



**COWLEY COLLEGE
& Area Vocational Technical School**

COURSE PROCEDURE FOR

**ELECTROMECHANICAL TECHNOLOGY
MLL3601 3 Credit Hours**

Student Level:

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

Catalog Description:

MLL3601 – ELECTROMECHANICAL TECHNOLOGY (3)

At the completion of the course, the student will be able to demonstrate maintenance and troubleshooting procedures on various types of electrical motors and electromechanical systems.

Prerequisites:

None

Controlling Purpose:

This course is designed to help the student increase their knowledge regarding fundamentals of electromechanical devices with strong emphasis on motors.

Learner Outcomes:

Upon completion of the course, the student will be able to demonstrate a proficiency in basic electromechanical devices with strong emphasis on motors.

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.
- 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

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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: 60 Hertz and Three-Phase Power						
Outcomes: Upon completion of this course students will be able to successfully understand AC power.						
A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						Identify the main parts of a generator.
						Describe the generation of three-phase power.
						Describe the distribution of residential power.
						Design and interpret ladder diagrams.
						Diagram various three-phase transformers and a four-wire system.
						Describe typical manufacturing distribution systems.
						Outline the advantages of three-phase power.

UNIT 2: Electric Motors

Outcomes: Upon completion of this course students will be able to successfully understand basic electric motor designs.

A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						Identify the parts of an electric motor.
						Explain the basic operation of a DC motor.
						Explain the basic operation of a squirrel-cage motor.
						Explain the operation of a shaded-pole motor.
						Identify the problems associated with motors.
						Develop a motor maintenance schedule.
						Design and interpret a block diagram of a typical DC power supply.

UNIT 3: Motor Controls

Outcomes: Upon completion of this course students will be able to successfully apply gate logic to motor control.

A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						Explain the logic functions AND, OR, NOT, NAND, NOR, and memory.
						Outline the types of motor controllers.
						Explain the difference between open-loop and closed-loop control circuits.
						List the general rules for troubleshooting motor circuits.
						Explain the process for troubleshooting a motor circuit.

UNIT 4: AC Alternators

Outcomes: Upon completion of this course students will be able to successfully understand operating principles of AC power generation.

A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						Describe the construction of an alternator.
						Describe the differences between a revolving-field alternator and a revolving-rotor alternator.
						Describe how the output voltage and frequency are controlled in an alternator.
						List and explain the steps in producing AC power from an alternator.
						Explain how to parallel two or more alternators and list the parameters that need to be matched.

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.