

## CS 531 - Software Requirements Analysis and Specification - 3 Credit Hours

### Textbook:

*Requirements Engineering: Processes and Techniques* by Gerald Kotonya / Ian Sommerville, (Wiley) Sept. 1998  
*Requirements Engineering: A Good Practice Guide* by Sommerville, Ian and Sawyer, Pete (Wiley) 1997.

### Alternate References:

Highly Recommended for Group Project:

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

Supplemental:

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

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

*201 Principles of Software Engineering*, By Davis, A., McGraw-Hill, 1994.

*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:

Requirements Engineering Processes and Techniques:

Chapters 1 – Introduction

Chapters 2 – Requirements Engineering Process

Chapters 3 – Requirements Elicitation and Analysis

Chapters 4 – Requirements Validation

Chapters 5 – Requirements Management

Chapters 6 – Methods

Chapters 7 – Viewpoint Oriented Methods

Chapters 8 – Non-Functional Requirements

Chapters 9 – Interactive System Specification

Chapters 10 – Case Study

Requirements Engineering A Practice Guide:

Chapters 1 – 2 – Introduction and Practical Process Improvement

Chapters 3 – 4 – Requirements Document and Elicitation

Chapters 5 – Requirements Analysis and Negotiation

Chapters 6 – Describing Requirements

Chapters 7 – 8 – System Modeling and Validation\*

Chapters 9 – Requirements Management

Chapters 10 – Requirements Engineering for Critical Systems\*

Chapters 11 – System Modeling with Structured Methods\*

Chapters 12 – Formal Specification

Chapters 13 – Viewpoints

### Course Objective and Description:

Students participate in a project involving the analysis and specification of a major software. Coverage includes methods, techniques and tools that support various languages, notations and formalizations for composing and evaluating specification properties (unambiguous, completeness, consistency, etc.) Students are evaluated on their project work (initiative, innovativeness, etc.), and oral presentations (scored on individual and team basis using self and objective assessment methods), homeworks and exams. Prerequisite: Working knowledge of modern programming languages, data structures, algorithms and discrete mathematics.

### Topical Outline:

<i>Topic</i>	<i>Reference (Chap) Lectures</i>	
1. Course introduction and objectives including the syllabus, an overview of some general and important topics as well as the project initiation	1	3
2. RE Process, Elicitation, Analysis and Validation	2 - 4	3
3. Management and Methods	5 - 6	6

4. Viewpoint Oriented Methods	7	6
5. Non-Functional Requirements	8	4
6. Interactive System Specification	9	4
7. Case Study`	10	2
Total (1 or probably 2 lectures will be used for in class exam)		28

**Grading Policy:**

- There will be (closed book/notes) two regular class period exam plus a comprehensive final exam (may be a take home).
- There will likely be 4-7 homework assignments. Quizzes are possible but not likely (unless I see that people are not keeping up). I will try to help you study for the exams by giving you study questions or outlines of the material to be covered by the exam. **However, and in general, you are responsible for reading the chapters in the text that I cover in class (the slides I cover are from those chapters).**
- It should be known that I will likely choose to ask (some) questions on the exams that cover material from both the homework's and any outside reading assignments (i.e., papers I hand out). Also, I will likely ask questions straight out of previous exams that you have taken. Obviously that would not apply to the first exam.
- I like to use or award extra credit for outstanding contributions to projects as well as give an extra credit question (or two) on the exams. 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 will hurt you more. **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.** I say this partly because its not fair to your team mates if you never have the time to meet with them or to cover your end of the deal with respect to the project. Refer to the discretionary points policy below

**Student Evaluation Criteria**

2 Mid-term (In-class) examination	30%
1 Final (Take-home) examination	20%
1 Term project	35% (times the pe-factor)
• Deliverables	
• Status reports (Emailed wkly)	(5%)
• Software requirements spec.# 1	(15%)
• Design notebook	(15%)
• Peer evaluation	Described on a separate handout (pe-factor)
Homework and Quizzes	10%
Attendance / Discretionary	05%
Total	100%

$$\text{Final Grade} = 0.1 * Hq_{avg} + 0.4 * PJ_{avg} * (\text{PEN}_{avg} / 100) + 0.125 * Ex1 + 0.125 * Ex2 + 0.05 * Discr$$

$$\text{PEN}_{avg} = ((PE1 + PE2 + PE3) / 3) * 20$$

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

**Policy On Discretionary Points**

- It should be known that I will assign discretionary points based on your conduct and participation in the class. 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, I don't usually return phone calls because 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 University Catalog.

**Class Attendance**

- Class attendance is not required (but may count towards your total grade in terms of the discretionary points you are assigned), EACH STUDENT IS 100% RESPONSIBLE FOR ALL MATERIAL AND ANNOUNCEMENTS COVERED IN CLASS.

**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.cs.uccs.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 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.
- Questions about solutions to problems are encouraged, but may have to be handled individually since class time is at a premium.
- Each problem will be numbered as it is in the text or on assignment sheet (no not attempt to renumber problems).
- Each problem will be stated fully on your solution sheet, including all drawings and diagrams. This includes any sub-parts labeled a), b), etc.
- Make it clear where your solution begins. A recommended format is to label all parts of the problem presentation clearly (e.g., Problem statement, Assumptions, Solution).
- Your solutions must be clear, effectively organized, and effectively presented. Show the major logical steps in achieving a solution. If an answer is obvious by inspection, then so state.
- Do not turn in pages with irrelevant scratch work or marked-through work.
- You should treat your homework assignments with the same pride as you would a proposal to a customer.
- The rules for grading are the following: (1) quarter-credit for stating the problem, (2) quarter-credit for an honest effort at a solution. The rest of the credit is subject to the following rule.
- While grading, I grade one problem at a time (homework and exams). I give the highest score (may not be the maximum) to the best answer and assign scores for the rest based on how well their solution compares with the best. Some problems are less subjective and naturally your answer is simply correct or not.