

**Engr 101
Syllabus**

**Fall 2019/20
Blandford/Randall**

Web site: <http://csserver.evansville.edu/~blandfor>

Text: These two books are available as a free download in pdf format.

1. Bailey, Tim, [An Introduction to the C Programming Language and Software Design](http://www-personal.acfr.usyd.edu.au/tbailey/ctext/ctext.pdf),
<http://www-personal.acfr.usyd.edu.au/tbailey/ctext/ctext.pdf>

2. Horton, Ivor, [Beginning C](http://www.mosaic-industries.com/embedded-systems/_media/c-ide-software-development/learning-c-programming-language/beginning-c-5th-edition-ivor-horton.pdf),
http://www.mosaic-industries.com/embedded-systems/_media/c-ide-software-development/learning-c-programming-language/beginning-c-5th-edition-ivor-horton.pdf

Reference:

1. Brian W. Kernighan and Dennis M. Ritchie, [The C Programming Language](https://www.dipmat.univpm.it/~demeio/public/the_c_programming_language_2.pdf),
https://www.dipmat.univpm.it/~demeio/public/the_c_programming_language_2.pdf
or this is available from Amazon at
<https://www.amazon.com/Programming-Language-2nd-Brian-Kernighan/dp/0131103628>
for about \$20 used.

Software:

1. Microsoft Visual Studio 2019 is available on the campus network. For your personal computer you can use Visual Studio Community for Windows Desktop which can be downloaded from <https://visualstudio.microsoft.com/vs/express/>
Download Community 2019 for Windows Desktop.
2. CA ARM C Compiler for the ARM Cortex microcontrollers 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.

Hardware:

1. Printed circuit boards for the ARM Cortex M0+ Nucleo Board. This board will be available from the EECS office (paid for by lab fees).

There will be 3 hour exams, graded homework projects, and a 2 hour comprehensive final exam. The homework will count 18%, the final will count 22%, and the 3 hour exams will count 20% each. All exams are open book and open notes.

Final Exam is Wednesday, December 11, 2019 at 8:00am

Engr 101**Fall 2019/20**

Monday	Wednesday	Friday
	Aug. 21 Intro and overview	Aug. 23 Notes Visual Studio – creating a project.
Aug. 26 H27-34, B8-13 Variables types, operators, expressions, simple I/O	Aug. 28 H35-75, B13-16 Arithmetic, math functions, relational operators	Aug. 30 H85-128, B17-20 Branching, if-else
Sept. 2 Labor Day	Sept. 4 H135-182, B20-23 Loops	Sept. 6 H135-182, B20-23 Loops
Sept. 9 Review	Sept. 11 Hour Exam 1	Sept. 13 B105-114 Review exam. Formatted IO
Sept. 16 H321-342 B25-32 Functions	Sept. 18 H349-373, B25-32 Parameter passage	Sept. 20 H349-373, B49-57 Parameter passage - pointers
Sept. 23 Intro to functions	Sept. 25 H185-247 B59-65 Arrays and strings	Sept. 27 H185-247 B59-65 Arrays and strings
Nov. 30 Examples	Oct. 2 Review	Oct. 4 Hour Exam 2
Oct. 7 Fall Break	Oct. 9 Notes Review exam Intro to Inventor	Oct. 11 Notes Intro to Inventor
Oct. 14 Notes The Keil IDE	Oct. 16 Harlaxton	Oct. 18 Notes STM32L0K6 Proccessor
Oct. 21 Notes First Keil Project - MBed	Oct. 23 MBed classes, Serial I/O	Oct. 25 Serial I/O Formatting
Oct. 28 Memory FFs, registes LEDs	Oct. 30 Bit operations, LEDs and Switches	Nov. 1 Advising Session
Nov. 4 Bit operations, time delays	Nov. 6 A/D Conversion	Nov. 8 A/D Converstion (Last day to withdraw with W)
Nov. 11 PWM	Nov. 13 PWM	Nov. 15 Review
Nov. 18 Hour Exam 3	Nov. 20 Thanksgiving Break	Nov. 22 Thanksgiving Break
Nov. 25 Review Exam Holiday Decoration	Nov. 27 Holiday Decoration	Nov. 29 Holiday Decoration
Dec. 2 Holiday Decoartion	Dec. 4 Final exam review	

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Engr 101 Syllabus Supplement

Catalog Description ENGR 101 Introduction to Engineering (3) A hands-on introduction to civil, computer, electrical, and/or mechanical engineering. Topics include the use of the computer in engineering and an introduction to the design process. Student teams led by faculty (typically the students' academic advisor) complete design projects in a particular discipline. Prerequisite: Completion of all required English language courses or permission of instructor. Fall.

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 Engr 101 meets Monday, Wednesday, and Friday at 9:00 AM in Koch Center 137

Learning Objectives After completing this course, successful students will be able to:

Course Objectives Statement

The objectives of this course are to teach students the design process for the implementation of a complete project which uses one or more microcontrollers.

Objectives by outcome

- 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 write programs using selection, repetition, and functions in one or more assembly languages. (ABET 1)
Students will be able to write programs using selection, repetition, and functions in at least one major high level language. (ABET 1)
Students will understand the hardware/software interface for basic I/O devices such as A/D and D/A converters and parallel and serial ports. (ABET 1)
Students will understand how to use a micro controller for fundamental I/O and control purposes. (1b ABET 1)
All students will have experience in a high level language on at least two different microcontrollers. (ABET 1)
- 2b. Students will be able to determine the requirements of an "open-ended" problem statement, complete a design and implementation to fulfill those requirements, and evaluate the effectiveness of the design.
Students will complete at least two open ended design problems requiring an understanding of hardware and software. (ABET 2)

Homework Problems will be assigned weekly. Most will require a program in either assembly language or C to be executed on a microcontroller. Assignments will differ as to what is to be turned in and what is the due date. This information will be placed on the assignment sheet.

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 2291. He will usually be in his office from 7:00 to 10:00AM.

Revised: August 13, 2019

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