

ECE251 Course Syllabus: Fall 2020
Introduction to Microprocessors
TR 8:00 – 9:15 Stadium 1204

Instructor: Dr. Bill Eads, Engr C103E
Office phone: (970) 491-0717 (during office hours only)
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Office hours: Tues, Thurs 9:30–10:30 ([ZOOM](#)) or by appointment

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Texts: Embedded Systems with ARM Cortex-M Microcontrollers in Assembly Language and C (Third Edition), Dr. Yifeng Zhu, ISBN: 978-0-9826926-6-0 First or second edition acceptable.

The C Programming Language, Kernighan and Ritchie. Available online

Course Description: **Microprocessor organization, The C Programming Language, Assembly Language, I/O techniques, device interfaces, applications, hardware and software.**

Prerequisite: **ECE102 (Digital Circuit Logic)**

Grading and Exams (tentative): **(+/- and upward curve grading is used)**

Midterm Exams	36%
Final Exam	9%
Labs & Practicals	30%
Homework Assignments	10%
Quizzes & Participation	15%

Homework: **Homework problems will usually be assigned every other week due two weeks later. Late homework will not be accepted without prior instructor approval.**

Labs: **There will be a series of 10 labs using the TM4C123G processor board; they are one and two week labs. There will be 1-2 lab practical exams in lab during the course, focused on programming this processor. Successful completion of all labs is required for a passing course grade.**

Collaboration: **You are expected to work on all homework problems and labs yourself (or within your team), but reasonable collaboration is allowed and encouraged. Copying homework or software from another student is not allowed. No collaboration will be allowed on any quiz, exam or practical.**

Attendance in class or online is expected. **If you are unable to attend class, it is your responsibility to obtain class notes or other information. Make-up quizzes will not be allowed; however, your lowest quiz score will be dropped from your quiz average.**

ECE 251 Course Outline

Digital Logic Fundamentals

Microprocessors: Major Components

C Programming Language

ARM Cortex Microcontroller: Register Model & Addressing Modes

ARM Cortex Assembly Language Programming

ARM Cortex Instruction Set:

Data transfer and manipulation instructions

Arithmetic Instructions

Logical and Bit Operations

Branch Instructions

Advanced Assembly Programming

Software Delay

Programming Techniques

Assembly Process

Loops

Stack and Stack Pointer

Subroutines and Parameter Passing

MID-TERM Exam 1 in class/online

Parallel I/O

Exceptions: Resets and Interrupts

ARM Cortex Communication Systems—Serial vs. Parallel

Analog-to-Digital Conversion

SysTick Real Time Clock

Timer Module

Fixed-Point and Floating-Point Numbers

MID-TERM Exam 2 in class/online

Adding Memory to Processor

Guest Lecture: Future of Computing

Course Review

FINAL EXAM (online)