

CS 521: Object-Oriented Analysis and Design

Objectives

Each successful student will:

- Demonstrate knowledge of structural and behavioral modeling techniques.
- Demonstrate knowledge of a model-based software development methodology.
- Application of the methodology and the modeling techniques in a significant software design project.
- Demonstrate knowledge of design patterns and their application in a software design project.
- Demonstrate knowledge of Design and Testing Process Improvement Models.

Prerequisites

- CS 445 or CS 487.
- (Credit will not be given for CS 521 if CS751 is taken.)

Syllabus

- Introduction to the Design Process Improvement Model
 - Six-Level Improvement Process
- UML Structural Modeling Techniques
 - Basic Building Blocks -- objects and classes
 - Structural Composition Techniques
 - Design Scaling Issues
- UML Behavioral Modeling Techniques
 - Use Case Diagrams
 - Interaction Diagrams
 - Event State Diagrams
 - Action Matrices
 - Business Lifecycle Diagrams
 - Activity Diagrams
 - Collaboration Diagrams
 - Rule Specification Techniques
 - Behavioral Model-Based Reference Architecture for Component Specification
- Design Standards
 - Architectural Patterns
 - Design Patterns
 - Program Patterns
 - Behavioral Design Units
 - Component-Based Specification Techniques
- DPIM - Level One
 - Requirements Analysis Techniques
 - Ad Hoc Approach to Design
- DPIM - Levels Two, Three and Four
 - Design Methodology Deployment
 - Design Quality Control Properties and Analysis Techniques
 - Automatic Convertability
 - Traceability
 - Standardizability (Design Units/Reusable Patterns)
 - Modularity
 - Changeability (Change Management)
 - Scalability of Design
 - Reliability
- DPIM - Levels Five and Six
 - Design Process Management and Optimization
 - Design Metric Models
 - Testing Maturity Model
 - Extended V-Model
 - Testing Techniques
- Level-by-Level Improvement Case Study

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