

ET 386
Introduction to Microprocessors

ET-386 - 01 (1284)
Monday 5:00PM - 6:50PM
Room: ET-113

ET-386L - 01 (1285)
Monday 7:00PM - 9:45PM
Room: ET-113

Instructor: William E. Lopez
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Personal webpage: www.welopez.com

Mode of delivery: In Person

Textbook: Technicians Guide to the 68HC11 Microcontroller
Daniel J. Black
ISBN: 07668-17156

Hardware: Motorola 68HC11 EVBU
Software: Minilde, JBUG 11

Grades are based on tests, homework
and attendance as follows:

(2) Tests: 33%
Homework: 33%
Attendance: 33%

Letter grades are as follows:

90-100%	A
80-89%	B
70-79%	C
60-69%	D
00-59%	F

Homework Assignments:

Ch. 1 Intro to Computer Hardware pg. 24 Ques. 1-29 odd
Ch. 2 Intro. to Computer Software pg. 49 Ques. 1-25 odd
Ch. 3 68HC11 Programming pg. 88 Ques. 1-31 odd
Ch. 4 Branching and Loops pg. 114 Ques. 1-22 odd
Ch. 5 Indexing through Memory pg. 133 Ques. 1-6 odd
Ch. 6 Subroutines pg. 157 Ques. 1-21 odd
Ch. 7 Working with an Assembler pg. 171 Ques. 1-11 odd
Ch. 8 Memory Systems pg. 192 Ques. 1-25 odd
Ch. 9 General Purpose I/O pg. 212 Ques. 1-23 odd
Ch. 10 68HC11 Interrupts and Resets pg. 262 Ques. 1-27 odd
Ch. 11 Analog Capture Port E pg. 262 Ques. 1-27 odd
Ch. 12 Timer Events Port A pg. 293 Ques. 1-43 odd
Ch. 13 Serial Communications Port D pg. 315 Ques. 1-25 odd

ET 386L

Grades are based on completed labs, tests and attendance
as follows:

(2) Tests: 33%
(15) Labs: 33%
Attendance: 33%

Lab 1 Intro. to 68HC11, JBUG11, Minilde, Immediate
Addressing Mode

Lab 2 Trace Method, Accumulators, Program Counter

Lab 3 Direct Addressing, FCB, RMB, Labels

Lab 4 Multiplication, CLRA, CLRB, NOP, Double
Accumulator, Inherent Addressing

Lab 5 Output Operations, Port B, Timing Loops,
Index Register X

Lab 6 Output Operations, Machine Cycles

Lab 7 Input Operations, Port E

Lab 8 Comparison, Subroutines, Rotations, Shifts

Lab 9 Index Addressing

Lab 10 Sound, Driving Loads

Lab 11 D.C. Motors, Pulse Width Modulation

Lab 12 Stepper Motors, Port C, Data Direction Register C

Lab 13 Analog to Digital Conversions, Port E

Lab 14 Part 1 Timer Events, Port A
 Part 2 Pulse Accumulation, Port A
 Part 3 Output Compare, Port A

Lab 15 Port D Serial Communication

Lab 16 External Hardware Interrupts

Course Objective

This course is built around the Motorola 68HC11 Evaluation Board (EVBU.) The course is a combination of hardware and software. External electronic circuits will be interfaced to the microprocessor and then an Assembly language program will be created to achieve control of the external circuits. Programming will be performed in a software package called JBUG11 for Windows. All programming will be done on laptops which will be provided by the instructor. Electronic components and integrated circuits will also be provided.

The lecture section includes readings from the textbook, homework and tests. The lab section will consist of hands-on work but each lab will require a written report. Both sections will require calculations involving frequency and time. Also, there will be constant use of decimal, binary and hexadecimal number systems.

The preceding page contains more details on grading policy, homework and lab assignments. The student should have small tools for working on the various external electronic circuits. And finally, the student should have a scientific calculator for working with different number systems.

ABET Student Outcomes

The course satisfies following [ABET](#) student 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 Structure and Delivery Mode: The class is in person. Contact the instructor by e-mail or text. All class materials are contained in my personal webpage: www.welopez.com I will send e-mails with assignments, labs and other information.

Office hours:

Fall Semester:

Monday	4:30-5:00 PM; 9:45-10:15 PM	Room ET-113
Tuesday	4:30-5:00 PM; 9:45-10:15 PM	Room ET-113
Wednesday	4:30-5:00 PM; 9:45-10:15 PM	Room ET-113
Friday	2:00-2:30 PM; 4:45-5:30 PM	Room ET-113

Spring Semester:

Monday	4:30-5:00 PM; 9:45-10:15 PM	Room ET-113
Tuesday	4:30-5:00 PM; 9:45-10:15 PM	Room ET-113
Wednesday	4:30-5:00 PM; 9:45-10:15 PM	Room ET-113
Friday	4:30-5:00 PM; 9:45-10:15 PM	Room ET-113

Plagiarism/Academic Integrity Policy

*There is **zero tolerance** for cheating, plagiarism, or any other act of violation of Academic Integrity policy. Work that you submit is assumed to be original unless your source material is documented appropriately, using proper citation. Using the ideas or words of another person, even a peer, or a web site, as if it were your own, is plagiarism. Any individual or group caught cheating on homework, lab assignments, or any exam/quiz will be subjected to full extent of academic actions allowed under University regulations. At a minimum, any student caught violating Academic Integrity Policy will receive no credit for the work concerned and one grade lower letter grade. To learn more about the University policy on Cheating and Plagiarism, visit:*

[Academic Information and Regulations-Cheating and Plagiarism](#)

University Withdrawal Policy

Class withdrawals during the final 3 weeks of instruction are not permitted except for a very serious and compelling reason such as accident or serious injury that is clearly beyond the student's control and the assignment of an Incomplete grade is inappropriate (see [Grades](#)). Application for withdrawal from CSULB or from a class must be filed by the student [online](#) whether the student has ever attended the class or not; otherwise, the student will receive a grade of "WU" (unauthorized withdrawal) in the course. More information regarding the University guidelines on Dropping and Withdrawing at:

[Dropping and Withdrawal](#)

Student Grievance Policy

Please check CSULB grievance policy and procedure at:

[Student Grievance Procedures](#)

Special Needs Accommodations

Online courses are required to meet ADA accessibility guidelines. Students with a disability or medical restriction who are requesting a classroom accommodation should contact the [Bob Murphy Access Center \(BMAC\) and also notify the instructor](#). BMAC personnel will work with the student to identify a reasonable accommodation in partnership with appropriate academic offices and medical providers. Only approved BMAC petitions will be accommodated.

Any student who is facing academic or personal challenges due to difficulty in affording groceries/food and/or lacking a safe and stable living environment is urged to contact the [CSULB Student Emergency Intervention & Wellness Program](#). Additional resources are available via [Basic Needs Program](#). The students can also email supportingstudents@csulb.edu, call (562)985-2038, or if comfortable, reach out to the instructors as they may be able to identify additional resources. For mental health assistance please check out [CSULB Counseling and Psychological Services \(CAPS\)](#).

Emergency Preparedness

Students are strongly encouraged to familiarize themselves with the [Personal Preparedness Instructions](#) and other resources under “Emergency Preparedness” link on [CSULB University Police web site](#).

Disclaimer

In the event of extraordinary circumstances beyond the University's control, the content and/or evaluation scheme in this course is subject to change.

Additional Information

Technology Requirements

Please contact the department if you need support with access to the Internet, electronic devices, or any other issues related to remotely accessing your course.

Tutoring

Take advantage of free peer tutoring (virtual) provided by Engineering Student Success Center (ESSC): [Engineering Tutoring](#)

Additional Resources

There are many services on campus to help you achieve success in your courses. Links to the following services are also available in BeachBoard course homepage under “CSULB Student Resources”:

- [Counseling and Psychological \(CAPS\)](#)
- [Disabled Student Services](#)
- [Enrollment Services](#)
- [Financial Aid](#)
- [Learning Assistance Center](#)
- [Student Health Services](#)
- [Tutoring at CSULB](#)
- [University Library](#)
- [Writers Resource Lab](#)

Student Feedback about the Course

*Student Feedback is highly encouraged. Please feel free to contact the instructor to share any concern or opinion about the course throughout the semester and participate in the **anonymous survey**. Early Feedback will provide the instructor the opportunity to address your concern and implement required modifications in a timely manner.*

Personal Assistance

Any student who is facing academic or personal challenges due to difficulty in affording groceries/food and/or lacking a safe and stable living environment is urged to contact the [CSULB Student Emergency Intervention & Wellness Program](#). Additional resources are available via [Basic Needs Program](#). The students can also email supportingstudents@csulb.edu, call (562)985-2038, or if comfortable, reach out to the instructors as they may be able to identify additional resources