OBJECT ORIENTED MODELING

Course Code: 15IT2103

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Pre requisites: Software Engineering.

Course Outcomes:

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

CO1: Design a system.
CO2: Distinguish behavioral modeling diagrams.
CO3: Explain unified process and the four Ps of the process.
CO4: Outline the generic iteration workflow.
CO5: Explain phases in modeling.

UNIT- I (10-Lectures)

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 (10-Lectures)

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 (10-Lectures)

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 (10-Lectures)

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 (10-Lectures)

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