

Introduction to Systems & Industrial Engineering

Catalog Description: SIE 250 -- System modeling; the elementary constructs and principles of system models including discrete time, discrete-state system theory; finite state machines; modeling components, system coupling, modes, homomorphisms and system experiments (simulation). System design including: requirements, life-cycle, performance measures and cost measures, tradeoffs, alternative design concepts, testing plan, and documentation. Applications and case studies from engineering.

Prerequisite(s): ENGR 102, MATH 129

Instructor: Mike O'Brien, mikeazobrien@email.arizona.edu

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Office Hours: M/W/F 12:30 AM-2:00 PM, or by appointment (email an appointment request)

Website: Desire2Learn will be used for the class website (<http://d2l.arizona.edu>)

Class: MWF 11:00-11:50 AM, AME 212S

Textbook: There is no specified textbook for this class. Material will be made available on the course website to support class lectures.

Software: A variety of software will be used: MATLAB and SIMULINK, Excel, and other packages as needed.

Grading: [Regular grades](#) are awarded for this course: A B C D E.

- 40% Two (2) Exams
- 25% Final Exam
- 15% Homework and Class Participation
- 20% Design Project

Reference:

- www.incose.org (website of the International Council on Systems Engineering)
- www.mathworks.com (MATLAB and SIMULINK website)
- en.wikipedia.org/wiki/Project_management (Project Management wikipedia)

Course Objectives:

This course is intended to give students background and a foundation in the design and operation of systems. We will discuss the systems design process including: Requirements Development, Concept Development, System Architecture Definition, Trade-off Analysis, System Development, Testing, Deployment, and Project Management. We will concentrate on System Modeling, Analysis and Simulation, Performance Measures, Trade-off Studies, Design Optimization, and Project Management.

The class has the following specific educational goals for students. By the end of the course, the students should:

- Understand the system design process including requirements development and system specifications.
- Understand the role of models in the system design process
- Understand and use standard tools and vocabulary.
- To gain experience working in teams to develop solutions to complex engineering design problems.
- To gain experience writing professional quality reports.
- Understand basic project management techniques and software