CEN 5064 - Software Design

Catalog Description:
Study of object-oriented analysis and design of software systems based on the standard design language UML; case studies. (3 credits)

Prerequisite:
CEN 4010 – Software Engineering I or CEN 5011 – Advanced Software Engineering.

Type
Can be an Elective for MSCS, MSIT, MSTN, and Ph.D. students

Course Objective:
The purpose of this course is to conduct in-depth study of object-oriented analysis and design of software systems based on the standard design language UML. Primary topics of study include the use-case driven approach for software analysis, system design and detailed design. In particular, emphasis will be made on how to strengthen major design qualities such as robustness, changeability, interoperability, and reliability via UML based concepts, processes, methods and techniques. If time allows, a complete case study will be discussed.

Topics
Review the phases of the software process (1 week)
Review of UML diagrams used in the phases of the development life cycle (1 week):
Static modeling (2 weeks)
      Class diagrams
      Object diagrams
Dynamic modeling (2 weeks)
      Sequence diagrams
      State machines
      Activity diagrams
Software Architectural Design (2weeks)
      N-Tier (peer-peer, client-server, 3-tier, 4-tier)
      Pipe and Filter
      Repository
      Service-oriented
      Event driven
Detailed Design and Design Patterns (2weeks)
      Creational
      Structural
      Behavioral
      Concurrency
Model-Driven Software Development (3 weeks)
      Metamodeling
      Domain Architectures
      Model transformation
      Code generation
Current research (1 week)

Required Text: Carlos E. Otero. "Software Engineering Design: Theory and Practice (Applied Software Engineering Series)", Auerbach Publications; 1 edition (June 11, 2012). ISBN-10: 1439851689, ISBN-13: 978-1439851685

Recommended Text: Markus Völter and Thomas Stahl, "Model-Driven Software Development: Technology, Engineering, Management", Wiley 2005, ISBN: 978-0-470-02570-3.

Other reading material: Relevant papers from conference proceeding and journals.

Last Update
Peter J. Clarke 10/29/2012