MASTER COURSE OUTLINE

Prepared By: Bill Autry

Date: April 2014

COURSE TITLE

Industrial Electricity I

GENERAL COURSE INFORMATION

Dept.: IST	Course Num: 107	(Formerly:)
CIP Code: 47.0302	Intent Code: 21	Program Code: 784
Credits: 5		
Total Contact Hrs Per Qtr.: 77		
Lecture Hrs: 33	Lab Hrs:44	Other Hrs:
Distribution Designation:		

COURSE DESCRIPTION (as it will appear in the catalog)

This course explores electrical theory and application as it applies to modern power generation and transmission. Three phase systems and their related equipment, power panels, control devices, motors, as related to the industrial environment are covered etc. Use of test equipment, electrical print reading and troubleshooting skillsets will be covered.

PREREQUISITES

IST 106 or Instructor Permission

TEXTBOOK GUIDELINES

Appropriate textbook as determined by faculty (Example: *Electrical Motor Controls*, by Gary Rockis & Glen Mazur).

COURSE LEARNING OUTCOMES

Upon successful completion of the course, students should be able to demonstrate the following knowledge or skills.

1. Read industrial electrical schematics and demonstrate troubleshooting techniques
2. Safely demonstrate the use of test equipment to test and repair electrical apparatus and systems
3. Understand elementary control systems and explain electrical theory
4. Explain 3-phase power and its applications
5. Explain operating principals of various types of electrical motors
6. Demonstrate basic knowledge of NEMA wire codes

INSTITUTIONAL OUTCOMES

COURSE CONTENT OUTLINE

1) Introduction and review of Basic Electricity
2) Three-phase power
   a) Concepts of 3-phase
   b) Power generation
   c) Transformer systems - Delta and Wye configurations and ratings (KVA)
3) Electric motors

a) types (single and three phase)
b) Motor windings and principals
c) Start and run windings

4) Electric motor cont.
   a) Induction motors
   b) Motor speeds
   c) Horsepower and characteristics
   d) Motor protection
   e) Motor application
5) Motor controls
   a) Magnetic starters and contactors
   b) Overload controls
   c) trouble-shooting
6) Basic controls
   a) Electrical schematics and application
   b) Testing and analyzing procedures
7) Controls applied to motor panels
   a) Application of wiring schematics
   b) Troubleshooting
   c) Safe testing and analyzing procedures
8) Control wiring
   a) Creation of simple control wiring and 3-phase motor wiring diagrams
   b) Practical Wiring - hand switches, relays, solenoids, magnetic starters, etc.
9) NEMA and wiring code - (basic)
   a) Choosing electrical apparatus
   b) Sizing conductors
   c) Wiring practices

DEPARTMENTAL GUIDELINES *(optional)*

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DIVISION CHAIR APPROVAL **DATE**