

ECE251 Course Syllabus: Fall 2021
Introduction to Microprocessors
TR 8:00 – 9:15 Clark A207

Instructor: Dr. Bill Eads, ENGR C103E
Office phone: (970) 491-0717 (during office hours only)
Home phone: (970) 667-6914 (until 10 p.m.)
Email: BEadsinCO@gmail.com
Office hours: Tue., Thur. 9:30–10:30

Office Hours

Lab TA Thom Wilkinson tgwilk24@rams.colostate.edu
Grader Jose Alamos Jose.Alamos@colostate.edu

Monday 12-1 pm
Thursday 2-3 pm

Texts: Embedded Systems with ARM Cortex-M Microcontrollers in Assembly Language and C
Dr. Yifeng Zhu, ISBN: 978-0-9826926-6-0, all editions 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 Exam	18%
Final Exam	27%
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 a lab practical exam 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

MID-TERM Exam #1 in class ~Oct. 7

Advanced Assembly Programming

Software Delay

Programming Techniques

Assembly Process

Loops

Stack and Stack Pointer

Subroutines and Parameter Passing

Mixing C and Assembly

Parallel I/O

Exceptions: Resets and Interrupts

SysTick Real Time Clock

ARM Cortex Serial I/O

Fixed-Point and Floating-Point Numbers

Analog to Digital Converter

Adding Memory to Processor

FINAL EXAM Monday, Dec. 13, 2:00 p.m.