COMP 4882: Capstone Software Project

Spring 2013

Tue, Thu 2:40–4:05 p.m.
FedEx Institute of Technology 226

http://www.cs.memphis.edu/~sdf/comp4882/

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Office Hours: Tue, Thu 2:00–2:30 p.m., 4:10–5:10 p.m., or by appointment
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1 Catalog Description

COMP 4882 - Capstone Software Proj (3)
Development of significant team project; continuation of COMP 4081; software project management; risk assessment. software requirements and specifications; software design; software validation; professional and ethical responsibilities. PREREQUISITE: COMP 3160, 3715, 4030, and 4081, or permission of instructor. (Sp)

2 Why This Course?

This course provides students with additional practical experience in software engineering building on the concepts learned in COMP 4081. Students work in teams to iteratively develop a medium-sized software system using the Unified Process. Lecture materials include good design principles, ethics, and critical systems.

3 Textbooks

3.1 Required Texts

- *Ethics for the Information Age* (5th ed.)
  by Quinn, Addison-Wesley, 2010.
  - This book is also required for COMP 3160, 3715, and 4081.
  - I will definitely refer to this book.
  - If you already have an older edition, no need to buy the newest one.

3.2 Optional Texts

- *Applying UML and Patterns: An Introduction to Object-Oriented Analysis and Design and Iterative Development* (3rd ed.)
  by Larman, Prentice Hall, 2004.
  - This book was required for COMP 4081.
  - I probably won't refer to it much.

- *Software Engineering: Theory and Practice* (4th ed.)
  by Pfleeger and Atlee, Prentice Hall, 2009.
  - This book makes a nice reference, but I will probably not refer to it.

4 Team Project Policies and Procedures

The centerpiece of this course is a team software project. Teams of 4±1 students will work together to develop a software system for a customer.

4.1 Team and Project Assignments

Each team will work on a different project with a different customer. *I reserve the right to assign the teams for projects, and to reshuffle them at will.*

4.2 Roles

There will be several key roles that various individuals will play during the project. Table 1 summarizes these roles.

Table 1. Roles that people will play during the project.

Role	Description
Customer	Person who sets the requirements for the software and who prioritizes what should be built and when. Someone from outside the course generally plays this role.
Manager	Person who makes sure that the team has the necessary resources to complete the project and who monitors the team's progress throughout the project. The instructor and teaching assistants play this role.
Developer	You and the other students on your team.
Team Leader	One member of each team will be assigned this role. The leader will be responsible for making sure that meetings run efficiently and smoothly, and for making final decisions in the event of disagreements. Leaders may be changed at the beginning/end of each iteration.

4.3 Iterations and Milestones

The project work will be spread across 4 iterations, each taking 3–4 weeks to complete. Each iteration will be capped by the completion of a milestone and a presentation by each team. Table 2 describes each of the 4 milestones.

Table 2. Project milestones.

Milestone	Goal	Deliverables
Project Plan	To demonstrate that the team understands (1) what they're supposed to build, (2) how they will build it (in broad strokes), (3) how they will schedule the work, (4) how they will ensure its quality, and (5) what risks they face.	• Plan document(s) • Presentation
Alpha	To implement the most "important" features of the system and to mitigate all the identified risks.	• Alpha version • Demo presentation
Beta	To have all the system's features implemented and basically working (although polishing and bug fixes may be needed).	• Beta version • Demo presentation
Release	To have the system finished, polished, and ready to turn over to the customer.	• Release version • Demo presentation

At the start of each iteration (after the planning one), your team must

1. choose a set of features to implement that iteration,
2. determine the tasks that must done to complete the features, and
3. assign tasks to each team member.

Your manager will specify how much work each team member is expected to accomplish in a given iteration.

During each iteration, each team will meet weekly with the manager for a *standup meeting*, which is a meeting so short that there's no need to sit down. The purpose of the meeting is to update the manager as to the tasks that each team member has accomplished, and to make the manager aware of any issues that have arisen and require subsequent action/discussion.

5 Evaluation

Grading weights are as follows:

- 75% Team Project
  - Individual Productivity
    - 33% Regular Productivity
    - 5% Above and Beyond Productivity
  - Milestones
    - 8% Project Plan
    - 7% Alpha Milestone
    - 7% Beta Milestone
    - 15% Release Milestone
- 10% Homework
- 5% Major Field Test
- 10% Participation

Table 3. Grading scale.

A+	≥ 97%
A	91–96%
A−	89–90%
B+	87–88%
B	81–86%
B−	79–80%
C+	77–78%
C	71–76%
C−	69–70%
D+	67–68%
D	60–66%
F	≤ 59%

To convert from percentages to letter grades, see Table 3. I reserve the right to *lower* the percentage threshold for letter grades as I see fit (i.e., I may make the grading scale better for you, but never worse).

5.1 Team Project

Team projects in an educational setting must balance two concerns: (1) the need for students to work together as cohesive teams, and (2) the need for individual accountability. Thus, half of your project grade will be based on your individual productivity and half will be based on what your team is able to accomplish as a whole.

5.1.1 Individual Productivity

5.1.1.1 Regular Productivity

The majority of your individual productivity points are associated with *regular productivity*. It is expected that each team member will complete his/her assigned tasks in a timely manner. It is also expected that team members will be continuously productive, and not to put off their work until the end of an iteration, and then rush to slap something together. Thus, teams will provide the instructor (aka manager) weekly progress reports.

Individual productivity will be assessed at the end of each iteration. Students who demonstrate continuous productivity throughout the iteration will receive full credit for the iteration. Students who do not will lose productivity points.

5.1.1.2 Above and Beyond Productivity

To achieve the highest grades in the course (A/A+), you will need to go above and beyond the call of duty; thus, your individual productivity grade also accounts for *above and beyond productivity*. For each iteration, you can negotiate A&B tasks to do in addition to your regular task assignments. Each A&B task typically earns 1 point. You may negotiate A&B tasks with me at any time. You can earn as many A&B points as you can negotiate with me, but note that you will need at least 5 above-and-beyond points to get full credit. The work you do for A&B points must be of good quality (a slightly higher quality standard than regular work). I may require you to fix A&B work that does not meet this standard.

5.1.1.3 Additional Productivity Policies

- **Leader Reward:** Because the role of team leader comes with extra responsibilities, a student who serves as leader will earn 1 A&B point for each full iteration they play the role.
- **Milestone Deduction for Unproductiveness:** A student who demonstrates unsatisfactory productivity during an iteration will also lose points on the milestone. This deduction is meant to account for the lack of contribution made by an unproductive team member to the project.
- **Unfinished Tasks:** If a team member fails to finish his/her regular work for an iteration, that unfinished work will go back in the pool of work to be done in the next iteration. Unfinished regular work may make a good candidate for A&B work in the next iteration; however, you will have to negotiate such an arrangement with me. Additionally, a team member can abandon their regular work during an iteration (by contacting me; of course they will lose regular productivity points), making the work available as possible A&B work for other team members.
- **Late Work:** You are expected to complete work on schedule, as deadlines are a part of the real world. Work will not be accepted late unless there are extenuating circumstances and prior arrangements are made with me.
- **Working Together:** Team members may work together however they see fit; however, each team member is responsible for his/her own assigned tasks, and he/she is the only one who can receive productivity credit for those tasks. So collaborate, but be careful about spending too much of your time on someone else's tasks if you're not getting any help on your tasks in return. Note that even though you're working in teams, plagiarism is still strictly forbidden (see below).

5.1.2 Milestones

Teams will receive one grade for each milestone. Milestones will be evaluated based on criteria, which include the following:

- Quality of artifacts and presentation
- Satisfaction of the customer with the work performed

5.2 Homework

There will be occasional homework assignments that you must complete. These will have hard deadlines, and late submissions will not be accepted.

5.3 Major Field Test

All CS majors must take the Major Field Test before they can graduate. It is a standardized test (similar to the GRE and SAT) that is administered by computer in a controlled lab environment. The primary purpose of the test is to help the CS Department assess how well our students are learning the material in the CS curriculum. The test covers a variety of CS subjects, and is described in more detail here:

http://www.ets.org/mft/about/content/computer_science

For students wishing to study for the test, the best advice I can offer is to look at the subjects to be covered (listed at the above website), and review the relevant material from the CS courses you've taken.

5.4 Participation

Students are expected to

- arrive on time to class,
- stay until the end of class, and
- participate in the middle.

You will begin the semester with 13 participation points. If I notice that you are missing from class at any time, I will deduct 1 point for that day. At the end of the semester if you have 10 or more points, then you will receive full credit for participation (i.e., you can miss 3 days without penalty); otherwise, you will receive a percentage of your points out of 10 for participation.

Be forewarned:

- I take attendance at the beginning of class.
- I like to do lots of in-class activities, so the odds of me noticing your absence on a given day are pretty good.

6 Plagiarism/Cheating

Plagiarism or cheating behavior in any form is unethical and detrimental to proper education and ***will not be tolerated***. All work submitted by a student (projects, programming assignments, lab assignments, quizzes, tests, etc.) is expected to be a student's own work. The plagiarism is incurred when any part of anybody else's work is passed as your own (no proper credit is listed to the sources in your own work) so the reader is led to believe it is therefore your own effort. Students are allowed and encouraged to discuss with each other and look up resources in the literature (including the internet) on their assignments, but ***appropriate references must be included for the materials consulted***, and appropriate citations made when the material is taken verbatim.

If plagiarism or cheating occurs, the student will receive a failing grade on the assignment and (at the instructor's discretion) a failing grade in the course. The course instructor may also decide to forward the incident to the University Judicial Affairs Office for further disciplinary action. For further information on U of M code of student conduct and academic discipline procedures, please refer to: http://www.people.memphis.edu/~jaffairs/.