

# 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:** [Larry Head](mailto:klhead@email.arizona.edu), klhead@email.arizona.edu

ENGR 251, +1 520 621-2264

Office Hours: By appointment (please send me an email asking for a meeting). I will plan to be available Monday and Friday 3-5 PM, but I have travel and meeting requests frequently during the semester, so please ask for a time. You can see my availability at:

[http://bit.ly/calendar\\_klhead](http://bit.ly/calendar_klhead)

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

**Class:** MWF 11:00-11:50 AM, AME 212S (The classroom may change)

**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
- 20% Design Project

**Reference:**

- [www.incose.org](http://www.incose.org) (website of the International Council on Systems Engineering)
- [www.mathworks.com](http://www.mathworks.com) (MATLAB and SIMULINK website)
- [en.wikipedia.org/wiki/Project\\_management](http://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.
- 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 design problems.
- To gain experience writing professional quality reports.
- Understand basic project management techniques and software