Syllabus for CprE 556 - Scalable Software Engineering
Spring 2011

Suresh Kothari, kothari@iastate.edu, Office: 3132 Coover, Phone: 294-7212
Office Hours: Tue 4:30 to 5:30 & Thurs 11 to 12

Prerequisite: CS/CprE 309 or extensive experience in developing software.

This course is about awareness and knowledge that industry should have in its workforce to develop and evolve reliable software efficiently. The course will focus on software engineering techniques and practices that can scale well to large-scale software projects. The course will provide insights into problems industry faces and it will introduce the emerging software automation technologies to address those problems.

Software has become a critical part of airplanes, automobiles, pacemakers, consumer electronics, communication systems, energy systems, and many other embedded systems. A part of the course will be about domain-specific software engineering which is a growing trend in industry.

Good solutions to real-world software engineering problems require an understanding of not only engineer's perspective but also the manager's perspective on the economics of producing and maintaining software. Both the perspectives will be discussed.

For hands-on experience of scalable software engineering, we will use examples drawn from Linux kernel and other real-world software. These examples will present the complexity that is too difficult to handle manually and so we will introduce automation tools that are extremely helpful for analyzing and visualizing complex software.

Note: A separate outline will be given to describe the topics covered in the class. There is no text book. We will cover material from several books, papers, and Internet sources. The material will be summarized in lecture notes.

We will have all together 400 points of which 30 points will be for doing consistently exemplary work throughout the semester and contributing to discussions. The remaining 370 points will be divided between homework and projects. Expect the grading scale to be: A: 91-100, B: 81-90, C: 71-80, D: 61-70 and F: 0-59 Typically, projects will involve analyzing and understanding software to perform tasks such evaluating its design, defining requirements for evolving it, analyzing defects, validating software etc. The emphasis will be on developing problem solving and critical thinking skills.

You are expected to provide well organized professionally written homework and project report reports. In addition to the technical content, the overall quality and readability of the report will be important. You should provide appropriate references if you are using material from Internet or other sources.

Submissions will be through the WebCT site. The deadline for each assignment will be on the handout. It will typically be Wednesday for on-campus students and the following Sunday for off-campus students. Follow the submission deadlines to avoid late penalty.

Expectations and Policies: Attendance is mandatory for on-campus students. Participate in discussions. Check the course website (WebCT) regularly. Read the lecture notes. Read the homework and project assignment and ask questions immediately if you have doubts; you may not get timely answers the closer it gets to the deadline. Whenever possible ask questions in class or talk to me during my office hours. Make an appointment if you need to see me outside the office hours. If you have a learning disability that makes it difficult for you to understand the lectures or perform the required work, inform me. We will try to accommodate any special needs.

Demos: Sometimes it will make sense for you to prepare demos to accompany your homework or project. For example, the home work may be about evaluating a tool and you can prepare a demo to show how the tool works. You can use the Wink tool to prepare a demo.
A tutorial on Wink is at: http://www.debugmode.com/wink/

Software Engineering Journals and Conferences: http://people.engr.ncsu.edu/txie/seconferences.htm
You will find here information about software engineering conferences and journals.

Electronic Library: http://www.lib.iastate.edu/collections/db/ieeexx.html. Use the ISU digital library to get ACM and IEEE journal and conference papers. You need to be logged into your ISU account to use the electronic library. Suppose you get following reference after searching on Google http://portal.acm.org/citation.cfm?id=837837 . By clicking on this link you will find that the paper has appeared in International Workshop on Program Comprehension (IWPC) in 2006. Click on the Xplore link, click on conferences, type IWPC in the search box and go. You will get a yearly listing of all IWPC proceedings. Click on the appropriate year, the Table of Content comes up. Click on the PDF link for the paper.

Problems with WebCT: Send mail to the Engineering Distance Education. Email: edehelp@iastate.edu. URL: http://www.ede.iastate.edu/