

I. COURSE DESCRIPTION:

This is a lab course designed to allow the students to develop their problem solving skills by carrying through to completion several Embedded Microcontroller projects. Each project will have hardware and software components. Source code for software will be written in Assembly Language and in C language.

II. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE:

Upon successful completion of this course, the student will demonstrate the ability to:

1. *Writing Assembly Language Programs for a Microcontroller***Potential Elements of the Performance:**

Write source code in assembly language for an embedded microcontroller.

Assemble and debug the program.

2. *Writing C Language Programs for a Microcontroller***Potential Elements of the Performance:**

Write source code in C language for an embedded microcontroller.

Compile and debug the program.

3. *Building Interface Circuitry***Potential Elements of the Performance:**

Design and build hardware interface circuitry for an embedded microcontroller.

4. *Testing Completed Project***Potential Elements of the Performance:**

Test the completed project and debug the problems.

III. TOPICS:

1. Analog to Digital Conversion and display project
2. Key-pad scanning and LED display project
3. Stepper Motor Control Project.
4. Pulse-Width Modulation project

IV. REQUIRED RESOURCES/TEXTS/MATERIALS:

No resources, textbooks or materials required.

V. EVALUATION PROCESS/GRADING SYSTEM:

Evaluation will be based on the following:

- 40% Achieving “milestone” dates for projects
- 10% Engineering Journals (notes).
- 20% Completed lab projects AND reports
- 15% Written tests relating to lab work (source code or hardware)
- 15% Attendance in the lab

If a test is missed for a legitimate reason, it can be rewritten at the end of the course.

The following semester grades will be assigned to students:

Grade	<u>Definition</u>	<i>Grade Point Equivalent</i>
A+	90 – 100%	4.00
A	80 – 89%	3.00
B	70 - 79%	2.00
C	60 - 69%	1.00
D	50 – 59%	0.00
F (Fail)	49% and below	
CR (Credit)	Credit for diploma requirements has been awarded.	
S	Satisfactory achievement in field /clinical placement or non-graded subject area.	
U	Unsatisfactory achievement in field/clinical placement or non-graded subject area.	
X	A temporary grade limited to situations with extenuating circumstances giving a student additional time to complete the requirements for a course.	
NR	Grade not reported to Registrar's office.	
W	Student has withdrawn from the course without academic penalty.	

VI. SPECIAL NOTES:Disability Services:

If you are a student with a disability (e.g. physical limitations, visual impairments, hearing impairments, or learning disabilities), you are encouraged to discuss required accommodations with your professor and/or the Disability Services office. Visit Room E1101 or call Extension 2703 so that support services can be arranged for you.

Retention of Course Outlines:

It is the responsibility of the student to retain all course outlines for possible future use in acquiring advanced standing at other postsecondary institutions.

Communication:

The College considers **WebCT/LMS** as the primary channel of communication for each course. Regularly checking this software platform is critical as it will keep you directly connected with faculty and current course information. Success in this course may be directly related to your willingness to take advantage of the **Learning Management System** communication tool.

Plagiarism:

Students should refer to the definition of “academic dishonesty” in *Student Code of Conduct*. Students who engage in academic dishonesty will receive an automatic failure for that submission and/or such other penalty, up to and including expulsion from the course/program, as may be decided by the professor/dean. In order to protect students from inadvertent plagiarism, to protect the copyright of the material referenced, and to credit the author of the material, it is the policy of the department to employ a documentation format for referencing source material.

Course Outline Amendments:

The professor reserves the right to change the information contained in this course outline depending on the needs of the learner and the availability of resources.

Substitute course information is available in the Registrar's office.

VII. PRIOR LEARNING ASSESSMENT:

Students who wish to apply for advance credit transfer (advanced standing) should obtain an Application for Advance Credit from the program coordinator (or the course coordinator regarding a general education transfer request) or academic assistant. Students will be required to provide an unofficial transcript and course outline related to the course in question.

Credit for prior learning will also be given upon successful completion of a challenge exam or portfolio.