ET 386
Introduction to Microprocessors

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 consists 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 following 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.

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

Hardware: Motorola 68HC11 EVBU
Software: 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

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Grades are based on completed labs and attendance as follows:

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

Lab 1 Intro. to 68HC11, JBUG11, ASMHC11 Assembler, Immediate Addressing

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