

**3/4 B.Tech. SECOND SEMESTER**

**IT6T1                      OBJECT ORIENTED ANALYSIS AND DESIGN                      Credits: 4**

**Lecture: 4 periods/week**

**Internal assessment: 30 marks**

**Tutorial: 1 period /week**

**Semester end examination: 70 marks**

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**Objectives:**

- To provide students with a working knowledge of the underlying foundations of object-oriented design and analysis.
- To discuss the conceptual models of the problem domain of a software product.
- To explain the concepts of objects in a system and to assign responsibilities to the system components.
- To describe how the software development is represented using UML .
- To give various techniques used in analysis and design phases in the software industry.
- To discuss various cases studies and to demonstrate the concepts learned in theory.

**Outcomes:**

Student will be able to:

- Analyze problems and develop conceptual models, generate designs from the models, leading to design.
- Evaluate and improve object-oriented models and code using UML.
- Design their own projects with aids of UML Diagrams.
- Understand which code qualities are essential for writing maintainable code.
- Perform object-oriented analysis and design using different modeling views.
- Construct various UML models (including use case diagrams, class diagrams, interaction diagrams, State chart diagrams, activity diagrams, and implementation diagrams) using the appropriate notation.
- Understand and apply the different common practices used in software industry for the analysis, design and production of software.
- Become familiar with different tools used by industry in the software development process.

**Syllabus:**

**UNIT – I**

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

## **UNIT – II**

### **BASIC STRUCTURAL MODELING:**

Classes, Relationships, Common Mechanisms and diagrams.

### **ADVANCED STRUCTURAL MODELING:**

*Advanced classes, Advanced Relationships, Interfaces, Types and Roles, Packages.*

## **UNIT - III**

### **CLASS & OBJECT DIAGRAMS:**

***Terms and concepts, Common modeling techniques for Class & Object Diagrams.***

## **UNIT – IV**

### **BASIC BEHAVIORAL MODELING-I:**

***Interactions :Terms and Concepts, Common Modeling Techniques, Interaction diagrams: Terms and Concepts, Common Modeling Techniques.***

## **UNIT-V**

### **BASIC BEHAVIORAL MODELING-II:**

***Use cases, Use case Diagrams, Activity Diagrams: Terms and Concepts, Common Modeling Techniques.***

## **UNIT – VI**

### **ADVANCED BEHAVIORAL MODELING:**

***Events and signals, state machines, processes and Threads, time and space.***

***State Chart diagrams: Terms and Concepts, Common Modeling Techniques.***

## **UNIT – VII**

### **ARCHITECTURAL MODELING:**

***Component, Deployment, Component diagrams and Deployment diagrams: Terms and Concepts, Common Modeling Techniques.***

## **UNIT – VIII**

### **CASE STUDY:**

***A Banking Application and Business Application (A Trust Car Company) .***

**Text Books:**

1. Grady Booch, James Rumbaugh, Ivar Jacobson : The Unified Modeling Language User Guide, Pearson Education.
2. Rob Pandey, Pauline Wilcox: Applying UML Advanced Application, Elsevier. (UNIT-VIII).

**Reference Books:**

1. Hans-Erik Eriksson, Magnus Penker, Brian Lyons, David Fado: UML 2 Toolkit, WILEY-Dreamtech India Pvt. Ltd.
2. Pascal Roques: Modeling Software Systems Using UML2, WILEY-Dreamtech India Pvt. Ltd.
3. Atul Kahate: Object Oriented Analysis & Design, The McGraw-Hill Companies.
4. Craig Larman Applying UML and Patterns: An introduction to Object - Oriented Analysis and Design and Unified Process, Pearson Education .