CS 4550: SOFTWARE ARCHITECTURE AND DESIGN

Semester Hours: 3.0  
Coordinator: Robert Dyer  
Text: Pattern-Oriented Software Architecture, A System of Patterns: Vol 1  
Author(s): FRANK BUSCHMANN  
Year: 2000

SPECIFIC COURSE INFORMATION

Catalog Description:

Principles and concepts of analyzing and designing large software systems. Analysis of software systems. Designing software systems using design patterns and object-oriented techniques. Prerequisites: Grade of C or better in CS 3540. Credits cannot be received for both CS 4550 and CS 5550. Approved for distance learning.

Course type: ELECTIVE

SPECIFIC COURSE GOALS

- I can select and use appropriate design patterns.
- I can specify a software system's architecture using UML.
- I can understand separation of concerns and its impact on software design.
- I can architect a software system based on the given requirements.
- I can perform a design review on a software system.

SOFTWARE ENGINEERING STUDENT OUTCOMES ADDRESSED BY THIS COURSE

- SE 1 An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
- SE 2 An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
• SE 6 An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions

LIST OF TOPICS COVERED

• Introduction and Importance of Design
• Software Architecture
  o Components and connectors
  o Constraints
  o Composition
• Unified Modeling Language
• Software Design
  o Design reviews
  o Inter-operability
  o Separation of concerns
• Object-oriented Design
  o Design patterns
  o Information hiding
  o Interfaces
  o Inheritance and polymorphism