

**Notes:**

- In the examination *each* student picks one question from the lot of *all* 12 questions.
- The programs must be executed in UNIX / LINUX environment.

**VII SEMESTER**

**OBJECT-ORIENTED MODELING AND DESIGN**

**Subject Code: 10CS71**

**Hours/Week : 04**

**Total Hours : 52**

**I.A. Marks : 25**

**Exam Hours: 03**

**Exam Marks: 100**

**PART – A**

**UNIT – 1**

**7 Hours**

**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.

**UNIT – 2**

**6 Hours**

**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.

**UNIT – 3**

**6 Hours**

**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.

*Stichly*

**H.O.D.**

**UNIT – 4****7 Hours**

**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.

**PART – B****UNIT – 5****7 Hours**

**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.

**UNIT – 6****7 Hours**

**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.

**UNIT – 7****6 Hours**

**Design Patterns – 1:** What is a pattern and what makes a pattern? Pattern categories; Relationships between patterns; Pattern description  
Communication Patterns: Forwarder-Receiver; Client-Dispatcher-Server; Publisher-Subscriber.

**UNIT – 8****6 Hours**

**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



**Text Books:**

1. Michael Blaha, James Rumbaugh: Object-Oriented Modeling and Design with UML, 2<sup>nd</sup> Edition, Pearson Education, 2005.  
(Chapters 1 to 17, 23)
2. Frank Buschmann, Regine Meunier, Hans Rohnert, Peter Sommerlad, Michael Stal: Pattern-Oriented Software Architecture, A System of Patterns, Volume 1, John Wiley and Sons, 2007.  
(Chapters 1, 3.5, 3.6, 4)

**Reference Books:**

1. Grady Booch et al: Object-Oriented Analysis and Design with Applications, 3<sup>rd</sup> Edition, Pearson Education, 2007.
2. Brahma Dathan, Sarnath Ramnath: Object-Oriented Analysis, Design, and Implementation, Universities Press, 2009.
3. Hans-Erik Eriksson, Magnus Penker, Brian Lyons, David Fado: UML 2 Toolkit, Wiley- Dreamtech India, 2004.
4. Simon Bennett, Steve McRobb and Ray Farmer: Object-Oriented Systems Analysis and Design Using UML, 2<sup>nd</sup> Edition, Tata McGraw-Hill, 2002.

**INFORMATION SYSTEMS**

Sub Code: 10IS72  
Hrs/Week : 04  
Total Hrs : 52

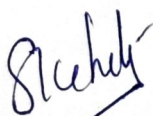
IA Marks :25  
Exam Hours :03  
Exam Marks :100

**PART – A****UNIT – 1****Foundation Concepts – 1****7 Hours**

Information Systems in Business: Introduction, The real world of Information Systems, Networks, What you need to know, The fundamental role of IS in business, Trends in IS, Managerial challenges of IT.  
System Concepts: A foundation, Components of an Information System, Information System Resources, Information System activities, Recognizing Information Systems.

**UNIT – 2****Foundation Concepts – 2****6 Hours**

Fundamentals of strategic advantages: Strategic IT, Competitive strategy concepts, The competitive advantage of IT, Strategic uses of IT, Building a customer-focused business, The value chain and strategic IS, Reengineering business processes, Becoming an agile company Creating a virtual company, Building a knowledge-creating company.

**H.O.D.**