



**COWLEY COLLEGE
& Area Vocational Technical School**

COURSE PROCEDURE FOR

**INDUSTRIAL ELECTRONICS
MEC3485 3 Credit Hours**

Student Level:

This course is open to high school and post-secondary level students.

Catalog Description:

MEC 3485 - INDUSTRIAL ELECTRONICS (3 hrs)

The student will demonstrate knowledge of basic industrial electronic principles and devices by solving problems and constructing lab experiments in subjects such as resistive circuits, Ohm's law and power, series and parallel circuits, DC and AC circuits, solid state circuits and devices, and operational amplifiers. Electronics test equipment will be used in the laboratory experiments to explore different electronic circuits and devices.

Prerequisites:

None

Controlling Purpose:

This course is designed to help the student increase their knowledge regarding fundamentals of industrial electronics.

Learner Outcomes:

Upon completion of the course, the student will be able to demonstrate a proficiency in applying modern industrial electronics to manufacturing processes and product flow.

The learning outcomes and competencies detailed in this course outline or syllabus meet or exceed the learning outcomes and competencies specified by the Kansas Core Outcomes Groups project for this course as approved by the Kansas Board of Regents.

Units Outcomes and Criterion Based Evaluation Key for Core Content:

The following defines the minimum core content not including the final examination period. Instructors may add other content as time allows.

Evaluation Key:

A = All major and minor goals have been achieved and the achievement level is considerably above the minimum required for doing more advanced work in the same field.

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DISCLAIMER: THIS INFORMATION IS SUBJECT TO CHANGE. FOR THE OFFICIAL COURSE PROCEDURE CONTACT ACADEMIC AFFAIRS.

- B = All major goals have been achieved, but the student has failed to achieve some of the less important goals. However, the student has progressed to the point where the goals of work at the next level can be easily achieved.
- C = All major goals have been achieved, but many of the minor goals have not been achieved. In this grade range, the minimum level of proficiency represents a person who has achieved the major goals to the minimum amount of preparation necessary for taking more advanced work in the same field, but without any major handicap of inadequacy in his background.
- D = A few of the major goals have been achieved, but the student's achievement is so limited that he is not well prepared to work at a more advanced level in the same field.
- F = Failing, will be computed in GPA and hours attempted.
- N = No instruction or training in this area.

UNIT 1: Semiconductor Fundamentals						
Outcomes: Upon completion of this unit, the student will be able to successfully understand the applications of diodes.						
A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						Explain the operation of a PPN junction with forward and reverse bias.
						Determine how much current is flowing in a circuit.
						Identify special-purpose diodes.
						Explain the process of testing a diode using an ohmmeter.
						List the factors to consider when replacing a diode.

UNIT 2: DC Power Supplies

Outcomes: Upon completion of this unit, the student will be able to successfully understand the sources of DC power.

A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						Draw a block diagram of a typical DC power supply.
						Draw schematic diagrams of half-wave, full-wave center-tapped, voltage doublers, and bridge power supplies.
						State the four possible types of system faults.
						Describe the procedure for efficient troubleshooting.
						Explain the function of the regulator.
						Explain the function of the power supply filter system.

UNIT 3: Transistor Fundamentals

Outcomes: Upon completion of this unit, the student will be able to successfully understand the applications of specialized components.

A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						Explain the relationship between the three currents involved with a bipolar junction transistor.
						Explain the three operating states of a BJT.
						Explain the logic functions AND, OR, NOT, NAND, NOR, and memory.
						Calculate the current gain and voltage gain of an amplifier.
						Explain the difference between open-loop and closed loop control circuits.
						List the general rules for troubleshooting transistors.
						Explain the process for troubleshooting a digital circuit.

Projects Required:

As assigned.

Textbook:

Contact Bookstore for current textbook.

Materials/Equipment Required:

None

Attendance Policy:

Students should adhere to the attendance policy outlined by the instructor in the course syllabus.

Grading Policy:

The grading policy will be outlined by the instructor in the course syllabus.

Maximum class size:

Based on classroom occupancy

Course Timeframe:

The U.S. Department of Education, Higher Learning Commission and the Kansas Board of Regents define credit hour and have specific regulations that the college must follow when developing, teaching and assessing the educational aspects of the college. A credit hour is an amount of work represented in intended learning outcomes and verified by evidence of student achievement that is an institutionally-established equivalency that reasonably approximates not less than one hour of classroom or direct faculty instruction and a minimum of two hours of out-of-class student work for approximately fifteen weeks for one semester hour of credit or an equivalent amount of work over a different amount of time. The number of semester hours of credit allowed for each distance education or blended hybrid courses shall be assigned by the college based on the amount of time needed to achieve the same course outcomes in a purely face-to-face format.

Refer to the following policies:

[402.00 Academic Code of Conduct](#)

[263.00 Student Appeal of Course Grades](#)

[403.00 Student Code of Conduct](#)

Disability Services Program:

Cowley College, in recognition of state and federal laws, will accommodate a student with a documented disability. If a student has a disability, which may impact work in this class which requires accommodations, contact the Disability Services Coordinator.