

1. Course Number and Name:

EET 3350 Embedded Systems
Design

2. Credits and Contact hours:

Credits: 4 hour, Contact: 3 lecture hour; 2 Lab Hours

3. Instructor's or course coordinator's

name: Ted Evans

4. Text book, title, author, and

year: Embedded Systems:

Introduction to the Arm®

Cortex™-M3, Second Edition

**a. Other supplemental
materials:** None

5. Specific Course Information:

a. Brief description of the content of the course (catalog description):

This course covers different aspects of real-time embedded systems implementation with low-level access to hardware resources of microcontrollers. Topics include but not limited to low-level and high-level microcontroller programming covering assembly and C, I/O access, interrupt-driven programming, timers, serial interfacing, analog-to-digital (ADC), and digital-to-analog (DAC). Uses system design approach, such as flow charts, finite state machines (FSM) while implementing embedded system is emphasized.

**b. Pre-requisites, or co-
requisites:** None

6. Specific goals for the course:

a. Specific outcomes of instruction:

Embedded systems are ubiquitous nowadays. The overall course objective is to help the students to understand how embedded systems interact with the external world environment. The course aims to provide hands-on experiences of how an embedded system could be used to solve some daily life problems through automation. The focus will be given to understand basic building blocks of an embedded system instead of complex system design. However, the final project will demonstrate the students ability to design a real-world system using the concepts learned throughout the course.

**b. Explicitly indicate which of the student outcomes listed in Criterion 3 or
any:** None

Brief list of topics to be covered:

1. Embedded Systems
2. Embedded Systems Architecture
3. ARM Machine Language
4. Assembly and C Language Programming
5. I/O Port Interfacing
6. Timer and Phase-Locked Loop (PLL)
7. Finite State Automation
8. I/O Synchronization and Interrupts
9. UART
10. Analog/Digital Conversion (ADC and DAC)