

**ELEI 207**  
**A.C. MOTOR THEORY AND CONTROLS**  
**3 Semester Hours**

**The Community College of Baltimore County**

**Description**

**A.C. Motor Theory and Controls**

Studies the theory, operation, and control of the most commonly used A.C. motors and alternators; emphasizes the installation, maintenance, and troubleshooting of the motors and motor controls.

Pre-requisites: ELEI 107 or consent of the instructor.

**Overall Course Objectives.**

Upon completion of this course the student will be able to:

Demonstrate in written and oral presentation a basic understanding of the various types of single-phase and three-phase motors. Demonstrate in written and oral presentation an understanding of A.C. motor controllers.

Demonstrate in written and oral presentation an understanding of troubleshooting, repair, and maintenance of motors, controllers, and their associated protective devices. Demonstrate through a laboratory setting a working knowledge of A.C. motors, controls, and protective devices as it is actually applied to industrial situations.

**Major Topics**

Single phase A.C. motor types: split phase induction, shaded pole, capacitor start, capacitor start and capacitor run, synchronous motor, repulsion motor, universal motor. Three-phase motor types: squirrel-cage induction type, wound rotor induction motor, synchronous three-phase motor. Motor connections and characteristics delta connected, wye connected, motor torque, motor speed, motor C.E.M.F. slip, synchronous speed. Motor control circuits single-phase motor single speed control, single-phase motor multiple speed control, reversing single-phase motors. Three-phase motor control across the line starting, reduced voltage starting, reversing controllers, multi speed controller. V.F.D. (variable-frequency-drives) principles of variable frequency motor operation, variable frequency motors, variable frequency controllers, programming variable frequency drives, key pad operation, entering parameters, recalling data, start-run-stop operations. Troubleshooting, repair, and maintenance of motors and motor control circuits. Protective devices fuses, time delays, circuit breakers, special protective devices.

**Course Requirements**

The instructor will administer Tests (60%), Lab work (30%), Written assignments (10%).

**Other Course Information**

**Additional information about this course or any other Industrial electricity/electronics course can be obtained by contacting the IEE/Telecommunications program director.**