

GUJARAT TECHNOLOGICAL UNIVERSITY

MASTER OF COMPUTER APPLICATION

SEMESTER: III

Subject Name: **Structured & Object Oriented Analysis & Design Methodology (SOOADM)**
Subject Code: **630001**

Objectives:

System Analysis and Design is a practical field that relies on a core set of concepts and principles. The objective of this course is to teach the students tried-and-tested techniques widely embraced by experienced analysts plus new and emerging tools and techniques that recent graduates are expected to apply on the job. The course is meant to give balanced exposure to both traditional and object oriented approaches to system analysis and design.

Prerequisite:

Fundamentals of Structured Programming and Fundamentals of Object Oriented Programming

Contents:

1. System Analysis Fundamentals (10%)

- Types of Systems
- Role of the System Analyst
- Systems Development Life Cycle
- CASE Tools
- Interviewing
- Joint Application Development
- Using Questionnaires

2. Analysis Modeling (15%)

- Data Flow Approach
- Developing Data Flow Diagrams
- Logical and Physical Data Flow Diagrams
- Data Dictionary
- Creating Data Dictionary
- Using Data Dictionary
- Process Specifications
- Structured English
- Decision Tables
- Decision Trees

3. System Design

(25%)

- Designing Effective Output
- Output Design Objectives
- Designing a Web Site
- Form Design
- Web Forms Design
- Data Concepts, Normalization
- Denormalization
- Data Warehouses
- Human-Computer Interaction
- Types of Interfaces
- Dialog Design
- Designing Queries
- Effective Coding
- Effective Data Capture
- Input Validation

4. Object Modeling Concepts

(15%)

- Introduction
- Modeling as a design technique
- Class Modeling-Object and Classes
- Association
- Generalization
- Aggregation
- Abstract class
- Multiple inheritance
- Metadata
- Reification
- Constraints
- Derived data
- Packages
- State Modeling- State
- Transitions and Conditions
- State Diagrams
- Nested state diagrams
- Nested States
- Signal Generalization
- Concurrency

5. Object Oriented Analysis and Design

(15%)

- Process overview- Development stages
- Development life cycle
- System conception
- Domain Analysis
- Application Analysis

- System Design
- Class Design
- Process summary

6. Basic Structural Modeling

(10%)

- Classes
- Relationships
- Common Mechanisms
- Diagrams
- Class Diagrams

7. Behavioral Modeling

(10%)

- Interactions
- Use Cases
- Use Case Diagrams
- Interaction Diagrams
- Activity Diagrams

Main Reference Book(s):

- 1) Systems Analysis and Design by Kendall & Kendall, PHI Publication, 7th Edition.
- 2) Object-Oriented Modeling and Design with UML by Michael Blaha, James Rumbaugh, Pearson Education Publication, 2nd Edition.
- 3) The Unified Modeling Language - User Guide by Grady Booch, James Rumbaugh, Ivar Jacobson, Pearson Education Publication.

Suggested Additional Reading:

- 1) Modern Systems Analysis and Design by Jeffrey A. Hoffer, Joey F. George, Joseph S. Valacich, Prabin K. Panigrahi, Pearson Education Publication, 4th Edition.
- 2) Object Oriented Analysis and Design Using UML by Mahesh P. Matha, PHI Publication
- 3) UML Distilled by Martin Fowler, Pearson Edition, 3rd Edition.
- 4) Object Oriented Systems Development Using the Modified Modeling Language by Ali Bahrami, Tata McGraw Hill Publication.
- 5) System Analysis and Design with UML Version 2.0 by Alan Dennis, Barbary Haley Wixom, David Tegarden, John Wiley India Publication, 2nd Edition.
- 6) Applying UML and Patterns by Craig Larman, Pearson Education, 2nd Edition.
- 7) An Introduction to Object-Oriented Analysis – Objects and UML in Plain English by David William Brown, John Wiley & Sons Publication, 2nd Edition

Chapter-wise coverage from main reference book:

Book	Chapters
1	1,4,7-9,11-15
2	1-6,10-16
3	1-8,15-19

Accomplishments of the student after completing the course:

After completion of the course the students would be well versed with

- The role of System Analyst
- Modern structured analysis approaches
- Key modeling concepts that apply to both the traditional structured approach and the newer object-oriented approach
- Unified Process and use of UML for Object-Oriented Analysis and Design