SAULT COLLEGE OF APPLIED ARTS & TECHNOLOGY
SAULT STE MARIE, ON

COURSE OUTLINE

Course Title: COMPUTER INTERFACING

Code No.: ELN302   **Semester**: 6

Program: ELECTRICAL/ELECTRONICS ENG. TECHNOLOGY

Author: Doug Faggetter

Date: Jan. 2000   **Previous Outline Date**: Jan. 1999

Approved: _____ _____
                        Dean   Date

Total Credits: 5   **Prerequisite(s)**: CET228, CET331
Length of Course: 16   **Total Credit Hours**: 80

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COMPUTER INTERFACING   ELN302

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I.   COURSE DESCRIPTION:

Students will study the architecture and programming of microcontrollers in computer interfacing applications. Lab activities involving computer interfacing to hardware and the associated software requirements will support the theory.

II.   LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE:

Upon successful completion of this course the student will demonstrate the ability to:

1)   Identify the major components in the architecture of a mircocontroller.

      Potential Elements of the Performance:
      - Identify the elements of the block diagram of the M68HC11 microcontroller.

2)   Identify and describe the function of the various registers in a microcontroller.

      Potential Elements of the Performance:
      - Identify and describe the function of the accumulators, index registers, stack pointer,
        program counter and other registers in the M68HC11.

3)   Use the instruction set of the microcontroller to write assembly language programs.

      Potential Elements of the Performance:
      - Write the source code for various M68HC11 programs.
      - Assemble the code.
      - Download the S-record file to the M68HC11 evaluation board.
      - Run the program.

4)   Use the on-board debug monitor program of the microcontroller.

      Potential Elements of the Performance:
      - Use the BUFFALO monitor to perform various functions in the program development
        and debugging phase.

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II.   LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE (Continued)

5)   Interface analog signals to the microcontroller.

Potential Elements of the Performance:
- Use the M68HC11 analog-to-digital converter in the analog interface process.

6)   Access the microcontroller peripherals and timer.

Potential Elements of the Performance:
- Write and test M68HC11 code to perform a variety of interfacing functions in the lab.

7)   Program the microcontroller using a high-level language.

Potential Elements of the Performance:
- Use a "C" compiler for the M68HC11 to write a program for the evaluation board.

III.   TOPICS:

1)   M68HC11 Microcontroller

2)   MHC6811 Registers and Addressing Modes

3)   M68HC11 Instruction Set

4)   Evaluation Board Monitor Commands

5)   Interfacing Analog Signals

6)   Output Peripherals

IV.   REQUIRED RESOURCES/TEXTS/MATERIALS:
Data Acquisition and Process Control with the M68HC11 Microcontroller
by F.F. Driscoll, R.F. Coughlin, and R.S. Villanucci

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V. EVALUATION PROCESS/GRADING SYSTEM

The grading weight will be:
Theory   75%
Lab   25%

The grading system will be as follows:

A+   90% - 100%   Outstanding Achievement
A   80% - 89%   Above Average Achievement
B   70% - 79%   Average Achievement
C   60% - 69%   Satisfactory Achievement
R   below 60%   Repeat

VI. SPECIAL NOTES:

-   Special Needs
    If you are a student with special needs (eg. physical limitations, visual impairments,
    hearing impairments, learning disabilities), you are encouraged to discuss required
    accommodations with the instructor and/or contact the Special Needs Office, Room
    E1204, Ext. 493, 717, 491 so that support services can be arranged for you.

-   Retention of Course Outlines
    It is the responsibility of the student to retain all course outlines for possible future
    use in acquiring advanced standing at other post-secondary institutions.

-   Substitute Course Information is available at the Registrar's Office.

VII. PRIOR LEARNING ASSESSMENT

Students who wish to apply for advanced credit in the course should consult the
instructor.