CS1530 Software Engineering

Instructor: Prof. S. K. Chang
Office: 6101 Sennott Building
Office Hours: 2:15pm to 3pm, 4:15pm to 5pm MonWed
Telephone: 412-624-8423
E-mail: chang@cs.pitt.edu

Grader: TianYi Cui (Tsui)
Office: 6508 SQ
Office Hours: Tu 3pm to 6pm, Th 10am to 1pm
Telephone: 412-624-8866
E-mail: tic43@pitt.edu

Time and Classroom: MonWed 1pm to 2:15pm, 3pm to 4:15pm

Course Description: This course is one of the courses in the software engineering track. This course is intended to cover the object-oriented approach to software engineering, combining both the theoretical principles and the practical aspects of software design using the JAVA language. Students will learn the fundamentals of object-oriented software engineering and participate in a group project on software design using JAVA. Students will further learn the agile software development methodology. Therefore there are no individual exercises, only group projects with at least five milestones following classical software development lifecycle and at least one iteration of agile software development. The midterm and final cover the principles of software design methodology with emphasis on object-oriented approach rather than the traditional structural approach. The sequel of this course is CS1631 Software Design Methodology.

Recommended: *Object-Oriented and Classical Software Engineering*, Stephen R. Schach, McGraw Hill, 5th edition, 2002 (ISBN 0-07-239559-1).

Shari L. Pfleeger and Joanne M. Atlee, *Software Engineering Theory and Practice* 3rd Edition, 2006.

Reference: Bernd Bruegge and Allen H. Dutoit, *Object-oriented Software Engineering*, Prentice Hall 2000 (ISBN 0-13-489725-0).

Classnotes: Lectures and exams are based on classnotes, which are available at http://www.cs.pitt.edu/~chang/153/1530syl.html.

Grading: Grades are based upon project (40%), two quizzes (10%), midterm (25%) and final exam (25%). Please read the grading policy.

Project: Project will combine JAVA programming with WWW database programming to design a web-based information system for social networking. Project may optionally utilize the Kinect interface for social networking. An introduction for Kinect interface has been prepared to facilitate your project. A more advanced tutorial can serve as a follow-up. Furthermore, an add-on Kinect interface can augment the usual web interface.

On-line interactions: In addition to classroom lectures, this course will emphasize on-line interactions. In fact, the instructor hopes to offer this course (and other courses) by distance learning in the future. Therefore, on-line interactions will be an important, necessary component of this course. The course materials, announcements and exercises will all be available from the Internet. Impromptu meetings and schedule changes will be announced by e-mail.

Answers to Frequently Asked Questions

Undergraduate Innovation Research Award

Calendar

Part I: Basic Principles (Chapters 1-6) (Chapter 1-5) (first seven weeks)

Week 1
Introduction to software engineering

Week 2
The Software Process and Its Problems

The Software Life-Cycle Models

Week 3
Software Project Management

First Milestone - The Software Plan (see calendar)
(The *cost* and *schedule* can be supplied at the Second Milestone.)
Deliverables: Hard copy (preferably a single, stapled document consisting of the software plan and the presentation) and an electronic file (preferably a single file in pdf format with name such as G02.pdf) of the following:

- The software plan (without 4.0 and 5.0).
- A presentation of your product highlights and overview of software plan.

Week 4
Requirements

Second Milestone: (see calendar)
Deliverables:

- Preliminary Requirements Spec.
- Preliminary User's Manual.
- The cost and schedule of the Software Plan from the First Milestone.

Week 5
Specification

Quiz 1 (solution) (see calendar)

Week 6
Software Design Approaches

Modular Design

Third Milestone: (see calendar)

- Complete Requirements Spec.
- Please go to: http://ksiresearchorg.ipage.com/spg/ and use this SPG tool to learn about different software process models. When you enter the parameters according to the needs of your project, what software process model is suggested by SPG? Is this suggestion consistent with your expectations? Please try at least Waterfall and Scrum. After you have tried it please fill out the questionnaire. The deliverable is a PDF file or WORD file containing the screen dumps captured using PrintScreen key.

Week 7
CASE tools

Part II: Object Oriented Design (Chapters 7-14) (Chapters 6-14) (second seven weeks)

Introduction to Objects

Week 8
CRC (Class, Responsibilities and Collaborators) Cards and IC cards

Midterm Exam (see calendar) (Chapters 1-6 of 4th edition) (Chapters 1-5 of 3rd edition)

Week 9
Object-Oriented Analysis

Object-Oriented Design

Week 10
Testing Principles and a sample test plan.

Fourth Milestone: (see calendar) (OOA & OOD. **Deliverables:** An example of the OOA is in Appendix G or Section 12.8 of the textbook. An example of the OOD is in Appendix H (or Appendix I) of textbook. For the OOA part you only have to do the modeling for a few of the modules. For the OOD part it must be comprehensive. For each class (or module), please add a "box" specifying class (or module) name and all attributes, their type and format. This is not a big document. Approx. 20 pages)

Week 11
**Verification and Validation*

**Test Automation*

Fifth Milestone: (see calendar) (Initial Implementation, and Test Plan. **Deliverables:** Java (or C++) source codes. Test cases are in Appendix J)

Week 12
Formal Verification Technique

Sixth Milestone: (see calendar) (Testing. **Deliverables:** Both test cases and results are to be delivered. An example of test cases is in Appendix J of textbook. Test cases delivered as part of the 5th milestone, and actual test results at this milestone)

Week 13
Agile Software Development

Agile Software Management Tool: https://www.zoho.com/sprints/

Quiz 2 (see calendar)

Week 14
Implementation and Integration Issues

Software Maintenance

First Sprint: (see calendar) (Agile Software Development. **Deliverables:** Results after First Iteration)

Week 15
Class Review

Project Presentation, Demo and acceptance testing for software implementation (see calendar)

Deliverables: A demo and the entire report, incuding requirements spec, design, source codes, test plan and testing results, user's manual, installation and maintenance procedures)

Final Exam (see calendar) (Chapters 1-14)

THIS IS IT!

Note: If you have a disability for which you are or may be requesting an accommodation, you are encouraged to contact both your instructor and Disability Resources and Services, 216 William Pitt Union, (412) 648-7890/(412) 383-7355 (TTY), as early as possible in the term. DRS will verify your disability and determine reasonable accommodations for this course.