

SE510 Systems Engineering

Credits: 3

Systems Engineering (SE) is a structured approach to developing interdisciplinary and complex products. This course will introduce SE methodologies spanning the product development lifecycle from initial scope definition through delivery of the prototype or first production article. SE techniques are used to define and manage requirements, analyze and optimize product architectures, develop comprehensive designs, plan and supervise manufacturing, test and evaluation, and implement the production line. SE also provides techniques for ensuring that system-level requirements (*i.e.*, reliability, maintainability, safety, etc.) are incorporated into the final product. Spanning all these activities are a set of SE analysis and control functions that continuously assess and manage the product scope, quality, configuration, interfaces and performance.

Level of the Course:

Anticipated Percentage of Undergraduate Student Enrollment: 10%

Anticipated Percentage of Graduate Student Enrollment: 90%

Prerequisites: (If none, please explain reasons for absence)

Senior or Graduate standing

Course Outline:

Classes are 2.5 hours long and will be held once a week

Day	Topic
1	Systems Engineering Overview
2	System Engineering Processes and Standards
3	Concept Development and System Scope
4	Requirements and Specifications
5	Functional Analysis and Allocation
6	System Trades / Exam 1
8	System Trades
9	Design Synthesis and System Architecture
10	System Analysis and Control
11	Configuration Management
12	Specialty Engineering 1
13	Verification and Validation 1/ Exam 2
14	Verification and Validation 2 and Planning
15	Putting it together: the B-2 Case Study
16	Final Exam

Method of Evaluation or Assessment:

30% Homework

20% First Exam

20% Second Exam

30 % Final Exam

Architecture Framework Working Group 9, February 2004

8. B-2 Systems Engineering Case Study, John M. Griffin, James Kinnu and John, M. Colombi, Center for Systems Engineering, AFIT, Wright Patterson AFB, OG