

5. Y. Daniel Liang (2010), Introduction to Java programming, 7th edition, Pearson education, India.

2nd Semester	MCA02004	Object Oriented Analysis & Design	L-T-P 3-0-0	3 CREDITS
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Module-I: (5 Periods)

Introduction:

Basic concepts, abstraction, encapsulation, information hiding, inheritance, dynamic binding, polymorphism, overview of OOAD.

Module-II: (10 Periods)

Unified modelling language (UML):

UML views and diagrams, Use case modeling, actors and use cases, factoring use cases; Class diagrams, class relations, association, inheritance, aggregation/composition, inheritance, dependency; object diagram, Packages, Interaction diagrams, sequence diagrams, fragments, Communication diagram; State diagram, events, guards, composite states, concurrent states, history state; activity diagram, swim lanes, events, messages, object flow, Component diagram, Deployment diagram.

Module-III: (5 Periods)

Object-oriented design process:

Overview of the design process, Domain modelling, identifying objects, boundary objects, control objects, entity objects, CRC cards, CASE support.

Module-IV: (10 Periods)

Basic principles:

SOLID principles, Single Responsibility Principle (SRP), Open-Closed Principle (OCP), Liskov Substitution principle (LSP), Interface segregation Principle (ISP), Dependency Inversion Principle (DIP), Martin's Package metrics, CK metrics, O-O metrics.

Module-V: (10 Periods)

Design Patterns:

Overview of patterns, Architectural, design, and code patterns, GRASP and GoF patterns, Expert, Creator, Law of Demeter, Controller, Singleton, Model View Separation patterns, Observer, MVC, Publish-Subscribe, Singleton, State, Composite, Façade, Decorator, Proxy, Bridge, Strategy, Mediator, Visitor, Iterator, Flyweight, Template, Memento.

Books:

1. Grady Booch, Object-Oriented Analysis and Design with Applications (Third Edition), Addison-Wesley.
2. Erich Gamma, Richard Helm, Ralph Johnson and John Vlissides, Design Patterns: Elements of Reusable Object-Oriented Software, (First Edition), Addison-Wesley.
3. Robert C. Martin, UML for Java Programmers, Prentice Hall.
4. RUMBAUGH and BLAHA, Object-Oriented Modeling and Design with UML, Pearson.
5. Bernd Bruegge and, Allen H. Dutoit, Object-Oriented Software Engineering Using UML, Patterns, and Java, Pearson.
6. Bernd Oestereich, Developing Software with UML: Object-Oriented Analysis and Design in Practice, Addison Wesley.