George Mason University
Department of Systems Engineering and Operations Research
SYST 530 - Systems Engineering Management I
Fall 2017

30 Aug 2017

SYLLABUS

Course Summary

Professor: Dr. Philip Barry

Assignment Submission: Blackboard usage is required.

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Office Hours: By appointment

Course Description: Provides techniques for evaluating cost and operational effectiveness of system designs and systems management strategies. Discusses performance measurement, work breakdown structures, cost estimating, quality management, configuration management, standards, and case studies of systems from different application areas. *(from 2016-2017 catalog)*

Course Objectives: When students complete this course, they will understand and be able to discuss key aspects of:

- What enables systems engineers to be effective as an important consideration when managing projects
- What it means for a project to be successful
- How costs are associated with a project
- Scheduling a project and the risks associated with meeting it
- Earned Value Management for a project as a way of determining how well a project is keeping to its planned schedule and cost
- Articulating and managing risks associated with a project
- Selecting a sound organizational structure and staffing for a project

- Managing conflicts among project staff and project stakeholders to increase the likelihood of project success
- How projects are governed within a larger organizational structure

Course Hours: Wednesday 4:30 pm to 7:10 pm, Innovation Hall 333

Primary Text: Project Management: A Systems Approach to Planning, Scheduling and Controlling, 12th edition (2017); Harold Kerzner. John Wiley and Sons, ISBN: ISBN-13: 978-1119165354, ISBN-10: 1119165350

Readings: There will be a number of additional readings that will be posted on the class Blackboard site or will be available through the Mason Library or through the Internet. Additional readings will be free to students enrolled in the course.

Grades: 25% – Approximately 4 times in a 2-person group leading weekly paper discussions in class

10% - Participation as an individual in weekly paper discussions

15% - A 1-page to 2-page summary of each weekly paper

2% - A 1-page to 2-page proposal of Individual Term Research Paper

18% - Final Individual Term Research Paper

5% - Presentation of Term Research Paper to class

20% - Mini-Project

5% - Presentation of Mini Project to class

Grades will be assigned as follows: A= 94 – 100, A- = 90-93.9, B+ = 87-89.9, B = 84-86.9, B- = 80-83.9, C= 76 – 79.9 F= 0 – 75.9

Generally, late submissions of assignments will NOT be accepted. Extenuating circumstances will be considered by Dr. Barry *before* the assignment is due.

Note that because class participation is an important aspect of a student's grade, students are expected to attend every lecture.

Weekly Discussions on a Published Paper

During most weeks of the semester, part of the class will be devoted to discussing one or more assigned readings – a published paper on some aspect of systems engineering project management. These discussions are a critical part of the learning experience because project managers and systems engineers need to be skilled at giving presentations, leading discussions, analyzing and summarizing complex information, and critical thinking. Students will either lead the discussion or participate in the discussion. Discussions are expected to approximately 30 minutes depending on available time and the complexity and length of the paper Each student will have an opportunity about every three weeks to lead a class discussion either alone or as part of a pair, which will include

preparing PowerPoint slides to help guide the discussion. Everyone in the class is expected to fully participate in the discussion.

Each student who is not leading the discussion will submit via Blackboard a 1-page synopsis of the paper before the paper is presented in class.

Term Research Paper

Each student will individually write a paper on an area pertinent to this class; e.g., some aspect of leadership, planning, performance measurement, etc. There will be three deliverables for this paper. The first deliverable will be a short proposal for the paper. The second deliverable will be the paper itself, written using Microsoft Word. It must be at least 15 pages long, 1.15 spacing, with at least seven references. The title page, references, and any front matter will not count towards the 15 required pages. The paper will be graded based on the original contribution of the author. It will not be satisfactory to just document leadership styles, for example. The author would be expected to compare and contrast leadership styles and give an opinion on the subject. Stronger papers will involve collecting data to validate key points in the paper. The final deliverable will be a class presentation on the paper, complete with PowerPoint slides or other visual aids. *Students are encouraged to discuss drafts of their paper during office hours with Dr. Barry over the course of the semester.*

Mini Project

There will be five (5) working sessions to try out and learn various project management techniques. These working sessions will build upon material discussed in class will be hands on, focusing on applying the material discussed on a notional project. The work from each session will be integrated into a final package that will be presented at the end of the semester. Some out of class work to complete the assignments as well as to integrate them in to a coherent package may be required.

Additional Resources for The Research Paper

There is a wealth of literature available on the subject matter of this course. Theresa Calcagno, who works for the Mason Library, is available to help with references. Her email is : tcalcagn@gmu.edu.

Some potential references:

- INCOSE *Insight*
- INCOSE *Systems Engineering* Journal
- *Harvard Business Review*
- PMI *Project Management Journal*
- PMI *PM Network*

- IEEE *Transactions on Systems, Man and Cybernetics*
- IEEE *Transactions on Engineering Management*
- Systems Engineering Body of Knowledge (www.sebok.org)

Note that there are three main bodies of knowledge that intersect in this course: systems engineering (INCOSE, IEEE), leadership and management (Harvard Business Review), and project management (PMI).

Academic Integrity

The Honor Code will be read and signed by all students.

GMU is an Honor Code university; please see the University Catalog 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.

Disabilities Statement

If you are a student with a disability and you need academic accommodations, please see me and contact the Disability Resource Center (DRC) at 993-2474. All academic accommodations must be arranged through the DRC.

Other Useful Campus Resources:

WRITING CENTER: A114 Robinson Hall; (703) 993-1200; http://writingcenter.gmu.edu

UNIVERSITY LIBRARIES "Ask a Librarian"
http://library.gmu.edu/mudge/IM/IMRef.html

COUNSELING AND PSYCHOLOGICAL SERVICES (CAPS): (703) 993-2380;
http://caps.gmu.edu

UNIVERSITY POLICIES
The University Catalog, http://catalog.gmu.edu, is the central resource for university policies affecting student, faculty, and staff conduct in university affairs.

CLASS SCHEDULE

Week 1	30 August	⍰ **Introductions** ◆ **Course Overview – Syllabus** ◆ **Lecture: Kerzner Chapter 1 – Overview** ⍰ **Professor-Led Discussion of PAPER - *Atlas: Understanding What Makes Systems Engineers Effective in the US Defense Community*** ⍰ **Form 2 person groups**
Week 2	6 September	◆ **Lecture: Kerzner Chapter 2 – Project Management Growth: Concepts and Definitions** ◆ **Mini Project Selection** ◆ **Group A Student-Led Discussion of PAPER** • ***Why Software Projects Fail***
Week 3	13 September	◆ **Lecture: Kerzner Chapter 3 – Organizational Structures** ◆ **Group B Student -Led Discussion of PAPER** • ***Redesigning the Organizational Structure of a Project-Drive Company*** ◆ **Working Session: Designing the Organizational Structure**
Week 4	20 September	◆ **Lecture: Kerzner Chapter 4 – Organizing and Staffing the Project Office and Team** ◆ **Group C Student-Led Discussion of PAPERS –** • ***Collaboration Across Linked Disciplines*** • ***What Are the Characteristics that Software Development Project Team Members Associate with a Good Project Manager?***
Week 5	27 September	◆ **Lecture: Kerzner Chapter 5 – Management Functions** ◆ **Group A Student-Led Discussion of PAPERS** • ***Defense vs. Civilian – The Effect of Project Type on Performance*** • ***VW Emissions Scandal***
Week 6	4 October	◆ **Lecture: Kerzner Chapter 7 – Conflicts** ◆ **Group B Student-Led Discussion of PAPER** • ***FBI Virtual File Case Study*** ◆ **Exercise: Conflict Management**
Week 7	11 October	◆ **Lecture: Kerzner Chapter 11 – Planning** ◆ **Group C Student-Led Discussion of PAPER** • ***Can Agile PM Be Adopted in Industries Other Than SW Development*** ◆ **Working Class: Planning in Action**
Week 8	18 October	◆ **Lecture: Kerzner Chapter 9 – Network Scheduling Techniques** ◆ **Group A Student-Led Discussion of PAPERS** • ***Government Success Transforming Air Traffic*** • ***Evolution of Project Based Organization – A Case Study*** ◆ **Individual Homework: Myers-Briggs personality test at: http://www.humanmetrics.com/cgi-win/JTypes2.asp [Please submit 4 letter result in Blackboard by 25 Oct]**

Week 9	25 Oct	♦ Lecture: Kerzner Chapter 17 - Risk Management ♦ Group B Student-Led Discussion of Papers • *Denver Airport Baggage Handling* • *Customizable Framework for Project Risk Management* ♦ Working Class: Building a Risk Management Framework
Week 10	1 Nov	♦ Lecture: Myers-Briggs ♦ Lecture: Governing Project Development ♦ Instructor -Led Discussion of PAPER – *Enabling Systems Thinking to Accelerate the Development of Senior Systems Engineers* ♦ Instructor-Led Discussion of PAPER – *Relationships Between Leadership and Success in Different Types of Project Complexities*
Week 11	8 Nov	♦ Lecture: Kerzner Chapter 14 – Pricing and Estimating ♦ Lecture: Kerzner Chapter 15 – Cost Control ♦ Lecture: Earned Value Management ♦ Group C Student-Led Discussion of PAPER • *History, Practices and Future of EVM in Government*
Week 12	15 Nov	♦ Final term paper due ♦ Group A Student-Led Discussion of PAPER • *Managing ERP Implementation Failure* ♦ Working Session: Pricing and Cost Control
Week 13	22 Nov	♦ No Class Thanksgiving Break
Week 14	29 Nov	♦ Lecture: Chapter 20 – Quality Management ♦ Lecture: Chapter 24 – Managing Crisis Projects ♦ Group B Student-Led Discussion of PAPER • *STARS GAO Report* ♦ Group C Student-Led Discussion of PAPER • *Critical Success Factors for 6 Sigma Projects*
Week 15	6 Dec	♦ Individual presentations on term paper given in class ♦ Working Session: Quality Management
Week 16	13 Dec	♦ Team presentations on working sessions ♦ Class Review