



## COURSE OUTLINE: ELN340 - MICROCONTROLLERS II

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Approved: Corey Meunier, Chair, Technology and Skilled Trades

<b>Course Code: Title</b>	ELN340: EMBEDDED MICROCONTROLLERS II
<b>Program Number: Name</b>	4029: ELECTRICAL TY-PROCES
<b>Department:</b>	ELECT./INSTRUMENTATION PS
<b>Semesters/Terms:</b>	22W
<b>Course Description:</b>	This is an application course which will employ embedded microcontrollers and associated hardware to solve more advanced computer interfacing problems.
<b>Total Credits:</b>	4
<b>Hours/Week:</b>	3
<b>Total Hours:</b>	45
<b>Prerequisites:</b>	CSD105, ELN335
<b>Corequisites:</b>	There are no co-requisites for this course.
<b>Vocational Learning Outcomes (VLO's) addressed in this course:</b>	<b>4029 - ELECTRICAL TY-PROCES</b>
Please refer to program web page for a complete listing of program outcomes where applicable.	VLO 6 Design, assemble, analyze, and troubleshoot electrical and electronic circuits, components, equipment and systems under the supervision of a qualified person.
	VLO 7 Design, install, analyze, assemble and troubleshoot control systems under the supervision of a qualified person.
	VLO 8 Use computer skills and tools to solve a range of electrical related problems.
<b>Essential Employability Skills (EES) addressed in this course:</b>	EES 3 Execute mathematical operations accurately. EES 4 Apply a systematic approach to solve problems. EES 5 Use a variety of thinking skills to anticipate and solve problems. EES 6 Locate, select, organize, and document information using appropriate technology and information systems. EES 7 Analyze, evaluate, and apply relevant information from a variety of sources. EES 9 Interact with others in groups or teams that contribute to effective working relationships and the achievement of goals.
<b>Course Evaluation:</b>	Passing Grade: 50%, D  A minimum program GPA of 2.0 or higher where program specific standards exist is required for graduation.
<b>Other Course Evaluation &amp; Assessment Requirements:</b>	Grade Definition Grade Point Equivalent A+ 90 - 100% 4.00 A 80 - 89% B 70 - 79% 3.00

In response to public health requirements pertaining to the COVID19 pandemic, course delivery and assessment traditionally delivered in-class, may occur remotely either in whole or in part in the 2021-2022 academic year.



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C 60 - 69% 2.00  
 D 50 - 59% 1.00  
 F (Fail) 49% and below 0.00

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.

**Course Outcomes and Learning Objectives:**

<b>Course Outcome 1</b>	<b>Learning Objectives for Course Outcome 1</b>
1. Write high level language programs for a microcontroller.	1.1 Develop algorithms and write source code in a high level language for an embedded microcontroller. 1.2 Compile and debug programs.
<b>Course Outcome 2</b>	<b>Learning Objectives for Course Outcome 2</b>
2. Utilize high level software such as Microsoft Access.	2.1 Develop a system based on Microsoft Access and VBA to collect, store and analyze typical process data.
<b>Course Outcome 3</b>	<b>Learning Objectives for Course Outcome 3</b>
3. Build interface circuitry	3.1 Design, build and commission hardware interface circuitry for an embedded microcontroller.
<b>Course Outcome 4</b>	<b>Learning Objectives for Course Outcome 4</b>
4. Test completed modules and projects.	4.1 Test the completed applications and debug the problems.

**Evaluation Process and Grading System:**

Evaluation Type	Evaluation Weight
Project Execution (function and on time)	35%
Project Specification and Documentation	35%
Tests	30%

**Date:**

September 17, 2021

**Addendum:**

Please refer to the course outline addendum on the Learning Management System for further information.

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