

CS 442 - Software Engineering I - 3 Credit Hours

Textbook:

Software Engineering Fifth Edition, by Sommerville, Ian, Addison-Wesley, 1996.

The Mythical Man-Month Anniversary Edition, by Frederick P. Brooks, Jr., Addison Wiley, 1995.

Alternate References:

Highly Recommended for Group Project:

The Essence of Structured System Analysis Techniques, by G. Griffiths Prentice Hall Europe 1998

Supplemental:

Software Engineering: A Practitioner's Approach, by Pressman, R., McGraw-Hill, 1996.

Software Engineering with B, by Wordsworth, J.B., Addison-Wesley, 1997.

Software Architecture, By Shaw, M., and D. Garlan, Prentice Hall, 1996.

Software Requirements: Objects, Functions and States, By Davis, A., Prentice Hall, 1993.

Other reference material may be presented in class (for which the student is responsible).

Textbook Coverage and Supplemental:

Chapters 1 – 3 – Introduction

Chapters 4 – 8 – Requirements Modeling, Analysis and Specification

Chapters 9 – 11 – Formal Software Specification

Chapters 12 – 15 – Software Design

Chapters 16, 19 - 21 – Real-Time Systems

Chapters 22 – 23 – Verification and Validation

Chapters 25 – 27 – CASE

Plus supplemental materials and readings as required by the instructor.

Course Objective and Description:

Introduction to software systems development with emphasis on requirements analysis, specification, design, implementation and testing (unit and integration), and finally demonstration. Students will participate in a course project to give them hands-on experience with software engineering principles. There will be documentation (including the appropriate artifacts) required as exit and entrance criteria to each phase of the process. The objective is to experience a particular method for the systematic development of large software systems from reusable fragments (when possible in the classroom setting) that are an essential part of software engineering. All course material provided is available from <http://www.eecs.wsu.edu/~cs422> home page or from the instructor's home page.

Topical Outline:

<i>Topic</i>	<i>Reference (Chap)</i>	<i>Lectures</i>
1. Course introduction and objectives including the syllabus, an overview of some general and important topics (i.e., software reliability engineering) as well as the project initiation	Video and see the course web page	3
2. Introduction to software engineering: systems engineering, project management and requirements engineering and analysis	1 – 5, 7, 8	9
3. Formal software specification including algebraic and model based techniques	9, 10, 11	6
4. Software architecture and design including object and function oriented, real-time and user interface design	17, 12 – 16	9
5. Dependable systems including software reliability, programming for reliability, reuse and safety-critical systems	18 – 21	6
6. Verification and validation, defect testing, and computer aided software engineering (CASE, as time permits)	22, 23, 25 – 27	9
7. There will be outside reading assigned as follows: Are We Testing for True Reliability (by D. Hamlet); SRM Theory to Practice article (by F.T. Sheldon); the Toward a Discipline of Software Engineering article (by Anthony I. Wasserman); The Mythical Man month (by F. P. Brooks) and possibly others.		2 – 3 inter- spersed
Total (2 lectures used for in class exams, final exam is 8:00a-10:00 Wed. 12/15/99)		45

Learning Outcome and Assessment:

- There will be (closed book/notes) 2 regular class period exams plus a comprehensive final exam.
- There will likely be 4-7 homework assignments. Quizzes are possible but not likely (unless I see that people are not keeping up). Study questions for the material to be covered by the exam will be provided.
- Questions on the exams will cover material from both the homework and any outside reading assignments (i.e., readings in the Mythical Man Month, or papers handed out). It is likely that questions straight out of previous exams will be asked (10-15%), and does not apply to the first exam.
- Extra credit for outstanding contributions to projects as well as an extra credit question (or two) on the exams will be awarded. Don't be surprised.
- This class is a lot of work. If you have a full time job and more than one other Computer Science class then I suggest that you drop either this class (or the other) now and not later when it may hurt you. *In fact, if you do not come and talk to me in such a case to get my permission then you unofficially do not have my permission to take this class.* This is partly because it is not fair to your team mates if you never have the time to either meet with them or to cover your end of the deal with respect to the project.

Grading Distribution and Criteria

2 Mid-term (In-class) examination	25%
1 Final (In-class) examination	20%
1 Term project (PJ)	
• Deliverables	40% (times the PE-factor [PENavg = ((PE1 + PE2 + PE3)/3)*20])
• Status reports (emailed wkly)(5%)	
• Software requirements spec. (5%)	
• Design notebook (5%)	
• Test rpt. (incl. traceability) (5%)	
• User manual (5%)	
• Preliminary design review (5%)	
• Critical design review (5%)	
• Demonstration (5%)	
• Peer evaluation	Described on a separate handout (PE-factor)
Homework (H)	05%
Quizzes (Q)	05%
Attendance / Discretionary	05%
<hr/> Total	<hr/> 100%

$$\text{Final Grade} = 0.1*HQ_{\text{avg}} + 0.4*PJ_{\text{avg}}*(PEN_{\text{avg}}/100) + 0.125*Ex1 + 0.125*Ex2 + 0.2*Final + 0.05*Discr$$

All grades are based on a decade scale from 0-100 as follows:

90-100 = A	A linear shift (known as curving) may be applied to the final grade averages
80-89 = B	as a one-time scale at instructors discretion. Plus and minus grades may be
70-79 = C	given out on the final course grade at the instructors discretion. Note, a
60-69 = D	grade of 'C' (or lower) is considered failing for graduate students.
< 60 = F	

Student Peer Evaluation of Project Participation

Ratings (0-4): 4 = excellent (A), 3 = good (B), 2 = fair (c), 1 = poor (D), 0 = completely failed

Evaluation Categories:

1. Meetings attendance. and timeliness (e.g., delivers work when promised).
2. Participation (e.g., contributes ideas, direction and takes responsibility).
3. Quality of personal deliverables (e.g., above average, average, sloppy, sloppy and no work).
4. Initiative (e.g., offers ideas and takes action, tries to solve problems, researches alternatives).
5. Responsiveness (e.g., to emails, phone calls and personal communications and deadlines).

General Conduct Policies and Grading Standards

Policy On Discretionary Points

Discretionary points, based on your conduct and participation in the class, will be assigned. Actually, my mission is your success. I am not here to defeat you but rather to help propel you to the next level. However, disorderly or disruptive conduct (e.g., asking questions by raising your hand is reasonable and encouraged, but insisting I answer a question that I have acknowledged and have either deferred to a later date or that I deem unimportant to the goals of the class is not), lack of attendance (especially chronic) without reasonable justification (work related absence is tolerable up to a point) are both examples where the student should expect to lose discretionary credit. As a courtesy, you should try to inform me by email that you will not be coming to class. I expect to be treated as a professional on a professional level (i.e. as you would treat your employer). If you have a problem or are confused with something I am doing or are asking you to do in the context of this class then lets try to resolve it as professionals face to face. I do not return phone calls between your meetings at work. In fact, most of the time its more convenient for me to answer emails. But that is not always the case and people too busy to see me during my office hours or otherwise (I am very accessible almost anytime) are really too busy to be taking this course. I say this because its sometimes very inefficient to work problems out completely using email. All of this, and in this general area of conduct, falls under the heading of discretionary credit. Students should expect to be judged accordingly.

Policy on Missed Exams

Absolutely no makeup exams are given without prior authorization or written proof (or its equivalent) that the student was prevented from participating. Unexcused missed exams result in a grade of zero for the exam. Excused absences from exams include: (1) personal emergencies, (2) work-related (with confirmation letter). Taking an exam early may be possible for *unavoidable*, planned absences.

Cheating on Exams or Homework

Absolutely no cheating on exams or projects and homework will be tolerated. Students are encouraged to discuss concepts for homework (individually and in class); however, each student is expected to develop his or her own solutions. For further details on academic honesty the student is referred to the Student Handbook.

Class Attendance

Class attendance is not required (but may count towards your total grade in terms of the discretionary points you are assigned), and you are 100% responsible for all material (and announcements) presented in class. A class attendance sheet will be passed out at the beginning of each class and you are required to initial it.

Late Drop

Dropping of a class after the deadline listed in the class schedule is governed by departmental and college policy. The student must show documented evidence supporting reasons for a request to drop a class after the deadline. Each request is considered on an individual basis for determining acceptance.

Office Hours:

Typically I will be available after the class meets, or by appointment. Official office hours for this are posted at my office or check my home page at URL: <http://www.eecs.wsu.edu/~sheldon>. Other modes of communication with me will also be announced -- e-mail (preferred), voice-mail, etc.

Standards and Grading Criteria for Computer Projects and/or Homework:

- Homework must be clearly presented and complete. Do not turn in scratch work (or multiple attempts).
- Homework that is not software will not be accepted after the due date.
- Homework is due at the beginning of class (not accepted later) on the due date.
- Your solutions must be clear, effectively organized, and effectively presented. Show the major logical steps in achieving a solution. Do not turn in pages with irrelevant scratch work or marked-through work.
- Questions about solutions to problems are encouraged, but may have to be handled individually since class time is at a premium.
- Check the course web page for project requirements (and schedule), documentation standards, and tailoring guidelines for the IEEE standards. Example artifacts from prior class projects are available in the library.

Teaching Assistant: Anthony (Tony) Keen (EME 35 – akeen@eecs.wsu.edu) Office hours 3-4p (and by appointment)

Teaching Assistant: David Dugan (Office TBA – dsdugan@wsu.edu) Office hours by appointment