University of Wisconsin Platteville
Department of Electrical and Computer Engineering

Course Syllabus **EE 3780 - Introduction to Microprocessors** **Fall 2018**

Instructor

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Lecture Sessions

Monday, Wednesday, and Friday: 1.00 p.m.-1.50 p.m. Engineering Hall, Room-0115

Laboratory - L1, L2, L3, and L4

Laboratory- L1: Tuesday,	2.00 p.m.-2.50 p.m.;	Engineering Hall 0310
Laboratory- L2: Thursday,	2.00 p.m.-2.50 p.m.;	Engineering Hall 0310
Laboratory- L3: Tuesday,	1.00 p.m.-1.50 p.m.;	Engineering Hall 0310
Laboratory- L4: Thursday,	1.00 p.m.-1.50 p.m.;	Engineering Hall 0310

Lab access during off hours:

Monday – Friday: 7:00-19:00 (open); 19:00-23:00 (card); 23:00-7:00 (closed)
Weekend: 9:00-17:00 (card); 17:00-9:00 (closed)

Office Hours - Spring 2018

Time	Monday	Tuesday	Wednesday	Thursday	Friday
8.00AM	EE 1210 - B - Lecture	EE 1210 - B1 - Lab	EE 1210 - B - Lecture	EE 1210 – B2 - Lab	EE 1210 - B - Lecture
9.00AM	Office Hour		Office Hour		Office Hour
10.00AM	Office Hour		ECE Faculty Meeting	EE 1020 - 04 - Lab	Office Hour
11.00AM					
12.00PM					
1.00PM	EE 3780 - 01 Lecture	EE 3780 - L3 - Lab	EE 3780 - 01 Lecture	EE 3780 – L4 - Lab	EE 3780 - 01 Lecture
2.00PM		EE 3780 – L1 - Lab	Office Hour	EE 3780 – L2 - Lab	
3.00PM	EE 1020 - 02 - Lab	Office Hour		Office Hour	
4.00PM		Office Hour		Office Hour	
5.00PM		Office Hour – PSV/PSL		Office Hour – PSV/PSL	

Updated office hour will be available on D2L. Students can also meet me any other times by appointment.

Topics Covered & Prerequisites

Introduction to microprocessor assembly language programming. Fundamentals of microprocessor architecture, data representation, and arithmetic. System debugging. Interfacing and interrupts. Microprocessor- and microcontroller-based system design, testing, and implementation.

Prerequisites: "C-" or better in COMPUTER 1430 and ELECTENG 3770.

Textbooks

HCS12/9S12: An Introduction to Software & Hardware Interfacing (2nd Edition) by Han-Way Huang, Delmar Cengage Learning, 2010.

Expected Learning Outcomes

1. Knowledge of a microprocessor memory system, I/O system, interrupts, serial ports, and parallel ports (1 and 7).
2. Ability to interface the single-board computer to external devices with parallel ports, and interrupt controller (1, 2, and 6).
3. Ability to use assembler tools and ROM programming tools and to download programs into embedded systems (1, 2, and 6).
4. Ability to write well-structured assembly programs (1, 2, and 6).
5. Ability to understand the timing relationships of address BUS, data BUS, and critical control signals of a micro-controller or microprocessor (1).
6. Ability to write reports and to do internal and external documentation (1, 2, 3, 4, and 6).
7. Ability to give good oral presentations (3 and 4).
8. Ability to work in engineering groups (5).

Associated Program Outcomes

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3. An ability to communicate effectively with a range of audiences
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies

Course Outline

1. Introduction to microprocessor operation
2. HCS12 assembly programming and architecture
3. Memory interface design
4. Parallel data transfer
5. Timer
6. Interrupts and applications
7. HCS12 embedded system
8. HCS12 micro-controller interface design
9. Embedded system applications

→ 1/2 Midterm Exam (~ middle and end of the semester)

→ Final Exam

Grading Policy

Grading Criteria's:

1. Quizzes and Homework's (20%)
2. Midterm examinations (20%)
3. Laboratory assignments (20%)
4. Final project (20%),
5. Final exam (20%).

Grading Scales:

A = 4.00 (>93.0%)	B+ = 3.30 (87.0-89.9%)	C+ = 2.30 (77-79.9%)	D+ = 1.30 (67-69.9%)
A- = 3.70 (90.0-92.9%)	B = 3.00 (83.0-86.9%)	C = 2.00 (73-76.9%)	D = 1.00 (60-66.9%)
	B- = 2.70 (80.0-82.9%)	C- = 1.70 (70.0-72.9%)	F = 0.00 (<60%)

— Grades on individual pieces of work will be posted on D2L. Unless otherwise indicated, grades reported on D2L represents only the score for each individual piece of work. Any computation of grades performed by the D2L software should be disregarded. Course grades can be determined by the formula given in the syllabus. The instructor's grading spreadsheet contains the only copy of official grades.

— The instructor reserves the right to adjust everyone's final grade by ±5% based upon the instructor's assessment of the student's ability and performance.

Desire2Learn (D2L)

Materials for this course can be found on D2L. To access D2L, go to: www.uwplatt.edu/Desire2learn/ Click the Log In with NetID button and enter your username and password (the same that you use for email). Courses are arranged in order by semester. Scroll down the page to locate this course and click on the link. Course materials can be found by clicking on the Content link. If you need assistance with Desire2Learn, please contact the Helpdesk 608-342-1400 or email helpdesk@uwplatt.edu.

Homework

Homework will consist of assigned problems from textbooks. Any question from homework will be answered during the lecture times or during the office hours. All the homework will be considered in your grade, and it is strongly recommend that you complete ALL the homework. The presentation of all the completed homework assigned prior to each exam is required to make any appeal on the exam grade.

- All homework submissions will be on D2L through Dropbox within the due time.
- All Dropbox submissions must be in pdf (**all other submission format will get zero**) .
- Homework must be completed in a neat and orderly fashion, using only one side of the sheet of paper with enough work shown that the solution can be easily followed. **No credits will be given if you just copy the answer without any reasonable derivation or explanation unless permission has been given in the assignment sheet.**
- Your name and section number must be at the upper right hand corner of the first page
- If there are multiple pages, add them in a single pdf file.
- Both the assignment number and the problems included must be listed below your name on the first page.
- Each problem in the assignment must be clearly labeled.

Exams

There will be 1 or 2 midterm examinations and one comprehensive final exam**. Student must participate each exam for passing grade** and each exam date will be announced ahead of time. Any material presented in the homework, laboratory or lecture prior to any test day may be on the test. Make-up examinations will be offered only for a severe medical or personal issue with proper documentations.

Labs and Lab Reports

1. **There will be four laboratory projects and all labs must be completed to receive a passing grade for this course.**
2. Labs will be conducted in groups (groups will be formed at the beginning of the semester during Lab 0).
3. Each group must complete lab projects independently and check them off with the lab instructor. Lab check-offs will consist of demonstrating the functional code and answering related questions.
4. Students are fully responsible for the complete lab design procedure, including trouble-shooting (which is one of the course objectives).
5. Lab reports are expected to be technical reports and shall be prepared in groups (one report submission per group).
6. Lab reports must follow the Informal Lab Report style described in the EE department Lab Report Format, see below

   https://www.uwplatt.edu/files/college-of-ems/PDFs/electrical_engineering_report_formats.pdf
7. Student must submit their lab report on D2L through Dropbox within the due time.
8. All Dropbox submissions must be in pdf (other submission format will get zero)
9. If there are multiple pages, add them in a single pdf file.

Lab grades will be based on the followings:

1. Reports will be graded based on the completion of lab objectives and upon making non-trivial observations about the lab.
2. Demonstration of observations to the instructor in the laboratory. Your observations must support by the analytical tools covered in the lectures, simulations and documentation of plots, etc. The instructor may ask the student questions to make sure he/she understands the contents covered in the lab.
3. Overall quality of the written report. [Objectives must be clearly stated].

Project

The final project will include a proposal, an oral presentation of PowerPoint slides to the class, and a formal report. Design projects will be performed in groups where all group members will participate equally in all stages of the project. **You must complete your project to pass this course.** Design project reports must follow the Formal Lab Report style described in the EE department Lab Report Format, see https://www.uwplatt.edu/files/college-of-ems/PDFs/electrical_engineering_report_formats.pdf

Attendance Policy

Class attendance is not mandatory but strongly recommended. Since, we will do example problems, group works, and random quizzes, so attendance will strongly influence your grade. You are responsible for materials covered in classes you missed, and you should get copies of notes from the students who were present.

Late Submission Policy

Student must follow the due dates for any submission (e.g., homework, quiz, and lab report, etc.) and no late submission will be accepted unless it's an emergence (e.g., family emergence or health issues). In case of emergence, student must contact the instructor immediately and submit sufficient proof for that (e.g., medical report or doctor visit etc.). For any circumstances, student must avoid the following excuses:

1. Somehow forget the due date and looking for the extended due date.
2. Mistakenly submit work from another course and want to resubmit.
3. Submit only one page and forget to add all pages as a mistake.
4. No health issue excuse without proper documents.
5. Prepare for the exam for other courses and looking for the extended due date.
6. If you cannot submit it online because of any technical error, you must show the exact error message as a proof.
7. You submit it online, but it's not showing as an error.

Academic Misconduct

Cheating on any assignment will result in a reduction of the students' grade or dismissal from the course. Any submitted work with an overwhelming similarity between two or more students work will be deemed as plagiarism, and only 50% of the lowest point given among the similar works will be distributed between the grades of those with the similar works. **Studying in a college is an honor for everyone, and every credit, he/she earned must result from his/her own efforts**.

Religious Observances

Students have the right to miss class for religious observances. Students wishing time off for this reason should let the instructor know within the first two days of class.

SSWD/Special Accommodations

If you need an accommodation due to a disability, please make an appointment to see me during my office hours. A VISA from Services for Students with Disabilities authorizing your accommodations will be needed. Contact 608-342-1818 for more information about SSWD.

Computer Use

- MiniIDE – integrated development environment for assembly programming of Motorola 68HC11/12.