Alexandria Technical and Community College

MGEM 2630: Marine Electrical Systems

A. COURSE DESCRIPTION

Credits: 4  
Lecture Hours/Week: 3  
Lab Hours/Week: 2  
OJT Hours/Week: *.*

Prerequisites:  
This course requires the following prerequisite  
  MGEM 1703 - Internship (Number of Years Valid: 5)

Corequisites: None  
MnTC Goals: None

This course studies electrical theory and ignition system troubleshooting. Topics include electrical theory of operation, electrical symbols, components used, testing devices, and troubleshooting. Practical use of electronic symbols and theory, hands-on testing, and factory methods/manuals to solve service problems are used. Several different models of outboard motors and stern drive engines are used for hands-on experience. Learners work on starters and charging systems used in the marine field. Factory manuals, test procedures, and troubleshooting are covered.

B. COURSE EFFECTIVE DATES: 03/06/2020 - Present

C. OUTLINE OF MAJOR CONTENT AREAS

1. Define modern marine propulsion system designs.  
2. Review basic electrical theory.  
3. Demonstrate the safe use of electrical test equipment.  
4. Perform diagnostic test procedures on battery charging systems.  
5. Identify and diagnose cranking systems.  
6. Identify and diagnose key switch wiring hardness.  
7. Assemble and test battery switches and isolators.  
8. Remove, install and adjust distributor ignition systems.  
9. Verify ignition timing curves and perform adjustments.  
10. Identify and diagnose modern capacitor discharge ignition systems.  
11. Identify and test relays & solenoids.  
12. Identify trim and tilt systems.

D. LEARNING OUTCOMES (General)

1. The learner will explain electrical theory and how it relates to modern marine product.  
2. The learner will identify and troubleshoot charging and cranking systems.  
3. The learner will identify and troubleshoot ignition systems.  
4. The learner will demonstrate electrical troubleshooting procedures.

E. Minnesota Transfer Curriculum Goal Area(s) and Competencies

None
F. LEARNER OUTCOMES ASSESSMENT
   As noted on course syllabus

G. SPECIAL INFORMATION
   None noted