

ETec374 Course Syllabus

Course: ETec374 – Microprocessor Applications

Quarter: Winter 2008

Credits: 5

Instructor: Todd Morton

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Office Hours:	Monday	Tuesday	Wednesday	Thursday	Friday
	3-4pm	3-5pm	3-4pm	9-10am, 3-5pm	

Course Description: Upper-division study of microprocessors, support devices, and peripheral equipment and their integration into microcomputer systems. Study of various hardware configurations and interfacing techniques. Application-oriented laboratory experiments and design problems.

Prerequisites: C- or better in ETec274 or CS227, ETec373, EET major or written permission. A working knowledge of digital electronics, familiarity with computer numbering systems, previous exposure to microprocessor architecture and machine language programming.

Texts: Embedded Microcontrollers, Todd Morton (Optional)
CPU12 Reference Manual, Freescale, On S12U Board CD
9S12DG128 Data Sheets and User Guides, Freescale, On S12U Board CD
Reference Guide For D-Bug12 Version 4.x.x, On S12U Board CD

References: 'Embedded Microcomputer Systems', Valvano.
'Microcontroller Technology', Peter Spasov.
'Design with Microcontrollers', John Peatman.
'Software and Hardware Engineering', Frederick Cady.

Software: Freescale CodeWarrior Development System (64K Special Edition)
D-Bug12 Debugger

Internet Resources:

Email Listserv: etec374@etec.wwu.edu

EET Web Site: <http://eet.etec.wwu.edu>

Student Work and Evaluation:

One 2-hour Exam ~20%
One Final ~30%
Homework, Quizzes ~10%
Laboratory/Code Reviews ~40%

Homework Policy:

No late homework is accepted. Solutions are handed out on the due date.

Lab Policy:

Points possible: 10pts for 1-week labs, 15pts for 2-week labs.

Late penalty: -5% per day late.

Maximum late penalty: -50%

Plagiarism: All lab programs must be written individually. The University plagiarism rules are strictly enforced in this course. Plagiarized material can result in loss of all laboratory points or an F for the course. (Refer to 'Appendix D - Academic Dishonesty Policy and Procedure' in Western's 2006-2007 Bulletin)

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Schedule *(Subject to Change)*

Jan 8: Microcomputer Concepts, CPU, Bus System
Handout Syllabus and Homework 1
Text: Chapter 1

Jan 9: Memory Maps and Devices, IO Devices, The
9S12 MCU.

Jan 10: Software Development and Construction,
Lab System Demonstration

Jan 11: Lab1 – Software Development Introduction

Jan 15: Assembly Language programming, Syntax,
Directives, Programming Model.
Text: 2-3, 4, 5.1-5.5

Jan 16: Addressing Modes

Jan 17: Data Transfer, Bit & Arithmetic Instructions

Jan 18: Lab2 – Basic GPIO
Homework1 due, Handout Homework2

Jan 22: Program Flow Instructions
Text: 6.1-6.5

Jan 23: Subroutines, Position Independence

Jan 24: Lab3 – ADC Bar Graph

Jan 25: Structured Programming, Flow Diagrams
Homework2 Due, Handout Homework3

Jan 29: Structured Constructs, Data Objects

Jan 30: Program Structure, Parameter Passing, Software
Delays.
Text: 7

Jan 31: Final Product Development
Text: 10
Code Reviews

Feb 1: Data Type conversions, Basic I/O.
Homework3 Due, Handout Homework4

Feb 5: Basic I/O.

Feb 6: Basic I/O, Midterm Review
Homework 4 due

Feb 7: Midterm

Feb 8: Midterm Solutions
Fixed-Point Arithmetic Programming
Handout Homework 5

Feb 12: Fixed-Point Arithmetic Programming

Feb 13: Real-time Programming, Multitasking
Text: 8.1-8.6

Feb 14: Lab 4 – Memory Test w/ User Interface

Feb 15: Real-time Programming, Multitasking
Text: 8.1-8.6
Homework5 Due, Handout Homework6

Feb 19: Real-time Programming, CPU12 Interrupts

Feb 20: Interrupt Handling Final Product Design

Feb 21: Final Product Design, BDM-based Debugging.

Feb 22: Lab5 – Standalone Timeslicer

Feb 26: 9S12 Enhanced Timer
Text: 9

Feb 27: 9S12 Enhanced Timer

Feb 28: 9S12 SCI, 9S12 SPI
Text: 9

Feb 29: 9S12 SPI, Master/Slave Software
Homework6 Due, Handout Homework7

Mar 4: 9S12 SPI Timing, IIC
Text: 9

Mar 5: 9S12 ADC, Sampling

Mar 6: Code Reviews

Mar 7: DAC w/ PWM, SPI

Mar 11: EEPROM Programming

Mar 12: CAN

Mar 13: Lab6 – Security System

Mar 14: Final Review
Homework 7 Due

Wed, Mar 19: Final, 8:00-10:00am
