2/3 MCA Second Semester

CA4T1 OBJECT ORIENTED ANALYSIS AND DESIGN (Using UML) Credits : 4

Lecture Hours : 4 periods / week Internal assessment : 30 Marks
Semester and Examination: 70 Marks

Course Description:

This UML training course is aimed at system architects, analyst/ programmers and developers who want to define detailed outside-in system requirements using use cases, a detailed object oriented implementation-free model of the system from those requirements and a layered, component-based, model of system architecture and design in order to maximize the maintainability, re-use and extensibility of the resulting code.

Course Objective:

- The basics and the necessary detail of the Unified Modelling Language.
- The basics and the detail of Object Orientation.
- How to create a first cut overview of functional requirements with actors and use cases on a use case diagram.
- How to write an effective use case description in a way that satisfies both non-technical and technical stakeholders.
- How to restructure the use case diagram to handle complex relationships between use cases without bloating the use case model.
- How to integrate the use case model with non-functional requirements, data requirements, and business rules and screen prototyping.
- How to create a detailed model of system data using classes and their relationships.
- How to recognize complex data constructs and to use the appropriate syntax to model them.
- How to map the functionality of the system requirements onto the object model using sequence diagrams.
- How to model the dynamics of system data and functionality using state charts.
- How the modelling performed during system analysis fits into an incremental model-driven development process.

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, concepts, modeling techniques for Class & Object Diagrams.

UNIT-IV

Basic Behavioral Modeling-I: Interactions, Interaction diagrams.

UNIT-V

Basic Behavioral Modeling-II: Use cases, Use case Diagrams, Activity Diagrams.

UNIT-VI

Advanced Behavioral Modeling: Events and signals, state machines, processes and Threads, time and space, state chart diagrams.

UNIT-VII

Architectural Modeling: Component, Deployment, Component diagrams and Deployment diagrams.

UNIT-VIII

Case Study: The Unified Library application

Learning Resources

Text Books:

1. Grady Booch, James Rumbaugh, Ivar Jacobson : The Unified Modeling Language User Guide, Pearson Education, 4/e, 2008.
2. Hans-Erik Eriksson, Magnus Penker, Brian Lyons, David Fado: UML 2 Toolkit, WILEY-Dreamtech India Pvt. Ltd, 2003.

Reference Books:

1. Meilir Page-Jones: Fundamentals of Object Oriented Design in UML, Pearson Education. 2002
2. Pascal Roques: Modeling Software Systems Using UML2, WILEY-Dreamtech India Pvt. Ltd. 2007
3. Atul Kahate: Object Oriented Analysis & Design, The McGraw-Hill Companies.2007
4. Mark Priestley: Practical Object-Oriented Design with UML,TATA McGrawHill 2/e, 2008..