Software Engineering Laboratory

Bulletin Description
Organization and scheduling of software engineering projects, structured programming, and design. Each team designs, codes, and debugs program components and synthesizes them into a tested, documented program product.

General Course Info
Term: TERM FALL 2015
Department: COMP
Course Number: 523
Section Number: 001

Time: MWF, 1:25-2:40
In addition, there will be weekly team meetings with the professor and the client
Location: FB 007
Website: http://wwwx.cs.unc.edu/Courses/comp523-f15

Instructor Info
Name: Diane Pozefsky
Office: FB 146
Email: pozefsky@cs.unc.edu
Phone: 919 590-6117
Web: http://www.cs.unc.edu/~pozefsky
Office Hours: Open Door Policy

Textbooks and Resources
There are no required or recommended textbooks. Sakai will be used primarily for the returning of comments and grades and for submitting individual essays. Weekly process grades and comments will be on a google document shared with the team. All team deliverables will be submitted through the team’s website. All recommended or required readings will be available or referenced on the class website. All required external resources will be available without cost.

Course Description
The goal of this course is to teach the skills necessary for building a software product as a team. The lecture portion of the class will cover the broader picture of software engineering that includes a wide range of software development projects in terms of size, complexity, and criticality. The course carries EE (experiential education) and CI (communications intensive) tags and is an APPLES course.
Target Audience
This course is intended for upper class majors with an interest in building software for practical use. Students are expected to have enough experience to be able to learn new software systems on their own and to design a system using techniques and principles learned in other courses. This is an ideal course for those interested in getting real world experience in building software and communicating with others.

Prerequisites
COMP 410 and 411 plus two additional COMP courses numbered 426 or higher. The additional two courses will ideally cover software tools, techniques or principles. (We are in the midst of defining an explicit set of courses that may be used for this prerequisite. This constraint will not be enforced until it has been officially added, but the proposed courses are those that enhance your ability to learn new technologies.

Goals and Key Learning Objectives
At the end of the course, each student will have experienced all aspects of a software development project, including:
- working with a client to define goals and priorities
- designing a system
- scheduling and planning a multi-person project
- effective communications
- running meetings
- writing technical documentation
- preparing web content
- writing and testing code
- deploying the system
- public presentations

Disclaimer
The professor reserves to right to make changes to the syllabus, including assignment and project due dates. These changes will be announced as early as possible and will be reflected on the course website. If there are discrepancies between this syllabus and the website, the website is considered the definitive information.

Course Requirements
The essence of the course is the faculty-coached team project. Teams of 2-4 students spend the semester negotiating, estimating, scheduling, specifying, coding, debugging, integrating, documenting and testing a substantial programming product. Each project has a real client that is expecting a completed project. Each document will be submitted to the professor in draft form and will be revised based on comments. In addition, documentation needs to be maintained to reflect changes in the product that is being produced.
There will be no written exams; there will be individual assignments given to cover the key concepts of the course that are not well reinforced through the project and to expose you to the literature in the field.

There are a lot of new things happening in the field of software engineering that you are not exposed to within the department's curriculum. Each team will present a technology that they are using that has not been taught in other classes. If there is no appropriate technology the team is using, the team and instructor will select an appropriate technology. Teams will give a 30-35 minute presentation to the class. Preparation for the presentation includes two required meetings with the instructor: a discussion about what is going to be covered two weeks before the presentation and a walkthrough at least 48 hours before the presentation. Topics will be selected significantly before the presentations in order to schedule an appropriate order.

There is a lot of material that needs to be covered early in the semester and there are a lot of disruptions to the standing calendar. Therefore, the course will meet on Fridays early in the semester. In exchange, fewer classes will be scheduled toward the end of the semester. Exact dates of class meetings are reflected on the class calendar and will be adjusted based on instructor availability and university/department conflicts.

Project grades are based on code, documentation, ambition, effort, teamwork, and accomplishment.

The final exam is a presentation of the end product and is scheduled according to the university calendar for Monday, December 7 at noon. It will be held in FB 007.

**Key Dates**

Project demos will be October 5-7 and November 4. Essays will be due September 27, October 25 and November 22. Key documentation deliverables for the projects are

- the functional specification, due September 14
- test plan, October 9
- user manuals and design documentation, due December 7.

December 7 is also the day that the final code is due and the final presentation given. Initial versions of these documents are due earlier.

I will be scheduling a time when I am doing the final testing of each project. At least one team member will be present when I do the testing. This avoids the problem where a small bug prevents me from testing the bulk of the function or a poor user interface leaves me befuddled.

**Grading Criteria**

*Overall breakdown*

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Project</td>
<td>75%</td>
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<tr>
<td>Technology talk</td>
<td>15%</td>
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<tr>
<td>Essays</td>
<td>10%</td>
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**Project**
I compute a single grade for the project, based on the following percentages:

- Process 25%
- Code 25%
- Documentation 20%
- Final Presentation 5%

I then apply an individual contribution multiplier for each person. This value is based on my observations as well as the evaluations by your client, any consultants, and your peers. The multiplier ranges from .7 to 1.1, but a value above 1 is only used in exceptional cases. Basically, I do not believe that you should be able to get a better grade than the product you produced and taking on more than your share is not always a sign of a good team member.

A few more details:

- **Process** includes whether you are interacting appropriately as a team, with me, and with your client. Are you addressing issues as they arise? It includes professionalism in your dealings with your client and your professor and whether you are usually on time with deliverables or habitually late. It includes your web site and the materials that you produce as steps to produce the other artifacts. I will be giving you process grades every week. You will receive individual and team grades. Key considerations for the grade are whether you meet your milestones, you are adapting your process as you learn, and whether you are working well as a team. You will be graded on a weekly basis, so the final grade will not be a surprise.

- **The code grade** covers function, correctness and readability. The three components are equally important. Have you met the primary requirements? How many bugs was I able to find? I will do a random review of the code that you produce. I expect to be able to understand it. This includes web pages as well as other code that you write.

- **The documentation** covers the formal deliverables: the functional spec, the design document, the user manuals, and the test plan. They are weighted equally. Remember that spelling, grammar, and readability are important; unreadable good content is not sufficient. Interim deliverables are part of the process grade.

- **For the final presentation,** your grade will include both content and style.

**Technology Talk**
Your grade will include both content and style. I will be looking to see if you understand what you are presenting and whether you are communicating well with your classmates.

**Individual Assignments**
There will be three essays assigned. The intent is to introduce you to the classic literature of the field. Grading will be based on the demonstration of understanding the content, reasonable proofing, and following instructions.
Course Policies

Attendance: While attendance is not taken in class, I expect student attendance at all peer presentations. Specifically, I expect you to be at all technology talk and demo presentations. For other classes, I only point out that there is no textbook in this class because the content is not available in any simple form. If you are interested in the content, you need to listen to lectures. We also have a number of outstanding not-to-be-missed outside speakers during the class.

The course final is given in compliance with UNC final exam regulations and according to the UNC Final Exam calendar.

Honor Code

Collaboration and peer-learning are necessary for team projects. Only the individual assignments are not to be done collaboratively. These are open book, open notes, and open network. My goal is to give you essays that require individual thought and reflection and the work must be that of the student. Directly taking text from other sources is not acceptable. Short excerpts from other sources may be quoted and properly cited.
Course Schedule

The following is a draft of the class schedule. The up-to-date schedule is posted on the web site. This schedule only covers class lectures, not assignment deliverables, which are detailed on the web site.

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<thead>
<tr>
<th>Date</th>
<th>Lecture/Activity</th>
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<th>Lecture/Activity</th>
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<tbody>
<tr>
<td>Aug 19</td>
<td>Introduction</td>
<td>21</td>
<td>Communicating with Clients</td>
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<td>24</td>
<td>Client Presentations</td>
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<td>Client Meetings</td>
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<td>31</td>
<td>Software Engineering Processes</td>
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<td>Software Engineering Processes</td>
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<td>Sept 3</td>
<td>Personas, User Stories, Requirements</td>
<td>5</td>
<td>Use cases, Functional Specs</td>
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<td>9</td>
<td>Architectures and Design</td>
<td>14</td>
<td>No Class</td>
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<td>16</td>
<td>Platforms and Development Tools</td>
<td>21</td>
<td>Project management and Scheduling</td>
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<tr>
<td>23</td>
<td>No Class</td>
<td>25</td>
<td>Cloud Computing and Deployment</td>
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<td>28</td>
<td>User Interfaces and HCI</td>
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<td>Testing</td>
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<td>Oct 2</td>
<td>Accessibility</td>
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<td>30</td>
<td>Demonstrations</td>
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<td>Nov 2</td>
<td>Tech Talks</td>
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<td>9</td>
<td>Guest Speaker</td>
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<td>Guest Speaker</td>
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<td>16</td>
<td>Guest Speaker</td>
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<td>Security and Privacy</td>
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<td>Thanksgiving</td>
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<td>Work Environments</td>
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<td>Dec 7</td>
<td>final presentations</td>
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Last updated 8/28/2015