George Mason University
School of Information Technology and Engineering
Department of Systems Engineering and Operations Research
SYSTEMS DEFINITION AND COST MODELING SYST510-001 73034 – Fall 2009
Mondays 7:20pm to 10:00 pm - Location: Engineering Building 4457
Aug 31, 2009 - Dec 21, 2009

Syllabus

Professor: ***Dr. Stephen V. Stephenson***
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Home Page: *http://courses.gmu.edu/* ***or***
https://gmu.blackboard.com/webct/logon/35869625001 (for SYST510 registered students only)

Public Web Site: *http://www.gmu.edu/departments/seor/syllabi/fall09.htm*

Course Description SYST 510 Systems Definition and Cost Modeling (3:3:0). *Prerequisite: Graduate standing.* Comprehensive examination of the methods and processes for the identification and representation of system requirements. Investigation of the systems acquisition life cycle with emphasis on requirements definition, including functional problem analysis. Examination of the systems engineering definition phase including requirements, problem analysis, definition, and functional economics. Specification of functional and nonfunctional requirements, and associated requirements prototyping. Functional economic analysis, including the use of prevailing cost estimation models and planning and control of common operating environments. Lecture and group project including creation of requirements and use of cost estimation model. Case studies of some current U.S. Federal governmental or commercial enterprises are presented. In addition, the professor will discuss topics related to "real-life" project management, enterprise architecture, enterprise integration, systems engineering, enterprise engineering, and some practical issues with solutions from his experience in large scale systems development, operating systems, data communications, computer networks, and distributed systems integration.

GMU Blackboard Learning System (BLS) Requirements BLS usage is required in the class: *http://courses.gmu.edu/* Students need a BLS ID and password to login. Their BLS ID is their Mason mail user name (e.g. the BLS ID for jdoe@gmu.edu would be jdoe) and password is his/her GMU email password. *All assignments have due dates and submissions after the due date/time will not be possible, since* BLS *will automatically block "submit my homework" option*. From time to time, BLS works too slowly. Especially from a dial-up internet connection, BLS access may not be so efficient all the time; students are also encouraged to submit their work via email to me to meet the deadline. If you experience any problem while accessing BLS, please send an e-mail to Dr. Stephen Stephenson, stephen_stephenson@dell.com

Honor Code Honor Code procedures will be strictly adhered. Students are required to be familiar with the honor code. You must not utilize unauthorized material or consultation in responding to your tests, homework, and assignments. There are several web sites that publish homework solutions, project assignment programs, etc. Numerous professors used the homework solutions from the textbook as their standard grading keys and also published the solutions on the Internet. You may use those solutions as references but you are not allowed to copy them directly. Violations of the honor code will be reported. Obvious honor code violations (exact copy of work, etc) will be graded as 0/100 (zero percent).

Textbooks

System Requirements Analysis

Jeffrey O. Grady, Academic Press
ISBN: 978-0-12-088514-5
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A Guide to the Project Management Body of Knowledge: (PMBOK Guide)
Project Management Institute
ISBN: 1-880410-12-5

Grades:	15% - In class participation
	10% - Statement of Work (SOW) (group grade)
	15% - Presentation (group grade 5% SOW and 10% Final)
	15% - Deliverables (group grade)
	20% - Midterm Exam
	25% - Final Exam

The following table is used to convert the final numerical grade to a letter grade:

Grade G	Letter Grade
[97,100]	A
[92,96)	A-
[88,91)	B+
[84,87)	B
[80,83)	B-
[51,79)	C
[0, 50)	F

IMPORTANT NOTE: ***It requires an exceptionally challenging performance to earn 92% or greater***

There will be a group project, group presentation, midterm exam, and a final exam. Students will be formed into project groups. Each group will present two in-class presentations and submit project deliverables.

Group Project

The Group Project is the focal point of student effort within this course. Although groups may be able to meet during class time occasionally, the majority of effort toward the group projects will be expended outside of class. There will be groups of several people self-formed during the first meeting of the class. Each group will have two roles: User Group and Requirements Group.

User Group Activities: As a user, the group will formulate a Statement of Work (SOW) that they will pass to their "requirements group". Requirements groups will be assigned to an assigned requirements group (ARG) after the SOW of a selected user group (SUG) is completed.

Requirement Group Activities: Each SUG will exchange their SOW with their ARG. The SOW 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 requirements group to develop a Systems Requirement Specification (SRS) including problem analysis and system definition models, and
- run cost models based on the developed SRS and document their final SRS.

Each member of the ARG will be required to run a cost model (e.g. COCOMO2, CostXpert, etc.) This individual run of the model will constitute part of the final examination. The final analysis of the cost models will be a comparison of the individual models with a determination by the ARG of the final estimation they submit.

Final User Group Activities: After completion of the SRS and cost models, the ARGs will again exchange documents with their SUG: the SRS and Cost Model document. In the User Group role, each SUG will evaluate the products of their ARG and generate an annotated evaluation document to indicate their SUG performance. A recommended evaluation strategy will be given in class.

Deliverables: At the end of the semester, each group will present their work including the SRS and Cost Models. Groups will be required to hand in their final package to the professor including:

- original annotated SOW they wrote with my corrections,
- final SRS,
- group Cost Model evaluation, and
- evaluation of Requirements Group SRS and Cost Models.

In addition, each person in class will be required to do an evaluation of the other members of their group. The format of this is contained in a separate handout. This evaluation will be private. It should be included in a sealed envelope with student signature across flap **as part of the final package**.

SCHEDULE

Week 1	Aug. 31	♦ Handout syllabus, Honor Code, BLS ♦ Groups: Form Groups, Work on SOW ♦ Lecture - Introduction
Week 2	Sept. 7	♦ **Labor Day, university closed**
Week 3	Sept. 14	♦ Lecture: System Requirements Analysis (Grady Parts 1 and 2) ♦ Groups: Work on SOW ♦ Lecture: Integration Management
Week 4	Sept. 21	♦ Lecture: System Requirements Analysis (Grady Part 3) ♦ Groups: Work on SOW ♦ Lecture: Scope Management
Week 5	Sept. 28	♦ Lecture: System Requirements Analysis (Grady Parts 3, 4) ♦ **Groups: SOW (via BLS) due to professor** ♦ **Groups: presentation of SOW** ♦ Lecture: Time Management
Week 6	Oct. 5	♦ Lecture: System Requirements Analysis (Grady Parts 3, 4) – Modern Topics ♦ **Groups: SOW returned; Requirements Group assignments given;** ♦ Lecture: Cost Management
Week 7	Oct. 12	♦ Lecture: System Requirements Analysis (Grady Part 5) ♦ Modern Topics ♦ Groups: Requirements elicitation & SRS writing ♦ **Bring copy of SOW to class to give to your Requirements Group** ♦ Lecture: Quality Management
Week 8	Oct. 19	♦ Lecture: System Requirements Analysis (Grady Part 6) ♦ Groups: Requirements elicitation & SRS writing ♦ Lecture: Human Resource Management
Week 9	Oct .26	♦ Lecture: System Requirements Analysis (Grady Parts 7 and 8) ♦ **Groups: Preliminary SRS due to professor (via BLS)** ♦ **Midterm Examination**
Week 10	Nov. 2	♦ Lecture: Cost Modeling ♦ Modern Topics ♦ Groups: Return preliminary SRS; SRS revision and cost models ♦ Lecture: Communications Management
Week 11	Nov. 9	♦ Lecture Cost Modeling ♦ Groups: SRS revision and cost models ♦ Lecture: Risk Management
Week 12	Nov. 16	♦ Lecture: Cost Modeling ♦ Modern Topics ♦ Lecture: Procurement Management
Week 13	Nov. 23	• Lecture: Cost Modeling • **Groups**: **Exchange SRS and cost models with Selected User Group;** ♦ Lecture: Professional Responsibility
Week 14	Nov. 30	♦ **ARG presentations of final SRS and cost model** ♦ **SUG submissions of evaluated SRS and cost model for their ARG**
Week 15	Dec. 7	♦ **ARG presentations of final SRS and cost model** ♦ **Group Deliverables Due:** to include SOW and valuation for each SRS from Users Group as well as SRS, Cost Model, and Final SRS for each project from Requirements Group
Week 16	Dec. 14 07:30PM -10:15PM	♦ **Final Examination**