

CMSC 838P: Research in Software Engineering

Instructor: Vibha Sazawal

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Contact information Email me at vibha@cs (include "838P" in your subject line)

Time TuTh 11:00am to 12:15pm, CSIC 3118

Sub area Software Engineering and HCI

Comps PhD qualifying; MS qualifying; MS comp: Final

1 What is software engineering research?

All software begins with an idea. Software engineering is the theory and practice of taking that idea, creating software, and then maintaining that software as ideas and users evolve. Software engineering research aims to understand and improve the software engineering process.

Have you worked with code that degraded over time? Code that no one understands? Code with too many bugs from the very beginning? Different programs that should work together nicely yet somehow don't? Software engineering researchers search for solutions to these and other problems, via new methods and tools.

How is this course organized?

This course is an introduction to software engineering research that emphasizes software design. We will survey software engineering topics using an idealized software engineering process as a template. This process includes: determining what the software is supposed to do, designing and implementing software, testing and inspecting software, and handling change.

At the end of the semester, we'll look at exciting new areas of research: aspects and modularity, DSMs, application of real options theory to software engineering decision making, software evolution analysis, and more.

2 Who should take this course?

Everybody! This course will be a great introduction or opportunity to reflect on the field of software engineering research. The course content will be useful to anyone who intends to build research or production software. There will be flexibility with course project topics.

3 Background reading

Is your undergraduate software engineering background rusty? I recommend the following books as background material. Please note that I won't assign any reading from these books directly; I just list them here

as a reference in case you are not familiar with software engineering topics such as use cases, unit testing, and UML.

- *The Pragmatic Programmer* by Hunt and Thomas
- *UML Distilled* by Fowler
- *Design Patterns* by Gamma et al. or *Head First Design Patterns* by Freeman et al.

4 Will I learn about X if I take this class?

The reading list provides a good synopsis of what the class will cover.

There is an opportunity, however, to explore additional topics with your course project. Please email me if you have specific ideas. I'm flexible when it comes to project topics. In particular, software engineering can be easily combined with other fields of computer science. For example, a data mining student could work on mining software repositories, or a graphics student could work on a software engineering problem that is prevalent in graphics code.

5 Grading

5.1 Participation: 20%

I expect you to contribute to class discussions. Specifically, your comments should help us understand the accomplishments of past software engineering research and the problems that remain to be solved. By the end of the class, I should remember your contributions to class discussions and have confidence in your ability to discuss software engineering research intelligently.

5.2 Assignments: 30%

Assignments will involve reviewing or summarizing the reading. I suggest that you read the "Guide to Reviewing and Summarizing Readings in 838P" (available online) so that you complete assignments correctly. Please turn in assignments via email before the start of class.

Communication is a crucial aspect of research. If no one understands your ideas, then effectively your ideas don't exist. As a result, I will not accept poor writing. Please take your writing very seriously.

5.3 Exam: 20%

I will give a take-home final exam at the end of the semester. The exam will ask you to read a set of papers and answer questions.

5.4 Project: 30%

You will complete a project individually or in pairs. At the end of the week 3, you will submit a project proposal. Assuming the proposal is accepted, at the end of week 7 you will submit a progress report. At the end of week 11, you will submit another progress report. At the end of the semester, you will make a presentation and submit a report.

6 Absences and accommodations

Let me know as soon as possible if you will ever miss class. You will be responsible for all material covered in class. If you're absent due to illness, please get a note.

Students with disabilities should inform me of their needs immediately.

7 Academic integrity

A message from the Student Honor Council:

"The University of Maryland, College Park has a nationally recognized Code of Academic Integrity, administered by the Student Honor Council. This Code sets standards for academic integrity at Maryland for all undergraduate and graduate students. As a student you are responsible for upholding these standards for this course. It is very important for you to be aware of the consequences of cheating, fabrication, facilitation, and plagiarism. For more information on the Code of Academic Integrity or the Student Honor Council, please visit <http://www.studenthonorcouncil.umd.edu/whatis.html>."

A message from the instructor:

"I pity the fool who tries to cheat in my class."