

**Syllabus**  
**SYST 510 - Systems Definition and Cost Modeling**  
**Spring 2016**

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**Office Hours:** By appointment via Blackboard Collaborate. I am available Monday at 10 am to Friday at 5 pm for student inquiries. During this 5 day period, I will respond to student inquiries within 24 business hours.

**Course Description:** During this course, the Systems Definition phase of the Systems Development Life Cycle will be explored. This phase of the systems engineering effort includes such activities as requirement elicitation, problem analysis, system specification, and system cost estimation. Lectures concerning these topics will be given by the instructor and will be supported by the listed texts. Students will be tested to ensure understanding of material contained within the lectures and the texts. Additionally, students will gain practical knowledge concerning this subject by participating in a group project to create a System Requirement Specification (SRS) and cost estimation of the system to be developed.

The instructor will gauge progress as the course evolves and adjust schedule in coordination with the 2016 cohort as needed.

Conversely, very advanced cohorts may also schedule adjustments. The key concept is remaining open for necessary adjustments throughout the semester. *In coordination with the 2016 cohort, required presentations in this course may also take place "face to face" in accordance with an agreed upon time convenient to all key participants.* Necessary discussions and adaptations relayed in the previous paragraphs will take place throughout the semester.

**Course Hours:** Tuesdays, 7:20 pm - 10:00 PM Innovation Hall 133 (and via ASYNC Distance Learning)

**Text:** Requirements Engineering, Elizabeth Hull; Publisher: Springer, ISBN-10: 1849964041/ ISBN-13: 978-1849964043, Publication Date: October 11, 2010, Edition: 3rd ed.

**Grades:** 50% - group project:  
5% SOW Presentation  
5% SOW Paper  
10% Preliminary SRS Paper  
10% Final Presentation  
20% Final Deliverable  
50% - individual grades:  
25% - exam 1  
25% - cost estimation exam  
Grades are assigned as follows: A= 92 – 100 B = 84 – 91.9 C= 76 – 83.9 D= 68 – 75.9 F= 0 – 67.9

**Exams: Closed book, closed notes, closed neighbor.** Students must obtain a proctor for the exam. Proctoring materials may be found in Blackboard in “Proctoring Materials” to validate proctors and verify the taking of the exam.

**Learning Outcomes:** At the end of this course, students will be able to:

1. understand and realize the importance of requirements engineering
2. prepare descriptions of functional and non-functional requirements in formal and informal notations
3. create low-fidelity models of user requirements of the system
4. understand the costs and risks of the system and their relationship to the rest of the system development lifecycle

### **Group Project**

The Group Project is the focal point of student effort within this course. The groups will be given a separate Collaborate Room where they will be able to meet 24/7. There will be groups of several people assigned by the professor dependent on the number of students in the class. Each group will have two roles: User Group and Requirement Group.

**Beginning User Group Activities:** As a user, the group will formulate a Statement of Work (SOW) that they will pass to their “mate group”. Mate groups will be assigned after the SOW is completed. The 2 groups (User and Mate) will be given a separate Collaborate Room where they will be able to meet 24/7. This room is not the same room as the group room. If students elect a different collaboration tool please inform the instructor.

**Beginning Requirement Group Activities:** Each group will exchange their SOW with their assigned mate group. The SOW that they receive from their mate group will form the basis for their role as a Requirement Group. In this role, they will

- study the SOW they have received,
- elicit requirements from the mate group to develop a Systems Requirement Specification (SRS) including problem analysis and system definition models,
- run individual cost estimations and discuss differences in final presentation
- and document their final SRS

Each member of the group will be required to run an individual cost estimation of the SRS the group creates. This individual run of the model will constitute the second exam

for the course. The group will then run a group cost estimation and make a recommendation to their mate team on cost. The final analysis of the cost estimations will be a comparison of the individual estimations with a discussion of differences in the final presentation. Their mate group will be doing these same functions with the SOW they receive.

**Ending User Group Activities:** After completion of the SRS and cost estimations, the mate groups will again exchange documents: the SRS and the Cost Recommendation. In the User Group role, each group will evaluate the SRS of their mate group. A recommended evaluation strategy will be given to you.

**Ending Requirement Group Activities:** At the end of the semester, each group will present their work. Groups will be required to hand in their final package to the professor including:

- original annotated SOW they wrote,
- preliminary annotated SRS,
- final SRS,
- group Cost Model comparison and Group Cost recommendation, and
- evaluation of Mate Group SRS

In addition, each person in class will be required to do an evaluation of the other members of their group. This assignment will be in Blackboard. This evaluation will be private.

Examples of SOW, SRS and standards for both are in Blackboard.

### **Course Expectations:**

1. Working online requires dedication and organization. Proper preparation is expected every week. You are expected to log in to the course each week and complete the assignments and activities on or before the due dates.
2. Students must check the class announcements in Blackboard on a daily basis for course announcements, which may include reminders, revisions, and updates.
3. It is expected that you will familiarize yourself with and adhere to the George Mason University Honor Code. Student members of the Mason community pledge not to cheat, plagiarize, steal, and/or lie in matters related to academic work. Students must adhere to the guidelines of the Honor Code [See <http://oai.gmu.edu/>].
4. It is essential to communicate any questions or problems to me promptly.

**Online Learning Community:** This online course is taught via Blackboard Courses (Log into <http://mymason.gmu.edu> , select the Courses Tab, and the course can be found in the Course List).

This course is offered completely online. Each week begins on Wednesday and ends on Sunday.

In our online learning community, we must be respectful of one another. Please be aware that innocent remarks can be easily misconstrued. Sarcasm and humor can be

easily taken out of context. When communicating, please be positive and diplomatic. I encourage you to learn more about Netiquette.

The guides for Collaborate may be found at:

<http://coursesupport.gmu.edu/data/upload/StudentsBb%20CollaborateFull%20Participant%20Guide.pdf>

**Technology Requirements:** The technology requirements for this online course are listed below:

**Hardware:** You will need access to a Windows or Macintosh computer with at least 2 GB of RAM and to a fast, reliable broadband Internet connection (e.g., cable, DSL). For optimum visibility of course material, the recommended computer monitor and laptop screen size is 13-inches or larger. You will need computer speakers or headphones to listen to recorded content. A headset microphone is recommended for live audio sessions using course tools like Blackboard Collaborate. For the amount of computer hard disk space required to take an online course, consider and allow for the space needed to: 1) install the required and recommended software and, 2) save your course assignments. For hardware and software purchases, visit Patriot Computers.

**Software:** Web browser (See Blackboard Support for supported web browsers)  
Blackboard Courses (Log into <http://mymason.gmu.edu>, select the Courses Tab)  
Blackboard Collaborate (select from the course menu)

Adobe Acrobat Reader (free download)

Flash Player (free download)

Microsoft Office (purchase)

Note: If you are using an employer-provided computer or corporate office for class attendance, please verify with your systems administrators that you will be able to install the necessary applications and that system or corporate firewalls do not block access to any sites or media types.

**Performance-based Assessments:**

**Grading rubric for the Group Project  
SOW and Final Deliverable Rubric**

<b>Component</b>	<b>Sophisticated</b>	<b>Competent</b>	<b>Less Than Competent</b>
Teamwork (25 Points)	The team worked well together to achieve objectives. Each member contributed in a valuable way to the project. All data sources indicated a high level of mutual respect and collaboration.	The team worked well together most of the time, with only a few occurrences of communication breakdown or failure to collaborate when appropriate. Members were mostly respectful of each other.	Team did not collaborate or communicate well. Some members would work independently, without regard to objectives or priorities. A lack of respect and regard was frequently noted.
Contribution (25 Points)	All requirements and objectives are identified, evaluated and competed.  The deliverable offered new information or approach to the topic under discussion. Likewise, the application is based on stated criteria, analysis and constraints.	All requirements are identified and evaluated but some objectives are not completed.  The deliverable offered some new information or approach to the topic under discussion. The application is reasonable; further analysis of some of the alternatives or constraints may have led to a different recommendation.	Many requirements and objectives are not identified, evaluated and/or completed.  The deliverable offered no new information or approach to the topic under discussion. Few application considerations are analyzed and other factors were ignored or incompletely analyzed.
Subject Knowledge (25 Points)	The deliverable demonstrated knowledge of the course content by integrating major and minor concepts into the response. The deliverable also demonstrated evidence of extensive research effort and a depth of thinking about the topic.	The deliverable demonstrated knowledge of the course content by integrating major concepts into the response. The deliverable also demonstrated evidence of limited research effort and/or initial of thinking about the topic.	The deliverable did not demonstrate knowledge of the course content, evidence of the research effort or depth of thinking about the topic.
Supporting Material (20 Points)	All relevant information was obtained and information sources were valid. Analysis and design considerations were well supported by the information.	Sufficient information was obtained and most sources were valid. Analysis and design considerations were mostly supported by the information.	Insufficient information was obtained and/or sources lack validity. Analysis and design considerations were not supported by the information collected.
Composition (5 Points)	The deliverable was well organized and clearly written. The underlying logic was clearly articulated and easy to follow. Words were chosen that precisely expressed the intended meaning and supported reader comprehension. Diagrams or analyses enhanced and clarified presentation of ideas. Sentences were grammatical and free from errors.	The deliverable was organized and clearly written for the most part. In some areas the logic and/or flow of ideas were difficult to follow. Words were well chosen with some minor expectations. Diagrams were consistent with the text. Sentences were mostly grammatical and/or only a few spelling errors were present but they did not hinder the reader.	The deliverable lacked overall organization. The reader had to make considerable effort to understand the underlying logic and flow of ideas. Diagrams were absent or inconsistent with the text. Grammatical and spelling errors made it difficult for the reader to interpret the text in places.

### Grading rubric for the Group Final Presentation

Component	Sophisticated	Competent	Less Than Competent
Content and Creativity (40 Points)	The presentation contained an abundance of material which clearly related to the main arguments. External research was used to justify arguments or solutions. The presentation of the material was original and presented in a creative way that held audience attention.	The presentation contained material to support the main arguments, but: 1) not all material clearly related to the main arguments; 2) limited external research was used to justify arguments or solutions; and/or 3) the presentation of the material was appropriate, but only somewhat held audience attention.	The audience had to make considerable effort to understand the underlying logical and flow of ideas. Major aspects of the analysis or recommendations were absent. No external research was used to justify arguments or solutions. The presentation lacked creativity and did not hold audience attention.
Coherence and Organization (30 Points)	The thesis, argument and solution were clearly stated and examples were appropriate. The transitions and flow were easy to follow. Slides were error-free and logically presented.	The thesis, argument and solution were clearly stated, but: 1) not all examples were supportive illustrations; 2) the transitions and/or flow were somewhat difficult to follow; and/or 3) slides were error-free and logically presented.	The thesis, argument, solution and examples were not clearly stated. The conclusion was unclear. The transitions and flow were not logical. Slides contained errors and a lack of logical progression.
Speaking Skills and Participation (30 Points)	Team members were poised and had clear articulation. Every team member spoke and participated at a very high and balanced level. Speakers demonstrated good volume, and eye contact. Enthusiasm and confidence was exuded.  The presentation fit into the time allotment.	Team members were mostly audible and/or fluent on the topic, but:1) not all team members spoke and/or participated in a high and balanced level; 2) speakers demonstrated fair volume and/or eye contact was broken with audience; 3) light discomfort with public speaking was exuded; and/or 4) the presentation slightly went time allotment.	Team members were often inaudible and/or hesitant and relied heavily on notes. Speakers made distracting gestures with little or no audience eye contact. A high level of discomfort with public speaking was exuded. The presentation went over the time allotment.

### Student Expectations:

#### Academic Integrity

**The Honor Code will be read and signed by all students the first week of class and submitted in Blackboard. The Honor Code will also be the first page of the exam and must be signed before taking the exam.**

GMU is an Honor Code university; please see the University Catalog or <http://oai.gmu.edu/> for a full description of the code and the honor committee process. The principle of academic integrity is taken very seriously and violations are

treated gravely. What does academic integrity mean in this course? Essentially this: when you are responsible for a task, you will perform that task. When you rely on someone else's work in an aspect of the performance of that task, you will give full credit in the proper, accepted form. Another aspect of academic integrity is the free play of ideas. Vigorous discussion and debate are encouraged in this course, with the firm expectation that all aspects of the class will be conducted with civility and respect for differing ideas, perspectives, and traditions. When in doubt (of any kind) please ask for guidance and clarification.

Students must be responsible for their own work, and students and faculty must take on the responsibility of dealing explicitly with violations. The tenet must be a foundation of our university culture. [See <http://oai.gmu.edu/students-responding-to-alleged-violations/distance-learners/> ].

### **MasonLive/Email (GMU Email)**

Students are responsible for the content of university communications sent to their George Mason University email account and are required to activate their account and check it regularly. All communication from the university, college, school, and program will be sent to students solely through their Mason email account. [See <https://masonlivelogin.gmu.edu/login> ].

### **Patriot Pass**

Once you sign up for your Patriot Pass, your passwords will be synchronized, and you will use your Patriot Pass username and password to log in to the following systems: Blackboard, University Libraries, MasonLive, myMason, Patriot Web, Virtual Computing Lab, and WEMS. [See <https://password.gmu.edu/index.jsp> ].

### **University Policies**

Students must follow the university policies. [See <http://universitypolicy.gmu.edu> ].

Responsible Use of Computing Students must follow the university policy for Responsible Use of Computing. [See <http://universitypolicy.gmu.edu/policies/responsible-use-of-computing/> ].

University Calendar Students must follow the university policies. [See <http://registrar.gmu.edu/calendars/> ].

### **Students with Disabilities**

Students with disabilities who seek accommodations in a course must be registered with the George Mason University Office of Disability Services (ODS) and inform their instructor, in writing, at the beginning of the semester [See <http://ods.gmu.edu> ].

### **Student Services:**

#### **University Libraries University**

The Mason library provides resources for distance students. [See <http://library.gmu.edu/distance> ].

#### **Writing Center**

The George Mason University Writing Center staff provides a variety of resources and services (e.g., tutoring, workshops, writing guides, handbooks) intended to support students as they work to construct and share knowledge through writing. [See <http://writingcenter.gmu.edu> ]. You can now sign up for an Online Writing Lab (OWL) session just like you sign up for a face-to-face session in the Writing Center, which means YOU set the date and time of the appointment! Learn more about the Online Writing Lab (OWL) (found under Online Tutoring).

### **Counseling and Psychological Services**

The George Mason University Counseling and Psychological Services (CAPS) staff consists of professional counseling and clinical psychologists, social workers, and counselors who offer a wide range of services (e.g., individual and group counseling, workshops and outreach programs) to enhance students' personal experience and academic performance [See <http://caps.gmu.edu> ].

Family Educational Rights and Privacy Act (FERPA) The Family Educational Rights and Privacy Act of 1974 (FERPA), also known as the "Buckley Amendment," is a federal law that gives protection to student educational records and provides students with certain rights. [See <http://registrar.gmu.edu/privacy> ].



## CLASS SCHEDULE

Week 1>	19 January	<ul style="list-style-type: none"> <li>◆ Lecture: Introduction [Hull Chapter 1]</li> <li>◆ Group work on SOW</li> <li>◆ Individual: Information sheet and Honor Code due by 30 January</li> </ul>
Week 2>	26 January	<ul style="list-style-type: none"> <li>◆ Lecture: Generic Process for Requirements Engineering [Hull Chapter 2]</li> <li>◆ Lecture: Systems Modeling [Hull Chapter 3]</li> <li>◆ Groups: Group Work on SOW</li> </ul>
Week 3>	2 February	<ul style="list-style-type: none"> <li>◆ Lecture: Writing and Reviewing Requirements [Hull Chapter 4]</li> <li>◆ Groups: 10 minute presentation of SOW – submit in Blackboard no later than 1 February</li> </ul>
Week 4>	9 February	<ul style="list-style-type: none"> <li>◆ Lecture: Requirements Engineering in the Problem Domain [Hull Chapter 5]</li> <li>◆ Groups: SOW feedback and Mate Team assignments given no later than 8 February</li> </ul>
Week 5>	16 February	<ul style="list-style-type: none"> <li>◆ Lecture: Requirements Engineering in the Solution Domain [Hull Chapter 6]</li> <li>◆ Lecture: Advanced Traceability [Hull Chapter 7]</li> <li>◆ Groups: Exchange SOW with Mate Group</li> </ul>
Week 6>	23 February	<ul style="list-style-type: none"> <li>◆ Exam Number 1 – Proctor must be arranged by student</li> </ul>
Week 7>	1 March	<ul style="list-style-type: none"> <li>◆ Lecture: Use Cases - Include and Exclude Statements</li> <li>◆ Lecture: Quality (Non-Functional) requirements</li> <li>◆ Return Exam Number 1; Feel free to contact professor with any questions</li> <li>◆ Groups: Work on Preliminary SRS which is due on 14 March</li> </ul>
Week 8>	8 March	<ul style="list-style-type: none"> <li>◆ Spring Break</li> </ul>
Week 9>	15 March	<ul style="list-style-type: none"> <li>◆ Lecture: DOORS</li> <li>◆ Groups: Preliminary SRS due in Blackboard by 14 March</li> </ul>
Week 10>	22 March	<ul style="list-style-type: none"> <li>◆ Lecture: Cost models – COCOMO II</li> <li>◆ Lecture: Review of EAFs</li> <li>◆ Groups: Feedback given on Preliminary SRS by 21 March</li> <li>◆ Final Test Sheet for Take-home Exam (covers Cost Modeling) reviewed</li> </ul>
Week 11>	29 March	<ul style="list-style-type: none"> <li>◆ Lecture: COSYSMO</li> <li>◆ Lecture: Activity Based Costing</li> <li>◆ Lecture: Evaluation of Mate Team Workshop</li> <li>◆ Groups: Exchange SRS with Mate Group</li> </ul>
Week 12>	5 April	<ul style="list-style-type: none"> <li>◆ Lecture: EVMS</li> <li>◆ Individual Cost Models due</li> <li>◆ Groups: Work on Group Cost Model and Mate Group Evaluation</li> </ul>
Week 13>	12 April	<ul style="list-style-type: none"> <li>◆ Lecture: Configuration Management</li> <li>◆ Groups: Work on Final Presentations, Group Cost Estimation</li> </ul>

Week 14>	19 April	<ul style="list-style-type: none"> <li>◆ Groups: Mate Team Evaluation due in Blackboard by 26 April</li> <li>◆ Groups: Final SRS - Paper due in Blackboard by 26 April</li> <li>◆ Groups: Group Cost Estimation due in Blackboard by 26 April</li> </ul>
Week 15>	26 April	<ul style="list-style-type: none"> <li>◆ Student group final presentations</li> <li>◆ Individual: Evaluation of your Team Members</li> <li>◆ Groups: Final Presentations</li> </ul>
Week 16>	3 May	<ul style="list-style-type: none"> <li>◆ Final Exam</li> </ul>