

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

**SYLLABUS**

**Course Summary**

**Professor:** Dr. Art Pyster

**Assignment Submission:** Blackboard usage is required.

**Mobile Phone:** (703) 717-8110

**E-mail:** apyster@gmu.edu

**Office:** GMU: Engineering Building - Room 2212

**Office Hours:** Wednesdays 1 – 3 and 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, 11<sup>th</sup> edition (2013); Harold Kerzner. John Wiley and Sons ISBN: 978-1-118-02227-6

**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 3 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

25% - Final Exam

Grades will be assigned as follows: A= 92 – 100 B = 84 – 91.9 C= 76 – 83.9 D= 68 – 75.9 F= 0 – 67.9

Generally, late submissions of assignments will NOT be accepted. Extenuating circumstances will be considered by Dr. Pyster.

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. The current syllabus calls for 16 papers to be discussed, but this number may change as the course progresses. 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 last 30 minutes to one hour on each paper depending on available time and the complexity and length of the paper.

Students will form two-person groups. Each pair will have approximately 3 opportunities to lead a class discussion, 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 in a pair leading the discussion will submit via Blackboard a 1-page to 2-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. Pyster over the course of the semester.*

## **Final Exam**

There will be just one exam, which will be an open book and open notes take home exam. You may access the Internet, Mason Library, and other written sources for the exam, but you may not discuss it with anyone except Dr. Pyster.

## **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](mailto: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](http://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	25 January	<ul style="list-style-type: none"> <li>◆ Introductions</li> <li>◆ Course Overview – Syllabus</li> <li>◆ Lecture: Kerzner Chapter 1 – Overview</li> <li>◆ Professor-Led Discussion of PAPER - <i>Atlas: Understanding What Makes Systems Engineers Effective in the US Defense Community</i></li> <li>◆ <a href="#">Form 2 person groups</a></li> </ul>
Week 2	1 February	<ul style="list-style-type: none"> <li>◆ Lecture: Kerzner Chapter 2 – Project Management Growth: Concepts and Definitions</li> <li>◆ <a href="#">Group-Led Discussion of PAPER - <i>Why Software Projects Fail</i></a></li> <li>◆ <a href="#">Information Sheet and Honor Code due</a></li> </ul>
Week 3	8 February	<ul style="list-style-type: none"> <li>◆ Lecture: Kerzner Chapter 3 – Organizational Structures</li> <li>◆ <a href="#">Group-Led Discussion of PAPER - <i>Redesigning the Organizational Structure of a Project-Drive Company</i></a></li> <li>◆ <a href="#">Group-Led Discussion of PAPER – <i>SE Technical Authority</i></a></li> <li>◆ <a href="#">Individual term research paper 1-page to 2-page proposal due</a></li> </ul>
Week 4	15 February	<ul style="list-style-type: none"> <li>◆ Lecture: Kerzner Chapter 4 – Organizing and Staffing the Project Office and Team</li> <li>◆ <a href="#">Group-Led Discussion of PAPER - <i>Collaboration Across Linked Disciplines</i></a></li> <li>◆ <a href="#">Group-Led Discussion of PAPER - <i>What Are the Characteristics that Software Development Project Team Members Associate with a Good Project Manager?</i></a></li> </ul>
Week 5	22 February	<ul style="list-style-type: none"> <li>◆ Lecture: Kerzner Chapter 5 – Management Functions</li> <li>◆ <a href="#">Group-Led Discussion of PAPER – <i>Defense vs. Civilian – The Effect of Project Type on Performance</i></a></li> <li>◆ <a href="#">Group-Led Discussion of PAPER - <i>FBI Virtual File Case Study</i></a></li> </ul>
Week 6	1 March	<ul style="list-style-type: none"> <li>◆ Lecture: Kerzner Chapter 7 – Conflicts</li> <li>◆ <a href="#">Group-Led Discussion of PAPER - <i>Prior Ties and Trust Development in Project Teams</i></a></li> <li>◆ <a href="#">Group-Led Discussion of PAPER – <i>VW Emissions Scandal</i></a></li> </ul>
Week 7	8 March	<ul style="list-style-type: none"> <li>◆ Lecture: Kerzner Chapter 11 – Planning</li> <li>◆ <a href="#">Group-Led Discussion of PAPER – <i>Can Agile PM Be Adopted in Industries Other Than SW Development</i></a></li> <li>◆ <a href="#">Group-Led Discussion of PAPER – <i>Innovation in Megaprojects</i></a></li> </ul>
Week 8	15 March	◆ <b>SPRING BREAK – no class</b>
Week 9	22 March	<ul style="list-style-type: none"> <li>◆ Lecture: Kerzner Chapter 9 – Network Scheduling Techniques</li> <li>◆ <a href="#">Group-Led Discussion of PAPER – <i>Government Success Transforming Air Traffic</i></a></li> <li>◆ <a href="#">Individual Homework: Myers-Briggs personality test at:  <a href="http://www.humanmetrics.com/cgi-win/JTypes2.asp">http://www.humanmetrics.com/cgi-win/JTypes2.asp</a>  [Please submit 4 letter result in Blackboard by 29 March]</a></li> </ul>
Week 10	29 March	<ul style="list-style-type: none"> <li>◆ Lecture: Kerzner Chapter 17 - Risk Management</li> <li>◆ <a href="#">Group-Led Discussion of PAPER – <i>Denver Airport Baggage Handling</i></a></li> </ul>

Week 11	5 April	<ul style="list-style-type: none"> <li>◆ Lecture: Myers-Briggs</li> <li>◆ Lecture: Governing Project Development</li> <li>◆ Group-Led Discussion of PAPER – <i>Enabling Systems Thinking to Accelerate the Development of Senior Systems Engineers</i></li> </ul>
Week 12	12 April	<ul style="list-style-type: none"> <li>◆ Lecture: Kerzner Chapter 14 – Pricing and Estimating</li> <li>◆ Lecture: Kerzner Chapter 15 – Cost Control</li> <li>◆ Lecture: Earned Value Management</li> <li>◆ Group-Led Discussion of PAPER – History, Practices and Future of EVM in Government</li> </ul>
Week 13	19 April	<ul style="list-style-type: none"> <li>◆ Lecture: Chapter 20 – Quality Management</li> <li>◆ Lecture: Chapter 24 – Managing Crisis Projects</li> <li>◆ Group-Led Discussion of PAPER – <i>STARS GAO Report</i></li> <li>◆ Final term paper due</li> </ul>
Week 14	26 April	<ul style="list-style-type: none"> <li>◆ Individual presentations on term paper given in class</li> </ul>
Week 15	3 May	<ul style="list-style-type: none"> <li>◆ Individual presentations on term paper given in class</li> <li>◆ Discussion: Course Review</li> </ul>
Week 16	10 May	<ul style="list-style-type: none"> <li>◆ Final Exam distributed on May 10 and due on 15 May</li> </ul>