

EE 224 Electrical Engineering Programming Laboratory. This course provides advanced programming concepts for electrical engineering majors. The course is specifically aimed at programming microcontrollers and the use of programming tools in electrical engineering. Topics covered include bit manipulation, memory allocation concepts, architectural considerations, real time events, specialized microcontroller I/O, and programming with MATLAB[®] and other simulation tools.

MATLAB Tutorials:

1. UTube tutorial from Mathworks
<https://www.youtube.com/watch?v=Ta1uhGEJFBE>
2. Mathworks tutorials on various topics
<https://www.mathworks.com/support/learn-with-matlab-tutorials.html>

C References:

1. Hanly, Jeri, R. and Koffman, Elliot B., Problem Solving and Program Design in C, 8th edition, Pearson, 2016. Rent for \$40 from Amazon or buy used for \$85.

Software:

1. CA ARM C Compiler for the ARM Cortex M4 microcontroller from Keil Software. You may download the most recent student version from <http://www.keil.com/> choose *Evaluation Software* under downloads and click on *ARM Tools*. Fill out the registration form. The demo version includes manuals.
2. MatLab (Student edition version R2017A (or later) or Professional edition available on CECS network).

Hardware:

1. Each student will need a 3-wide solderless breadboard for project construction. These are available through the stockroom or you can use the one that was required for EE 210/215.
2. ARM Cortex M4 Nucleo Board will be used for projects. This board is available for about \$15 dollars or you can purchase one from the EE office.

There will be no hour exams, 14 short quizzes, homework assignment projects, and a two hour comprehensive final exam. All quizzes are open book and open notes. The quizzes will count 50% of the grade, the homework will count 25%, and the final will count 25%.

All students must receive a grade of at least 50% on the programming assignments to pass the course regardless of exam scores.

Contact Information:

Dr. Blandford
KC 266A
(812)-488-2291
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KC 247
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Help sheets, assignments, and other information will be posted on the web site at
<http://csserver.evansville.edu/~blandfor>

Final Exam is Tuesday, May 7 at 11:00am

Engr 123 Syllabus Supplement

Catalog Description Introduction to structured programming of computers in a modern high level language. Students complete programming projects that include loop and branch constructs, the use of subprograms, algorithm design, arrays, debugging software and techniques, file I/O, and class constructs. Spring.

Credit Hour Policy This course meets the federal requirements of 15 in-class hours plus an expected 30 hours of out-of-class work per credit hour over a semester. (At least 135 hours total; 9 per week)

Time & Place EE 224 meets Tuesday and Thursday from 11:00AM to 12:15PM in Koch Center 136

Course Objectives Statement

The objective of this course is to teach students to solve computational problems using structured top-down design, functional decomposition, and abstraction techniques. Each student will complete weekly programming assignments in an appropriate high-level language and several larger programming projects

Course outcomes by program outcome

1a. Students will use math and science to solve problems in their major field of study.

Students will have a basic understanding of C# (1a ABET a)

1b. Students will be able to apply the concepts of their field of study to formulate problems and identify creative solutions.

Students will be able to solve basic problems using knowledge gained in the C# language. (1b ABET e)

1c. Students will have mastered the skills and tools of their profession.

All students will demonstrate a working familiarity with the Microsoft Visual Studio programming and debugging environment. (1c ABET k)

2c. *Students will be able to communicate effectively both orally and in writing.*

- Students will write complete explanations of computer architecture concepts in a clear and effective manner.
- Students will complete a formal term paper on a computer architecture topic.
- All students will demonstrate an ability to orally explain topics in computer architecture in a clear and effective manner.

3b. *Graduates will be cognizant of contemporary issues.*

- Students will be introduced to contemporary professional issues.
- Students will complete a term paper on a contemporary professional issue related to computer architecture.

Homework Problems will be assigned daily. Assignments are posted on the website.

Attendance Policy You are expected to attend all class sessions. Absences may adversely affect your grade.

Office Hours Dr. Blandford's office is Koch Center 266, Campus phone is 2201. He will usually be in his office from 7:00 to 8:00 AM and 2:00-3:00 PM on MWF and from 7:00 to 10:00AM on TT.

Disability Policy It is the policy and practice of the University of Evansville to make reasonable accommodations for students with properly documented disabilities. Students should contact the Office of Counseling and Health Education at 488-2663 to seek services or accommodations for disabilities. Written notification to faculty from the Office of Counseling and Health Education is required for academic accommodations.

Honor code This course will be governed by the University of Evansville Honor Code, which is

I will neither give nor receive unauthorized aid, nor will I tolerate an environment that condones the use of unauthorized aid

This code has two fundamental expectations:

- Students will submit as their own work only those items that are indeed their own work
- Students will hold each other responsible for adhering to the Code