

OBJECT-ORIENTED MODELING AND DESIGN

Written by Administrator
Sunday, 08 November 2009 11:29 -

Subject Code

: 06CS71

IA Marks

: 25

No. of Lecture Hours/Week

: 04

Exam Hours

: 03

Total No. of Lecture Hours

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: 52

Exam Marks

: 100

PART - A

Unit - 1

Introduction, Modeling Concepts, class Modeling: What is Object Orientation? What is OO development? OO themes; Evidence for usefulness of OO development; OO modeling history.

Modeling as Design Technique: Modeling; abstraction; The three models. **Class Modeling:** Object and class concepts; Link and associations concepts; Generalization and inheritance; A sample class model; Navigation of class models; Practical tips.

7 Hours

unit - 2

Advanced Class Modeling, State Modeling: Advanced object and class concepts; Association ends; N-ary associations; Aggregation; Abstract classes; Multiple inheritance; Metadata; Reification; Constraints; Derived data; Packages; Practical tips. State Modeling: Events, States, Transitions and Conditions; State diagrams; State diagram behavior; Practical tips.

6 Hours

unit - 3

Advanced State Modeling, Interaction Modeling: Advanced State Modeling: Nested state diagrams; Nested states; Signal generalization; Concurrency; A sample state model; Relation of class and state models; Practical tips.

Interaction Modeling: Use case models; Sequence models; Activity models. Use case relationships; Procedural sequence models; Special constructs for activity models.

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unit - 4

Process Overview, System Conception, Domain Analysis: Process Overview: Development stages; Development life cycle.

System Conception: Devising a system concept; Elaborating a concept; Preparing a problem statement.

Domain Analysis: Overview of analysis; Domain class model; Domain state model; Domain interaction model; Iterating the analysis.

7 Hours

PART - B

Unit - 5

Application Analysis, System Design: Application Analysis: Application interaction model; Application class model; Application state model; Adding operations.

Overview of system design; Estimating performance; Making a reuse plan; Breaking a system in to sub-systems; Identifying concurrency; Allocation of sub-systems; Management of data storage; Handling global resources; Choosing a software control strategy; Handling boundary conditions; Setting the trade-off priorities; Common architectural styles; Architecture of the ATM system as the example.

7 Hours

unit - 6

Class Design, Implementation Modeling, Legacy Systems: Class Design: Overview of class design; Bridging the gap; Realizing use cases; Designing algorithms; Recursing downwards, Refactoring; Design optimization; Reification of behavior; Adjustment of inheritance; Organizing a class design; ATM example.

Implementation Modeling: Overview of implementation; Fine-tuning classes; Fine-tuning generalizations; Realizing associations; Testing.

Legacy Systems: Reverse engineering; Building the class models; Building the interaction model; Building the state model; Reverse engineering tips; Wrapping; Maintenance.

7 Hours

unit - 7

Design Patterns – 1: What is a pattern and what makes a pattern? Pattern categories; Relationships between patterns; Pattern description.

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Communication Patterns: Forwarder-Receiver; Client-Dispatcher-Server; Publisher-Subscriber.

6 Hours

unit - 8

Design Patterns – 2, Idioms: Management Patterns: Command processor; View handler.

Idioms: Introduction; What can idioms provide? Idioms and style; Where to find idioms; Counted Pointer example.

6 Hours

Text Books:

1. **Object-Oriented Modeling and Design with UML** - Michael Blaha, James Rumbaugh , 2nd Edition, Pearson Education, 2005.

2. **Pattern-Oriented Software Architecture A System of Patterns, Volume 1** - Frank Buschmann, Regine Meunier, Hans Rohnert, Peter Sommerlad, Michael Stal John Wiley and Sons, 2006.

Reference Books:

1. **Object-Oriented Analysis and Design with Applications** - Grady Booch et al, 3rd Edition, Pearson, 2007.
2. **Practical Object-Oriented Design with UML** - Mark Priestley, 2nd Edition, Tata McGraw-Hill, 2003.
3. **Object-Oriented Design with UML and JAVA** - K. Barclay, J. Savage, Elsevier, 2008.
4. **The Unified Modeling Language User Guide** - Booch, G., Rumbaugh, J., and Jacobson, I, 2nd Edition, Pearson, 2005.
5. **Design Patterns- Elements of Reusable Object-Oriented Software** - E. Gamma, R. Helm, R. Johnson, J. Vlissides, Addison-Wesley, 1995.
6. **Object-Oriented Systems Analysis and Design Using UML** - Simon Bennett, Steve McRobb and Ray Farmer, 2nd Edition, Tata McGraw-Hill, 2002.