# SIE 250 - Introduction to Systems & Industrial Engineering

**Credits and Contact Hours:**

- 3 Credits – Three 50-minute lectures per week.

**Instructor’s or course coordinator’s name:**

- John Ullrich

**Textbook, title, author and year:**


- A variety of software will be used: MATLAB, SIMULINK, and Excel.

**2021-2022 Catalog Description:**

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

**Prerequisites:**

- ENGR 102, MATH 129

**Required, Elective, or Selected Elective:**

- Required

**Course Objectives:**

- Define key elements of a systems engineering lifecycle
- Apply principles and practices of requirements derivation into the functional and physical architecture
- Apply a working knowledge of interface design
- Define critical interfaces
- Define key elements of Six Sigma and Lean and their application
- Describe and apply the DMAIC phases
- Apply MATLAB/Simulink tools, such as basic mathematical modeling, and optimization
- List and apply key Lean concepts, such as Muda (waste reduction), VSM, value analysis, and other Lean fundamental concepts
Student Outcomes –
Listed in Criterion 3 or any other outcomes are addressed by the course:

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<thead>
<tr>
<th>Learning Outcome</th>
<th>Measure</th>
<th>Standard/Threshold</th>
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<tr>
<td>(2) an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors</td>
<td>Semester Design project</td>
<td>75% of the students must score 70% or higher</td>
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<td>(5) an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives</td>
<td>Peer evaluated average participation on semester design project</td>
<td>75% of the student will achieve 80% or higher participation</td>
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<td>(6) an ability to develop and conduct appropriate experimentation, analyze and interpret data and use engineering judgment to draw conclusions</td>
<td>Homework Assignment #3 – System Modeling</td>
<td>75% of the students must score 75% or higher</td>
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Topics covered: This course is intended to give students background and a foundation in the design of systems. We will discuss the systems design process including:

- Requirements Development
- Concept Development
- System Architecture Definition
- Trade-off Analysis
- System Testing
- System Modeling
- Analysis and Simulation
- Performance Measures
- Design Optimization
- Project Management