OBJECT ORIENTED MODELING

Course Code: 13IT2103 **L P C**
4 0 3

Pre requisites: Software Engineering.

Course Outcomes:

At the end of the course, a student will be able to

CO 1: Design a system.
CO 2: Distinguish behavioral modeling diagrams.
CO 3: Explain unified process and the four Ps of the process.
CO 4: Outline the generic iteration workflow.
CO 5: Explain phases in modeling.

UNIT- I

Introduction to UML: The meaning of Object Orientation, object identity, Encapsulation, information hiding, polymorphism, generosity, importance of modeling, principles of modeling, object oriented modeling, conceptual model of the UML, Architecture.

Basic Structural Modeling: Classes, Relationships, common Mechanisms, and diagrams.

Class & Object Diagrams: Terms, concepts, modeling techniques for Class & Object Diagrams.

UNIT-II

Collaboration Diagrams: Terms, Concepts, depicting a message, iterated messages, use of self in messages.

Sequence Diagrams: Terms, concepts, depicting asynchronous messages with/without priority, callback mechanism, broadcast messages.

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

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

UNIT-III

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

The Unified process: use case driven, architecture centric, iterative, and incremental

The Four Ps: people, project, product, and process.
Use case driven process: why use case, capturing use cases, analysis, design, and implementation to realize the use cases, testing the use cases.
Architecture-centric process: architecture in brief, why we need architecture, use cases and architecture, the steps to architecture, an architecture description.

UNIT-IV
Iterative incremental process: iterative incremental in brief, why iterative incremental development? The iterative approach is risk driven, the generic iteration.
The Generic Iteration workflow: phases are the first division workflow, planning proceeds doing, risks affect project planning, use case prioritization, resource needed, assess the iteration and phases.
Inception phase: early in the inception phase, the archetypal inception iteration workflow, execute the core workflows, requirements to test.

UNIT-V
Elaboration Phase: elaboration phase in brief, early in the elaboration phase, the architectural elaboration iteration workflow, execute the core workflows-Requirements to test.
Construction phase: early in the construction phase, the archetypal construction iteration workflow, execute the core workflow.
Transition phase: early in the transition phase, activities in transition phase
Case Studies: Automation of a Library, Software Simulator application (2-floor elevator simulator)

Text Books:

1. Grady Booch, James Rumbaugh, Ivar Jacobson, *The Unified Modeling Language User Guide*, 2nd Edition, Pearson Education, 2007
2. Ivar Jacobson, Grady Booch, James Rumbaugh, *The Unified Software Development Process*, 1st Edition, Pearson Education, 2007.

References:

1. Meilir Page-Jones, *Fundamentals of Object Oriented Design in UML*, 1st Edition, Pearson Education, 2007.
2. Atul Kahate, *Object Oriented Analysis & Design*, 1st Edition, TMH, 2001.
3. Mark Priestley, *Practical Object-Oriented Design with UML*, 2nd Edition, TMH,2005.
4. Hans-Erik Eriksson, Magnus Penker, Brian Lyons, David Fado, *UML 2 Toolkit*, 1st Edition, WILEY-Dreamtech India Pvt. Ltd, 2003.

Web references:

1. http://modelica.org
2. http://openmodelica.org