

Administrative Master Syllabus

Course Information

Course Title	Industrial Electronics
Course Prefix, Num. and Title	ELMT 2433 - Industrial Electronics
Division	Technology & Business
Department	Electronics Engineering Technology
Course Type	WECM Course
Course Catalog Description	A study of devices, circuits, and systems primarily used in automated manufacturing and/or process control including computer controls and interfacing between mechanical, electrical, electronic, and computer equipment. Includes presentation of programming schemes. Analog and digital control loops and their application in process control and robotics. Microprocessors for control and monitoring. Sensing devices for pressure, level, flow, temperature, and position. Signal processing: A/D and D/A conversion, feedback, and servos. Laboratory work includes microprocessor and robotics interfacing and control circuits.
Pre-Requisites	Credit for CETT 1405, and CETT 1429, and CETT 1345
Co-Requisites	None

Semester Credit Hours

Total Semester Credit Hours (SCH): Lecture Hours:	4:3:3
Lab/Other Hours	
Equated Pay Hours	4.5
Lab/Other Hours Breakdown: Lab Hours	3
Lab/Other Hours Breakdown: Clinical Hours	0
Lab/Other Hours Breakdown: Practicum Hours	0
Other Hours Breakdown	0

Approval Signatures

Title	Signature	Date
Division Chair:	David Kucera, Technology & Business Division Chair	08-01-2023

Additional Course Information

Topical Outline: Each offering of this course must include the following topics (be sure to include information regarding lab, practicum, and clinical or other non-lecture instruction).

The following performance will be expected of any student completing this course with a passing grade. There is no absolute time limit on the performance of these objectives, unless noted, but the grade received by the student will depend, in part, on the relative speed and precision of the student's performance in these tasks. Where subjective evaluations are indicated, the instructor will make these judgments based on his or her knowledge of the skills required to place a graduate with the expectation of successful on-job performance.

The student will be expected to demonstrate mastery in the following topics in written examination or laboratory demonstration:

- Solid-state devices and circuits
- Programmable controllers
- Thyristors
- Lasers
- Fiber optics
- Power supplies
- Op-amp circuits
- Open- and closed-loop feedback systems
- Input devices
- Output devices
- AC and DC motors
- Motor control devices
- Robots and other motion control systems
- Data communications

Course Learning Outcomes:

Learning Outcomes – Upon successful completion of this course, students will:

1. Describe how electronic input and output circuits are used to control automated manufacturing and/or process systems.
2. Identify basic elements used for input, output, timing, and control
3. Define how programmable electronic systems use input data to alter output responses.
4. Troubleshoot a representative system.
5. Demonstrate how system operation can be altered with software programming.

Methods of Assessment:

Assessment of outcomes 1,2,3,4,5 will be performed through periodic written quizzes, exams, and hands-on laboratory exercises.

Required text(s), optional text(s) and/or materials to be supplied by the student:

A course specific text or industrial documents covering Industrial Electronics. Example: Industrial Electronics by Frenzel
Calculator – scientific with Sine, Cosine, Tangent capabilities

Suggested Course Maximum:

Lecture 20; Lab 20

List any specific or physical requirements beyond a typical classroom required to teach the course.

Lecture facilities for 20 students. An industry related Electronics laboratory facilities for 20 students must include 10 bench positions each with a PC, digital meter, logic probe, digital oscilloscope and probes, bread boarding facility with power supply and signal generator. The lab will contain industrial equipment and a supply of basic circuit components.

Course Requirements/Grading System: Describe any course specific requirements such as research papers or reading assignments and the generalized grading format for the course.

Evaluation of Performance:

Course grades will be determined by the percentage of course objectives for which the student can demonstrate mastery and by attendance. Mastery of course objectives will be determined by written examinations, physical soldering exams, an attendance grade as described in the Departmental Policy handout, a daily work grade which will include graded homework, graded laboratory work, and a comprehensive final exam.

Approximate Grade Evaluation Summary:

Major tests	60%
Attendance	10%
Lab reports, homework, and quizzes	15%
Final examination	15%

Grade Scale:

- 90 to 100: ... A
- 80 to 89: B
- 70 to 79: C
- 60 to 69: D
- 0 to 59: F

Curriculum Checklist:

- Administrative General Education Course** (from ACGM, but not in WCJC Core) – No additional documents needed.
- Administrative WCJC Core Course.** Attach the Core Curriculum Review Forms
 - Critical Thinking
 - Communication
 - Empirical & Quantitative Skills
 - Teamwork
 - Social Responsibility
 - Personal Responsibility
- WECM Course** -If needed, revise the Program SCANS Matrix and Competencies Checklist