

MAYLAND COMMUNITY COLLEGE



ELN 233 20
01-07-07

PO Box 547
or
200 Mayland Drive
Spruce Pine, NC 28777
828-765-7351 or 1-800-462-9526
mayland.cc.nc.us

**MAYLAND COMMUNITY COLLEGE
Welcomes You To:**

**ELN 233 20
Microprocessor Systems
Credit: 4 Contact: 6**

Course Description

This course covers the application and design of microprocessor control systems. Topics include control and interfacing of systems using AD/DA, serial/parallel I/O, communication protocols, and other related applications. Upon completion, students should be able to design, construct, program, verify, analyze, and troubleshoot fundamental microprocessor interface and control circuits using related equipment.

Prerequisites: ELN 232

Corequisites :

Instructor Information

Instructor: David Pittman
Office Location: 103b
Telephone Number: 765-7351 ext. 284
E-mail Address: dpittman@mayland.edu
Office Hours: Tuesdays & Thursdays 10:30 – 11:00
Wednesdays 4:00 – 5:00
Fridays 9:00 – 11:00

Course Information

Course meetings: Mondays 4:00 – 9:50

Required Text(s): **The Intel Microprocessors, Architecture Programming, And Interfacing, 7th ed., Barry B. Brey, Pearson Publishing**

LRC Resources: none

Required supplies: TI 36X calculator

Course Objectives/Competencies:

The development of the microprocessor has revolutionized every major area of electronics. In this class we will begin the study of the microprocessor interfacing. This means that after this class you will be able to, identify, analyze and describe:

1. Use of a computer to control, analyze and condition “real world” data, sensors and controllers.
2. Control LED's and stepper motors with an 8255.
3. Use of the 8253 to control and measure events.
4. Direct memory access using the 8273.
5. Expanding interrupts using an 8259.

Attendance Policy/Tardiness/Make-Up Work:

Prompt and continual attendance is required. All assignments are due 'on time'. Students will receive a zero for any assignment not turned in on time. As for a missed exam, a makeup opportunity will not be allowed, except for authorized excuses (such as notes from a doctor or hospital, proof will be required).

Grading Criteria/Tests/Projects:

Tests	50%
Homework/Lab	50%

Grading Scale:

A =>90
B =>80 < 90
C =>70 < 80
D =>60 < 70
F <60

Inclement Weather Procedures:

If we experience dangerous weather conditions do not risk your safety to attend class. Any classes that are missed due to weather will be made up, at a time that is satisfactory to all.

Academic Standards/Student Expectations/Ethics:

Do your own work. Be cordial to and respectful of your classmates. If you cheat on a test, copy someone's homework, or exhibit unethical behavior; you will be subject to one or more of the following: (1) No credit for the assignment/exam and/or (2) removal from the course. If you wish to contest any assertion of failure to meeting academic standards, you may exercise the due process options listed in the Student Handbook.

Withdrawal Dates:

End of unconditional withdrawal: February 13, 2007
End of conditional withdrawal: March 27, 2007

ACADEMIC WITHDRAWAL STATEMENT:

If a student has not been in contact with the instructor and has not attended class for a consecutive two-week period, an administrative withdrawal will be submitted by the instructor.

ADA Statement

Any student requesting special accommodations for this course due to a disability should apply for services through the SOAR Office or the Counseling Center, which will document the disability. A counselor will then help determine which accommodations, if any, the student needs for success in this course.

Course Outline/Weekly Topics

Week 1	Data acquisition & control, open & closed loops.
Week 2	μ computer history, architecture, memory & port mapping.
Week 3	Interrupts, Bus data acquisition.
Week 4	Analog & digital standards, temperature & light sensors.
Week 5	Pressure transducers, Current loop, RS-232.
Week 6	I/O wiring, software and board initialization, EXAM I.
Week 7	Input handshaking, bit isolation.
Week 8	Output handshaking, bi-directional handshaking.
Week 9	Output signal conditioning, electromechanical relays.
Week 10	Solid-state relays, input signal conditioning, optoisolators.
Week 11	I/O modules, AD conversion, sample & hold circuits, EXAM II.
Week 12	D/A converters.
Week 13	Hardware & software handshaking, serial port software.
Week 14	Line status, interrupt and modem registers.
Week 15	Timers and counters.
Week 16	Multifunction boards, real-time data acquisition analysis, FINAL EXAM.