

## Syllabus: IENG 305 Introduction to Systems Engineering - Fall 2018

**Catalog Description:** IENG 305. 2 Hr. This course focuses on systems engineering and analysis. It covers the development and implementation of systems, and their continuous improvement.

**Prerequisites:** IENG 213, IENG 377

**Instructor:** Randy Quinn  
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Cell: (412) 398-1784

**Office hours are immediately before and after class by appointment.**

Evansdale Innovation Center, NRCCE Building, Office# TBD

**Free Textbooks:** NASA Systems Engineering Handbook  
Systems Engineering Fundamentals, Defense Acquisition University Press  
System Engineering “Toolbox” for Design-Oriented Engineers, B.E. Goldberg

**Course Objective:** The main objective of this course is to introduce systems engineering methods, tools, and management techniques to undergraduate Industrial Engineering students.

**Course Outcomes:** By the end of this course, students will be able to:

1. Design and develop systems, and bring them into being
2. Control the operations and/or details of systems that are already in existence
3. Analyze existing systems in order to improve them

**Contribution of course to meeting the professional component:** Engineering topics 100%, significant design content.

### [Links to University Policies](#)

1. [Academic Integrity Statement](#)
2. [Academic Standards Policy, including Academic Dishonesty](#)
3. [Accessibility Statement \(see Inclusivity Statement\)](#)
4. [Adverse Weather Statement](#)
5. [Attendance Policy](#)
6. [Campus Safety Statement](#)
7. [Inclusivity Statement](#)
8. [Incomplete Policy](#)
9. [Sale of Course Material Statement](#)
10. [Sexual Misconduct Statement](#)
11. [Student Evaluation of Instruction Statement](#)

**Schedule:**

<u>Week</u>	<u>Date</u>	<u>Topic</u>	<u>Activity</u>
1	8/21	Systems Definitions and Concepts	Syllabus, grading, project, concepts
2	8/28	Project life cycle, scope and con-ops	Project introduction and <b>team creation</b> . <b>Deliverables:</b> Each Team with its own workbook tab: Team Contact list, Scope, Con Ops, FAA Regulations summarized
3	9/4	Teams are tough and what to do about it	Team agreement. Team Creation.
4	9/11	Project management and project rescue/Project Schedule	Create project task list with critical path indicated. Project Gantt chart.
5	9/18	Requirements creation, configuration and management/ Design/ System architecture and system hierarchy	Project Requirements, Morphological Matrix, Architecture,
6	9/25	Analytic Hierarchy Process	AHP
7	10/2	Exam 1	
8	10/9	Risk	Fault Tolerance
9	10/16	Reliability	FMEA
10	10/23	Interfaces/Verification	N <sup>2</sup> Diagram (update requirements), Verification Matrix
11	10/30	Margins	
No Class	11/6	<b>Election Day Holiday</b>	No Class
12	11/13	Special Topics/ Software Systems Engineering	
13	11/20	Thanksgiving Week	Likely timeframe for balloon attempts
14	11/27	Exam 2	
15	12/4	Project Presentations	Project Quiz, Project Reports Due

**Grading:**

<u>Weight</u>	<u>Type</u>	<u>Specifics</u>
0%	Homework and assignments	Completing 100% of the homework and assignments on time will earn a 2% bonus. Most homework will be spent on the class project.
35%	Exam 1	
35%	Exam 2	
20%	Project	The project will be team based and graded on project outcome.
10%	Project Quiz	The quiz will be about your project.