1. ES200 Introduction to Systems Engineering

2. 4 credit hours, 3 recitation hours, 2 laboratory hours

3. Course Coordinator: Jenelle Piepmeier

   Additional Instructors: John Donnal, Dennis Evangelista, Paul Frontera

4. Textbook: C: How to Program (8th Edition), Dietel, 2015
   Getting Started with MATLAB (7th Edition), Pratap, 2017

5. Specific course information

   a. This course acts as an introduction to the discipline of systems engineering, focusing on programming, hardware interfacing, and the development and integration of hardware and software solutions to engineering problems. Using a systems-level, project-based approach, the course also ties together the mathematics, science and technological courses from the core, and introduces the student to the basics of technical communication.

   b. Prerequisites or co-requisites: N/A

   c. Required course

6. Specific goals for the course

   a. At the conclusion of the course, students will be able to:

      - Foster an understanding of the tools and techniques of systems engineering
      - Build confidence in designing algorithms to solve a variety of problems by developing experience and proficiency with:
        - C programming for microcontrollers
        - MATLAB programming and capabilities
        - Basic actuation (DC motors and servomotors)
        - Serial interfacing
      - Gain insight into the engineering process
      - Build community in the systems engineering major

   b. This course introduces the following Student Outcomes

      - (c) an ability to design a system
      - (d) an ability to function on multidisciplinary teams

- (g) an ability to communicate effectively
- (k) an ability to use techniques, skills, and modern engineering tools

Outcome (d) is assessed in this course

7. Topics covered:

    - Algorithms
    - Programming constructs in C and MATLAB: sequential, conditional, and repetitive
    - Digital inputs, Digital outputs, PWM outputs on a microprocessor
    - DC motors, hobby servo motors
    - Serial port communications