

CS130 – Software Development

Spring, 2008

Course Information

OVERVIEW: Very large and complex software systems cannot be designed and implemented by a single individual in a reasonable amount of time. Thus, the area of Software Engineering addresses the methods, tools and skills necessary to conceive, design, implement, test and maintain software systems -- typically in a group development setting -- in order to deliver completed software products on time, within budget, and according to the desired specifications of the customer. The course will be programming-intensive and involve one or more large-scale group projects and presentations, as well as numerous individual assignments. The course will also be writing-intensive.

PREREQUISITES: successful completion of CS030 Intro to Computer Science II.

COURSE OBJECTIVES: From the Westmont Catalog: “Software life-cycle. Fundamental concepts of software design. Supporting modern language features. Verification and validation techniques. The course is built around a major group software project.”

Generally, students should learn the skills and mindset necessary to approach and accomplish the development of a large-scale software project. More specifically, satisfactory completion of the course will enable students to enter the commercial software industry as a contributing member of a software development team. The successful student in this class will also be prepared to take a graduate-level course in Software Engineering should she or he choose to continue their education in graduate school.

In this course, students will learn the core concepts and skills in computer science surrounding the development of large software artifacts by groups of people; improve their ability to write and to give group presentations; gain experience tackling a problem that will require creative problem solving; reflect on how their faith informs their possible career in software development and computer science more generally.

GENERAL EDUCATION REQUIREMENTS: This course fulfills the new General Education requirement of a “writing-intensive course within the major” within the Common Skills category. As computer scientists, it is important to learn to communicate effectively in written form with peers, end-users, supervisors, clients, and support staff. Computer scientists need to learn to target their writing to these different communities and others in appropriate writing styles and contexts. The fact that software today is developed in, and maintained by, large teams of professionals representing a diversity of background, expertise, technical training, and discipline, makes it all the more imperative to develop the skills of effective written communication. The course also fulfills the Productions and Presentations section of the Competent and Compassionate Action requirement.

DAYS, TIME & PLACE: Tuesday and Thursday, 8:00-9:50am, KSC 218

TEXT(S):

The Mythical Man-Month (anniversary edition), Frederick P. Brooks, Jr. Addison-Wesley. (1995).

[required]

Agile Web Development with Rails, Dave Thomas & David Honsson. Hackett Publishing. (2003).

[required]

[see course webpage for other recommended and optional resources]

COURSE WEBPAGE: <http://www.westmont.edu/~iba/teaching/CS130>

INSTRUCTOR: Dr. Wayne Iba, IBA@WESTMONT.EDU, x6799

OFFICE HOURS: See course webpage, or other times by arrangement

Course Assignments, Requirements and Policies

ASSIGNMENTS: Assignments will be given periodically with specific due dates. You will be required to write analyses of readings from *The Mythical Man-Month* or other assigned papers from the software

engineering literature. There will be six to nine separate reading analysis assignments. Each paper will be evaluated by fellow students prior to submission for grading by the instructor. Students are graded on both the content and style of their own analyses, but also on the quality of their peer reviews. Formatting guidelines will be provided and carefully followed. Late individual assignments will not be accepted.

GROUP PROJECT: You will work as a member of a team developing a significant software product. A *significant* project performs a task of interest to a community of people, has a scope that exceeds what could be written by one person during a semester, and could reasonably be expected to be used on an ongoing basis. For example, your group could make a significant contribution to, or initiate an open-source project. Your product will be evaluated based on the functionality of the final result, the quality of periodic deliverables, the quality of the documentation, and the elegance of the design (i.e., maintainability). Over the course of the semester, your group will probably produce hundreds of pages of written work including problem analysis and scope, requirements definitions, documentation, program code, and test plans. There will be five separate written project deliverables that each group will submit. As this is a group project, late assignments (deliverables, presentations, etc) will not be accepted. Each student will receive an individual grade on their contribution to the project as assessed by their peers and on their presentation as assessed by the instructor. Each group will also receive a single grade based on the project as a whole.

CLASS PRESENTATIONS: Students will make at least one presentation to the class. Usually, the presentation will involve the group project, but in some cases (when arranged with the instructor) could be a report on a selected topic from the Software Engineering literature.

TESTS & EXAMS: There will be no mid-term but there will be a take-home final exam handed out one week prior to the final exam date. Your completed exam will be due by the end of the regularly scheduled exam time for CS130. No late exams will be accepted.

ATTENDANCE: Even though this is an 8am class, attendance will be graded. Unexcused absences beyond the number allotted by Westmont policy (4) may result in your removal from the class with a grade of F. You are required to attend group meetings that may be arranged at times outside of class. Your peers will be partially determining your grade; they might lower your grade if you unreasonably miss project meetings.

GRADING: Students will be evaluated on how well they master the skills needed for software development; these include critical analysis of a problem, team participation and collaboration, clear and concise writing of both code and documentation, and disciplined testing. Evaluation will consist of a project evaluation, and an industry-type performance evaluation. Letter grades for the course will be based on the standard 10% scale. The final grade will be determined from a weighted combination of components as follows: class participation/preparation (15%), class presentations (10%), project deliverables (individual and group) (40%), peer assessment (10%), reading analyses (15%), and exam(s) (10%).

ACADEMIC HONESTY: As in every area of life, I presume that you behave honestly within the context of this class. This reflects the respect that I grant each student coming into an academic relationship. If you act dishonestly toward me or your peers, you break that relationship. Do not attempt to receive credit for work that is not your own without properly acknowledging sources via appropriate citations or references. You are encouraged to get help from your peers but make sure you acknowledge such help and that you subsequently understand the help you received. The nature of the group project(s) makes this slightly unusual. On individual assignments, you must document and acknowledge every source of assistance. For group deliverables, you should think of the group as an individual and document every source of assistance outside the group. The consequence of violating the trust I implicitly extend to you will typically be an F in the course for reason of academic dishonesty (first incident). But more serious and distressing will be the damage done to our relationship.