

Department of Electrical and Computer Engineering

College of Engineering and Applied Sciences

WESTERN MICHIGAN UNIVERSITY



1903 · 2003

ECE 4510/5530

Microcontroller Applications

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Course/Lecture Overview

- Syllabus and Web Site
- Personal Intro.
- Textbooks Used
- Additional Reading
- ID and Acknowledgment of Policies
- Plan/Schedule for the Course

- Intro

Syllabus and more

- Everything useful for this class can be found on Dr. Bazuin's web site!
 - <http://homepages.wmich.edu/~bazuinb/>
- The class web site is at
 - Lecture/Class
http://homepages.wmich.edu/~bazuinb/ECE4510/ECE4510_Sp13.html
 - Lab
http://homepages.wmich.edu/~bazuinb/ECE4510/ECE4510Lab_Sp13.html
 - The ABET syllabus
http://homepages.wmich.edu/~bazuinb/ECE4510/Syl_4510_ABET.pdf
 - The Full Course syllabus
http://homepages.wmich.edu/~bazuinb/ECE4510/Syl_4510.pdf
http://homepages.wmich.edu/~bazuinb/ECE4510/Syl_5530.pdf
 - Supplemental Information from Dr. Grantner
<http://homepages.wmich.edu/~grantner/ece4510/>
- The password protected solution set and hand-out site
 - https://homepages.wmich.edu/~bazuinb/PasswordMaterial/ECE4510/ECE4510_Solutions.htm
 - Use your Go WMU “Bronco NetID” login and password

Who am I?

- Dr. Bradley J. Bazuin
 - Born and raised in Grand Rapids Michigan (Forest Hills Northern)
 - Undergraduate BS in Engineering and Applied Sciences, Intensive Electrical Engineering, Yale University in 1980
 - Graduate MS and PhD in Electrical Engineering Stanford University in 1982 and 1989.
 - Industrial Experience – digital, ASIC, systems engineering
 - Part-time ARGOSystems, Inc. (purchased by The Boeing Co.) 1981-1989
 - Full-time ARGOSystems, Inc. 1989-1991
 - Full-time Radix Technologies 1991-2000
 - Academic Experience – electrical and computer engineering
 - Term-appointed Faculty, WMU ECE Dept. 2000-2001
 - Tenure track Assistant Professor, WMU ECE Dept. 2001-2007
 - Tenured Associate Professor, WMU ECE Dept. 2007-

Required Textbook and Materials

- *The HCS12/9S12: An Introduction to Software & Hardware Interfacing, 2nd ed.*, Han-Way Huang, Thompson, 2010, ISBN # 1-4354-2742-4.
 - The 1st edition textbook should be acceptable if you have or can get one.
- Adapt9S12DP512 Evaluation Board by Technological Arts
 - Approximately \$150
- ECE 4510 Parts Kit and Solderless Breadboard
 - Approximately \$83
- ICC12 IDE software by ImageCraft
 - Approximately \$50
- A USB Memory stick

Provided Required Materials

- CPU12 Reference manual, Motorola/Freescale
- MC9S12DP256B Device User, Motorola/Freescale
- Materials disseminated using the ECE 4510/ECE5530 Class Web Page (the official media for the class). They include the Instructor's Lecture Notes
- Everything you used in ECE 2510 will be reused, but done much faster!

Recommended Materials

- *The C Programming Language*, 2nd ed., B.W. Kernighan and D.M. Ritchie, Prentice Hall, 1988. ISBN: 0-13-110362-8.
- Essential C – from Stanford web site
<http://cslibrary.stanford.edu/101/EssentialC.pdf>
- Jean L. Labrosse, *MicroC/OS – II The Real Time Kernel*, 2nd ed., CMP Books, ISBN 1-57820-103-9

Supplemental Books

1. Introduction to Embedded Systems: Interfacing to the Freescale 9S12, J.W. Valvano, Cengage Learning, 2010. ISBN: 978-0-495-41137-6.
2. Software and Hardware Engineering, Fredrick M. Cady, and James M. Sibigtroth, OXFORD, 2000, ISBN: 0-19-512469-3.
3. 68HC12 Microcontroller Theory and Applications, Daniel J. Pack, Steven F. Barrett, Prentice Hall, 2002, ISBN 0-13-033776-5.
4. Introduction to Microcontrollers, G. Jack Lipovski, Academic Press, 1999, ISBN: 0-12-451831-1.

Identification and Acknowledgement

- Identification for Grade Posting, Course and University Policies, and Acknowledgement
- Please read, provide a unique identification, sign, date, and return to Dr. Bazuin.

Lab Plan

Date	M 6:30-9:20, R 12:30-3:20	Activity/Other
Intro		No labs 1/7 and 1/10
Lab #1	M 1/14, R 1/17	SW Dev. Env. and Flash Prog
MLK Day	M 1/21	Parallel I/O and SW Delay
Lab #2	R 1/24, M 1/28	Parallel I/O and SW Delay
Lab #3	R 1/31, M 2/4	Polling & Int. and non-TTL
Lab #4	R 2/7, M 2/11	Timer Compare and UART/SCI
Lab #5	R 2/14, M 2/18	Timer Capture and PWM
Project #1 due in Lab	R 2/21, M 2/25	- 1-D ping-pong
Lab #6	R 2/21, M 2/25	uCOS-II
Class Midterm	W 2/27	Spring Break 3/1-3/10
Lab #7	M 3/11, R 3/14	<i>ADC Temperature</i>
Lab #8	M 3/18, R 3/21	<i>DAC waveforms/sound</i>
Project # 2 – ECE 5530 only	M 3/25, R 3/28	- 2x16 LCD Display
Lab #9	M 3/25, R 3/28	<i>Sonar Distance</i>
Lab #10	M 4/1, R 4/4	<i>TBD</i>
Lab #11	M 4/8, R 4/11	<i>CAN</i>
Lab Project	W 4/17	- TBD
Lab Final	M 4/15, R 4/18	
Final Exam	W 4/24 12:30-2:30	

Any Questions ?

On to the Material