ECE 3362: Microcontrollers

Credit / Contact hours: 3/3

Course coordinator: Brian Nutter

Textbook(s) and/or other required material: The HCS12/9S12: An Introduction to Hardware and Software Interfacing, by Han-Way Huang, ISBN 13: 9781401898120 (Recommended).

Catalog description: Advanced digital systems design and assembly language programming, interfacing, and applications of microcontrollers.

Pre-requisite(s) or co-requisites: ECE 1305 or CS 1411 and ECE 2372 (may be taken concurrently)

Designation: Required

Course learning outcomes: Upon completion of this course, students should be able to

1. Analyze software aspects of digital systems using microprocessors and microcontrollers.
2. Design software aspects of digital systems using microprocessors and microcontrollers.
3. Write and debug assembly language programs.

Student outcomes addressed: a, b, c, e, and k.

Topics covered
Basic Computer Terminology and Information Storage – 4 hours
Mathematics of computers – 2 hours
Elementary computer operations - 2 hours
Introduction to MC9S12DP256, DRAGON12, and Assembler through various projects - 8 hours
Transfer, arithmetic and logic instruction - 2 hours
Branches, stacks, and subroutines - 2 hours
Hardware configuration and interrupts - 3 hours
Basic input/output using ports of 68HC12 - 4 hours
Timing systems of MC9S12DP256 - 4 hours
Pulse width modulation system - 2 hours
Analog to digital system - 1 hour
Serial communication systems - 3 hours
Clocks and reset generator - 2 hour
Tests and reviews - 3 hours

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