

## EEL 2161 C for Engineers

**Credits:** 3

**Text book, title, author, and year:**

1. Engineering Problem Solving with C by D. M. Etter, Pearson, 4<sup>th</sup> Edition, 2013.
2. Introduction to MATLAB by D. M. Etter, Pearson, 2<sup>nd</sup> Edition, 2011.

**Supplemental materials:** none

**Specific course information**

**Catalog description:** This course introduces the fundamental capabilities of C programming and MATLAB. It illustrates the numerical problem-solving process, testing and interpretation of results through a variety of engineering examples and applications.

- **Prerequisites or Co-requisites:** No prerequisites are listed in the catalog. The course is targeted for students majoring in engineering and the sciences. Familiarity with computers is helpful however, extra help will be provided for those who have never used a computer before.
- **Required, elective, or selected elective:** required

**Specific goals for the course**

**Specific outcomes of instruction:** By the end of the course students will be able to: (i) develop engineering problem solving skills (ii) know how to develop an algorithm and convert the algorithm to a C program (iii) learn to test the solution with simple and data sets (iv) learn the standard input and output formats in C (v) learn the numerical technique of linear interpolation (vi) know how to use control structures (vii) use input and output data files (viii) learn modular programming and engineering problem solving skills in Matlab (ix) learn various Matlab functions including random number generation (x) know how to generate 2-D and 3-D plot in Matlab (xi) know how to perform matrix operations and solve systems of linear equations (xii) be familiar with symbolic mathematics and be exposed to a variety of numerical techniques using Matlab.

**Brief list of topics to be covered:**

- Simple C Programs
  - Control structures and data files
  - Modular Programming, **function** prototypes
  - Arrays of one and many dimensions
- MATLAB
  - The MATLAB environment, functions and matrices
  - Solutions to systems of linear equations and circuit analysis
  - Interpolation and curve fitting, signal sampling and reconstruction

- Numerical integration, differentiation, velocity, distance, power and energy computations