UML, Architecture, Software Development Life Cycle.

UNIT-III

Basic Structural Modeling: Classes, Relationships, common Mechanisms, and diagrams. Advanced Structural Modeling: Advanced classes, advanced relationships, Interfaces, Types and Roles, Packages.

UNIT-IV

Behavioral Modeling: Use cases, Use case Diagrams, Activity Diagrams, Events and signals, state machines, processes and Threads, time and space, state chart diagrams.

UNIT-V

Architectural Modeling: Architectural Pattern, Initial Architectural Layers, Deployment diagrams. Analysis: Analysis Mechanisms, Key Abstractions, Component diagrams, Deployment diagrams.

Learning Outcomes:

After successfully completing this course you will be able to:

- Describe Object Oriented Analysis and Design concepts and apply them to solve problems.
- Prepare Object Oriented Analysis and Design documents for a given problem using Unified Modeling Language

[1]. Books Recommended:

- [2]. Grady Booch, Object Oriented Analysis & Design with Application, Pearson Education India 2ndEdition.
- [3]. Scott W. Ambler, The Object Primer, Cambridge University Press, 2nd Edition.
- [4]. Philippe Kruchten, The rational Unified Processes & Introduction Pearson Education India 2ndEdition.
- [5]. Grady Booch, Games Rumbaugh, Ivar Jacobson, The Unified Modeling Language User Guide, Addison Wesley
- [6]. M. Blaha, J. Rumbaugh, Object Oriented Modeling and Design with UML, Pearson Education 2nd Edition, 2007.

List of Practical Assignment:

- 1. To develop a problem statement.
- 2. Develop an IEEE standard SRS document. Also develop risk management and project plan (Ganttchart).
- 3. Identify Use Cases and develop the Use Case model.
- 4. Identify the business activities and develop an UML Activity diagram.
- 5. Identify the conceptual classes and develop a domain model with UML Class diagram.
- 6. Using the identified scenarios find the interaction between objects and represent them using UML Interaction diagrams.
- 7. Draw the State Chart diagram.
- 8. Identify the User Interface, Domain objects, and Technical services. Draw the partial layered, logical architecture diagram with UML package diagram notation.
- 9. Implement the Technical services layer.
- 10. Implement the Domain objects layer.
- 11. Implement the User Interface layer.
- 12. Draw Component and Deployment diagrams.