STATE UNIVERSITY OF NEW YORK COLLEGE AT NEW PALTZ

DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING

EGC331 – MICROPROCESSOR SYSTEM DESIGN – SPRING 2012

COURSE SYLLABUS

INSTRUCTOR: MICHAEL OTIS

OFFICE: REH 201

OFFICE HOURS: Monday: 9:50 am – 10:50 am

Tuesday: 9:50 am – 10:50 am

Thursday: 9:50 am – 10:50 am

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COURSE DESCRIPTION:

An introduction to microprocessor systems design. Topics include microprocessor organization; microcontroller architecture; assembly and C language programming; branch, call, loop, I/O port, arithmetic, logic, indexed, and look-up table programming; digital and analog interfacing; and on-board timer.

PRE-REQUISITES:

EGC230 – Digital Logic Fundamentals

EGC208 – Digital Laboratory

CO-REQUISITE:

EGC308 – Microprocessor Laboratory

TEXTBOOK:

HCS12 Microcontroller and Embedded Systems, Using Assembly and C with CodeWarrior, by Muhammad Ali Mazidi and Danny Causey, Pearson/Prentice Hall Publishing, 2009. ISBN: 0-13-607229-1

GRADING:

* Exam 1    20%
* Exam 2    20%
* Final Exam              20%
* Project 30%
* Homework/Quizzes 10%

COURSE OUTLINE:

**1. Intro to Computing.**

Microprocessor organization. Memory and I/O interfacing.

**2. HCS12 Architecture.**

System architecture. Memory map. Addressing modes. Condition Code Register (flags.)

**3. Assembly Language Programming.**

Data format and directives. Stack and data transfer. Branch and loop, and jump and call instructions. Indexed addressing.

**4. ‘C’ Programming.**

Data types. Time delays.

**5. I/O Port Programming.**

Interfacing and I/O bit manipulation.

**6. Arithmetic and Logic Operations.**

Arithmetic, logic, compare, rotate, and shift instructions. Signed numbers.

**7. Advanced Assembly Techniques.**

Advanced indexed addressing modes. Look-up tables.

**8. Interfacing.**

LCD and keypad interfacing.

**10. Analog-to-Digital Conversion.**

Simple non-interrupt based Analog-to-Digital Conversion. Variable analog voltage measurement.

**11. Timer.**

Simple non-interrupt based Output Compare and Input Capture. DC Motor RPM measurement.

**12. Pulse Width Modulation.**

Simple non-interrupt based Pulse Width Modulation. DC Motor speed control.

COURSE PROJECT:

Using a hierarchical approach and Freescale’s Codewarrior and Evaluation Board, design and verify (through simulation and implementation) a microprocessor-based motor instrumentation and control system.

POLICIES:

* **ADA Policy:** If you have documented disabilities, inform the instructor privately during the first week of class and make proper arrangements. Refer to the Student Handbook for SUNY New Paltz policies.
* **Attendance:** You are expected to attend lectures on a regular basis. In case of absence, it is your responsibility to obtain notes from your fellow classmates, not from the instructor.
* **Missed Coursework:** All coursework is your responsibility. There are no excuses for handing in coursework late. Coursework will be graded as late if not handed in on the due time/date, which is at the beginning of the class period on the due date. Coursework will be penalized one letter grade each day it is late.
* **Rescheduling:** There is no rescheduling unless emergencies arise related to medical or family matters. Rescheduling is contingent on the student presenting both documentation describing the reason(s) for the absence and contact information for the person providing the document(s).
* **Plagiarism:** Submitting material that is not your own work, including internet materials, is considered plagiarism, and will result in a failing mark and a report to the department chair and dean. Quoted material must be correctly cited. Refer to the Student Handbook section on Academic Integrity for a full discussion of policies on plagiarism, cheating, and forgery.