Print Date: 7/29/14

Course Objectives/Course Outline
Spokane Community College

Course Title: **AC Motors and Alternators**
Prefix and Course Number: **ELMT 133**

Course Learning Outcomes:
By the end of this course, a student should be able to:

- describe the difference between single- and three- phase alternators
- connector alternators in wye and delta configurations
- properly parallel alternators
- calculate load characteristics and power factors under various load conditions
- perform load tests on AC motors and compute speed regulation

*Two, three, and four credit class content will be determined from input provided by faculty from individual programs which have specific electrical requirements.

Course Outline:

I. Alternators
  A. Theory of Operation
    1. revolving armature
    2. revolving field
    3. single-phase
    4. poly-phase
  B. Characteristics
    1. unity power factor load
    2. lagging power factor load
    3. leading power factor load
  C. Paralleling Alternators
    1. frequency
      a) speed of prime mover
    2. phase voltage
      a) excitation current
    3. phase sequence
      a) three lamp method
    4. in-phase
      a) all dark method
      b) two bright-one dark method
      c) oscilloscope
      d) synchroscope
  D. Applied Problems
    1. Saturation Curves of an Alternator
    2. Effect of Speed on an Alternator
    3. Wye and Delta Connections
    4. Load Characteristics of an Alternator
    5. Losses and Efficiency of an Alternator
    6. Paralleling Alternators

II. Single-Phase AC Motors
    A. Theory, Operation, and Types of Motors
        1. split-phase
            a) induction start-induction run
            b) capacitor start-induction run
            c) permanent capacitor
            d) two-capacitor
    B. Applied Problems of Single-Phase Motors
        1. rotation
        2. starting and running characteristics
        3. assembly and disassembly of split-phase motors
III. Three-Phase AC Motors
    A. Theory and Operation
        1. squirrel
        2. wound rotor motors
        3. synchronous motors
    B. Applied Problems of Three-Phase Motors
        1. rotation
        2. starting and running characteristics
        3. losses and efficiency of induction motors
        4. starting and synchronizing of synchronous motors
        5. power factor correction with synchronous motors