Material Module for System Analysis and Design

ARBA MINCH UNIVERSITY		ARBA MINCH INSTITUTE OF TECHNOLOGY

FACULTY OF COMPUTING & SOFTWARE ENGINEERING

Course Title:	System Analysis and Design (Tec3061)
Compiled By	Mr. Yilikal Binalf
Course Description	This course will explore the Introduction to Object Technology; Principles of Modeling, Principles of Object Orientation; systems development using the object technology; Modeling; principles of modeling; requirements gathering and modeling using use case; techniques of modeling static and dynamic of systems; finding classes; Interaction Diagrams - sequence and collaboration diagrams; Class Diagrams; object diagram; activity diagram; State chart diagrams; component diagram; deployment diagram. Individual and/or team project involving reports and walk-through in systems analysis and design is also a major component of this course using CASE tools.
Course Objectives	At the end of the course students will be able to: • Understand the object technology and modeling principles. • Know the techniques of modeling aspect of systems • Analyze user requirements using UML of OO techniques. • Make a detailed design using UML of OO techniques.

Course Outline

Chapter 1: System Development Life Cycle

- What is system?
- System Components
- Systems Panning and Selection
  - Identifying and selecting Systems Development project
  - Initiating and Planning Systems Development project
  - Structuring System Process Requirements
  - Structuring system Logic Requirements
  - Structuring System data Requirements
- Overview of Structural Paradigm

Chapter 2: System design

- Designing databases
  - Logical Database Design
  - Physical Database Design
  - Normalization
- Designing the human interface
  - Interface Prototype

Chapter 3: Systems implementation and Maintenance

- System implementation
- Systems Maintaining information systems

Chapter 4: Understanding the Basics: Object oriented concepts

- OO concepts from structured point of view
- Abstraction, Encapsulation and information hiding
- inheritance
- Association
- Aggregation
- Collaboration
- Coupling
- Cohesion
- polymorphism
- Interfaces
- components
- Patterns
- Persistence

Chapter 5: Object Orientation the new software paradigm

- The potential benefits of object orientation
- The potential drawbacks of object orientation
- Object standards
- The object orientation software process

Chapter 6: Gathering user requirements

- Putting together requirements gathering team
- Fundamental requirements gathering techniques
- Essential Use Case Modeling
- Essential User Interface Prototyping
- Domain modeling with class responsibility collaborator (CRC) cards
- Developing a supplementary Specification
- Identifying Change Cases

Chapter 7: Ensuring Your Requirements Are correct: Requirement validation Techniques

- Testing Early and Often
- Use Case Scenario Testing

Chapter 8: Determining What to Build: OO Analysis

- System Use Case Modeling
- Sequence Diagrams: From Use Cases to Classes
- Conceptual Modeling: Class diagrams
- Activity diagramming
- User interface prototyping Evolving your supplementary specification
- Applying Analysis patterns Effectively
- User Documentation
- Organizing your models with packages

Chapter 9: Determining How to Build Your System: OO Design

- Layering your models: Class Type Architecture
- Class Modeling
- Applying Design Patterns Effectively
- State chart modeling
- Collaboration Modeling
- Component Modeling
- Deployment Modeling
- Rational Persistence Modeling
- User Interface Design

Text book

1. Ambler, S. W. (2001). The Object primer: The Application Developer's Guideto Object Orientation and the UML Second edition. New York. Cambridge University Press References
2. Booch G., (2000). Object oriented analysis and design with applications, Second Edition, Pearson Education,Inc.
3. Hoffer J.,George J. ,Valacich J. . (2008). Modern Systems Analalysis and Design. 5th Edition. Pearson Education.
4. Subburaj R. (2003). Object Oriented with C++ ANSI/ISO Standard.Vikas Publishing House PVT LTD.
5. Priestley M. (2003). Practical Object-oriented Design with UML. second Edition McGraw Hill Education.