*1. Course number and name*
**ENGR 446: Control Systems Laboratory**

*2. Credits and contact hours*
1 credit hour; one three-hour session/week

*3. Instructor's or course coordinator's name*
Instructor:  M. Azadi, Assistant Professor of Mechanical Engineering
Course coordinator: M. Azadi, Assistant Professor of Mechanical Engineering

*4.* Text book, title, author, and year
None required

  *a.  other supplemental materials*
Dabney and Harman, *"Mastering Simulink"* Prentice Hall, 2004.
Mathworks.com resources for students.

*5. Specific course information*
  a. *brief description of the content of the course (catalog description)*
Simulation and modeling of control systems using Matlab and Simulink.

  b. *prerequisites or co-requisites*
ENGR 447: Control Systems (may be taken concurrently)  .

  c. *indicate whether a required, elective, or selected elective course in the program*
Required / Elective for Mechanical Engineering; required for Electrical Engineering.

*6. Specific goals for the course*

  *a.  specific outcomes of* instruction

- Students will be familiar with the basic concepts of system simulation
- Students will be reasonably well versed in the use of Simulink
- Students will be able to simulate systems from verbal system descriptions

- Students will be introduced to simulation techniques for hybrid systems

- Students will be familiar with basic procedures associated with interfacing real-life systems with computer-based controllers.

- Students will be able to write short technical memos to report the results of their simulations

- Students will use the Mathworks Control Systems Toolbox for implementing the various controller design techniques.

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b.  *explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.*
    Course addresses ABET Student Outcome(s): a, b, e, g, i, k.

7. *Brief list of topics to be covered*

- Review of basic systems concepts

- Effect of system parameters on system response

- Use of Simulink in simulation of  continuous systems

- Simulink tools

- Using of simulation in evaluating controller design

- Basic introduction to the use of microcontrollers in control systems