COURSE: PREFIX NO. | EFFECTIVE DATE | NEXT REVIEW DATE
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EEM 242 | Spring 2014 | Spring 2016

TITLE: CREDITS | CONTACTS
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Microprocessors II | 3.0 | 2.0 3.0 3.0

PREREQUISITES: EEM 241

DESCRIPTION: This course is a continuation of the study of microprocessor programming and interfacing techniques.

TEXTBOOK(S) OR ALTERNATIVE: Microprocessor Interfacing and Applications by Heathkit. Pdfs for textbook will be given.

MATERIALS (specifying those to be purchased by student):
Materials provided are course outline and lab equipment. Students will provide textbook, lab manual, paper, pencils, and a scientific calculator.

COLLATERAL READING:

CLASS MANAGEMENT ACTIVITIES (Attendance, tardies, testing, etc.):

ACADEMIC DISHONESTY:
Students are expected to do their own work. Please refer to the NETC Student Code and Grievance Procedure for definition of academic dishonesty and an outline of disciplinary action that may result therefrom.

ATTENDANCE:
Students are expected to attend all scheduled classes, however, up to 10 hours of absence are allowed for unavoidable hardships such as illness or car trouble. A student missing more than 10 hours of class for any reason will be dropped from the course for excessive absences. A grade of "W" will be assigned if a student drops, or is dropped from a class prior to mid-term. After mid-term, a grade of "WF" is assigned unless there are extenuating circumstances and the student is passing the course at the time of withdrawal.

TARDIES:
A student is considered tardy if he or she arrives for class after the roll has been taken. Three tardies constitute 1 hour of absence.

ASSIGNED WORK:
If a student is absent the day an assignment (test and/or homework) is due, he/she is required to complete the work on the first day back in class.

CLASSROOM ETIQUETTE:
An integral part of an education is developing a sense of integrity and responsibility not only toward you but also toward others. In the classroom, as on the job or in your home, exhibiting
appropriate behavior reflects on your maturity. Arriving on time to class, being prepared, and considerate of others as they are talking has a positive effect on others. Please be considerate.

Electronic communication devices such as pagers and phones should be turned off or muted during class time.

STUDENT ID:
It is mandatory that every student wear his or her student ID at all times. During the first week of classes, the instructor will issue a reminder to wear the ID. This reminder is a warning.

Then instructors are required to dismiss students without ID from class. The student may get his/her ID (or a new one from Student Services for $3.00) and return to class before the midpoint of the class. If the student cannot get his/her ID and return to class by the midpoint, the instructor will record the absence.

DISABILITIES STATEMENT:
Students with disabilities are encouraged to contact the Dean of Student Services to discuss needs or concerns as they pursue and academic program and participate in campus life. The Dean of Student Services will provide guidance regarding official documentation of disabilities and/or accommodation of needs. (See College Catalog)

RESOURCES (A-V, persons, tools/equipment):
ETW 3800 Trainer by Heathkit

COURSE TOPICAL OUTLINE (List topics and sub-topics of course) and Calendar or approximate length of time devoted to topic.

TENTATIVE OUTLINE

UNIT 1 INTERFACING BASICS AND THE 68HC11
a. Interfacing Fundamentals
b. Interfacing with Switches and Displays
c. Labs 1, 2, and 3

UNIT 2 A PROGRAMMABLE INTERFACE DEVICE-THE PIA
a. Peripheral Interface Adapter
b. Using the PIA
c. I/O Control
d. Labs 4, 5, and 6

UNITS 3, 4, AND 5 ARE OPTIONAL

UNIT 6 ANALOG CONVERTER INTERFACING AND APPLICATIONS
a. Interfacing to D/A Converters
b. Interfacing to A/D Converters
c. Applications Using DAC and ADC
d. Labs 11, 12, and 13
UNIT 7  TEMPERATURE AND OPTICAL SENSING  
a. Sensing Temperature  
b. Optical Sensing  
c. Labs 14 and 15  

UNIT 8  POSITION, PROXIMITY AND FORCE SENSING  
a. Sensing Position and Proximity  
b. Force Sensing  
c. Labs 16 and 17  

UNIT 9  CONTROL DEVICES AND CIRCUITS  
a. Control Devices and Circuits  
b. MPU Control of DC Motors  
c. Labs 18 and 19  

UNIT 10  MICROPROCESSOR APPLICATIONS  
a. Consumer Applications  
b. Industrial Applications  
c. Business Applications  
d. Lab Project  

STUDENT LEARNING OUTCOMES:  Upon completion of this course, the student will have demonstrated the ability to:  

1. Interface a representative microprocessor to the "outside world".  
2. Input and Output parallel and serial data through a PIA.  
3. Use a peripheral interface adapter to provide handshake control of parallel I/O operations.  
4. Interface digital-to-analog and analog-to-digital converters to a microprocessor system.  
5. Develop the software and hardware required to allow a Microprocessor to measure motion, force, pressure, flow, and level.  
6. Develop an understanding of how microprocessors are used in applications around the home and industry.  

INSTRUCTIONAL METHODS TO COMPLETE OUTCOMES:  
Classroom lectures  
Demonstrations  
Textbook assignments  
Lab experiments  

EVALUATIVE METHODS TO APPRAISE OUTCOMES:  
Five to seven unit tests will be given. The unit tests average will constitute 80% of the course grade with 20% assigned to labs.  

GRADING SCALE:  
90 - 100 = A  
80 - 89 = B  
70 - 79 = C  
60 - 69 = D  
Below 60 = F