

1. ES201 Introduction to Systems Engineering
2. Credit Hours: 2 hours of lecture, 2 hours of lab/recitation, 3 hours credit
3. Instructors: Prof Brad Bishop
Assoc Prof Randy Broussard
Prof Robert DeMoyer
Assoc Prof Jenelle Piepmeier
4. Text book:
C: How to Program (6th Edition) ISBN-13: 978-0136123569
MATLAB Programming for Engineers (4th Edition) by Chapman ISBN-13: 978-0495244493
5. Specific course information
 - a. Focuses on the development of fundamental programming and basic hardware interfacing through the use of project-based learning. Includes Dynamic C and MATLAB.
 - b. Prerequisites: None
 - c. Required course, the first in the Systems Engineering major
6. Specific goals for the course
 - a. Upon completion of the course, students will be able to:
 - Understand and appreciate the tools and techniques of systems engineering
 - Design algorithms to solve a variety of problems
 - Be able to implement algorithms in:
 - Dynamic C
 - MATLAB
 - Program for numerical computations and bit manipulation
 - Identify and interface DC motors and R/C servomotors
 - Program and connect serial communications and devices
 - Use the 2D graphics capability of MATLAB to produce data plots and graphical interfaces
 - Follow the basic engineering process to solve a problem
 - b. Student outcomes listed addressed by the course.
 - Outcome 1 (Identifying, formulating, and solving engineering problems): pseudocode and algorithm design, open-ended projects with self-defined objectives
 - Outcome 2 (Apply modern engineering tools): programming in C and MATLAB
 - Outcome 3 (Design system, component, or process): Open-ended projects with specific performance metrics
 - Outcome 4 (function and communicate effectively in multi-disciplinary teams): final project involved two sub-teams that had to design separate components to be used together
 - Outcome 5 (have knowledge of contemporary issues, an understanding of professional and ethical responsibilities, and understand the impact of engineering solutions in a global and societal context): students were required to complete a Systems News assignment, one of which was discussed each class day.
7. Brief list of topics to be covered

Lecture Topics	Lecture sessions
1. Basic pseudocode and algorithm development	4
2. C syntax and programming	5
3. Microprocessors and I/O	1
4. Actuators	1
5. Technical communication	1
6. MATLAB coding	3
7. MATLAB graphics	2
8. Serial communications	2
9. Review and practice	2

Lab Topics	Laboratory sessions
1. The design process	2
2. Basic C programming	1
3. C-based hardware project	4
4. Basic MATLAB	1
5. MATLAB hardware and graphics project	4
6. C and MATLAB interfacing project	4