CEN 4065 Software Architecture & Design (CRN 80532)
AB7 Room 127 & Holmes 429 Lab; Wednesday 9:30-10:45
(plus additional online part on Canvas)
Software Engineering Program, Whitaker College of Engineering
Fall 2014 Course Syllabus - tentative
http://itech.fgcu.edu/faculty/zalewski/CEN4065/CEN4065.html

1. Catalog Description

This course guides the students through the engineering process of building the software architecture and designing the software product according to rigorous design criteria. Additional emphasis is placed on the use of design tools and applications from the area of embedded real-time systems.

2. Course Objectives and Specific Learning Outcomes

Students will develop essential concepts of software design, design analysis and documenting of software and systems, focusing on the design phase as a stage in the simplified version of the waterfall model of software development. Object-oriented software engineering approach will be followed, possibly supported with software tools. Additional topics, such as design security, formal approaches and methods, agile development can also be covered. Learning the concepts will be enforced by small team projects, to design and develop a piece of software for a practical application. Specifically, the student will acquire:

- understanding of general principles of software product design
- the comprehension of key issues in a software design process
- the ability to develop software architecture
- the ability to use elementary design patterns
- the ability to compose specific design documents
- awareness of the criteria of designing user interfaces
- the ability to evaluate quality of software designs
- the ability to use specific software design notations
- the ability to distinguish between different design methodologies
- awareness and practical knowledge of the use of software design tools.

3. Prerequisites

CEN 3073 for level UG with min. grade of C and COP 3530 for level UG with min. grade of C.

4. Textbook

Textbook resources website: http://www.softwareengineeringdesign.com/
Basic reading includes the IEEE Std 1016 Recommended Practice for Software Design Descriptions.
See draft: http://www.urisan.tche.br/~pbetencourt/engsoftII/IEEE-P1016-d50.PDF
Additional readings will be based on material available from Internet sources or provided by Instructor.
5. Course Outline

As this course is partially project-based, weekly meetings will be devoted to lecturing of relevant material and discussions of progress in development made throughout the past week, with new action assignments for the following week. Weekly readings will be assigned, followed by mandatory participation in a discussion group on FGCU Canvas learning management system. Team presentations will be scheduled throughout the semester. Maximum size of a team cannot exceed 3 members (preferably 2). The suggested software tool to document the designs is StarUML. The tentative schedule is as follows:

- Week 1: Introduction. Fundamental Concepts of Software Design
- Week 2: High-Level Design Methodologies, Notations & Tools
- Week 3: Designing the Software Architecture – Static and Dynamic Descriptions
- Week 4: Presentations on Design Patterns (I)
- Week 5: Presentations on Design Patterns (II)
- Week 6: Design for Security
- Week 7: Essentials of Detailed Design
- Week 8: Midterm Project Verification (I)
- Week 9: Midterm Project Verification (I)
- Week 10: Software Design Quality and Verification
- Week 11: Documenting Software Designs
- Week 12: Designing User Interfaces
- Week 13: Safety, Security, Reliability and Fault Tolerance
- Week 15: Thanksgiving Holiday (no class meeting, but assignments possible)
- Week 16: Project Finalization and Verification (with demos)
- Week 17: Exam Time (Monday, December 8) Project Finalization and Verification (with demos)

6. Administrative Issues

**Project:** Software Design Projects as a part of the software development process are an essential part of this course. Assessment will be based on producing Software Design documentation and Project Demonstration. Detailed topics and schedule will be determined on a week-by-week basis, depending on the complexity of projects and their progress. Entire project is worth 50% of the grade.

**Readings, Assignments & Quizzes/Exams:** Readings and other assignments related to specific project topics will be assigned on a weekly basis, if necessary (worth 20% of the course grade). Quizzes and Exams will be offered via Canvas (worth 30% of the grade).

**Grading Policy:** A: 90-100%; B: 80-89.9%; C: 70-79.9%; D: 60-69.9%; F: < 60%; (plus/minus grades at the discretion of Instructor).

**Attendance:** Since this course is project-based, where team work is an essential condition of success and absences hurt the team, attendance is strictly required. Three absences in meetings form the grounds for decreasing a grade by one letter level. A single absence is defined as missing 30 minutes or more of the time of the meeting. Students will be required to sign up and sign out on a sheet provided each week. *Note.* Please, no food or drinks in the classroom or lab; no cell phones in class, lab and instructor’s office.

**Ethics, Disabilities Act, and Observance of Religious Holidays**
Instructor follows general university policies as spelled out, respectively, in:
- Academic Behavior Standards & Academic Dishonesty Policy in the Student Guidebook (sections on “Student Code of Conduct” and “Policies and Procedures”)
  See: http://studentservices.fgcu.edu/JudicialAffairs/
- Americans with Disabilities Act of 1990 – services provided by Office of Adaptive Services
  See: http://studentservices.fgcu.edu/adaptive/
- Policy 4.005 Student Observance of Religious Holidays
  See: http://www.fgcu.edu/generalcounsel/policies-view.asp

**Disclaimer.** This syllabus has been prepared to the best of the Instructor’s knowledge, but the right is reserved to modify or adjust it slightly depending on circumstances beyond Instructor’s control.