

Minnesota State College Southeast

INDS 1662: Electro-Thermal Systems Control

A. COURSE DESCRIPTION

Credits: 4

Lecture Hours/Week: 2

Lab Hours/Week: 4

OJT Hours/Week: *.*

Prerequisites:

This course requires the following prerequisite
INDS 1660 - Mechanical Power Transmission

Corequisites: None

MnTC Goals: None

This course applies basic physics to engineering evaluations of mechanical products, structures and procedures. Students will study and evaluate mechanical drive systems including service, repair, and troubleshooting principles as they pertain to HVAC systems. Thermodynamic principles are studied in heating and cooling systems. The student will be introduced to industrial programmable controllers and electro-thermal systems. (Prerequisites: INDS1660) (4 credits: 2 lecture/2 lab)

B. COURSE EFFECTIVE DATES: 02/01/2019 - Present

C. OUTLINE OF MAJOR CONTENT AREAS

D. LEARNING OUTCOMES (General)

1. Examine basic physics as applied to mechanical systems
2. Explain bearing maintenance and lubrication concepts
3. Evaluate mechanical drive system failures
4. Explain safety concepts involved in industrial maintenance
5. Evaluate various equipment maintenance principles
6. Evaluate service and repair principles
7. Explain electrical system maintenance requirements
8. Examine industrial programmable controller maintenance requirements
9. Describe programmable controller system operation
10. Analyze principles of physics as applied to HVAC systems
11. Explain the vapor cycle cooling principle
12. Describe maintenance requirements for vapor cycle cooling systems
13. Examine and test operation of cooling and heating systems
14. Perform failure analysis of cooling and heating systems
15. Explain boiler heating concepts
16. Describe maintenance requirements for boiler heating systems
17. Examine and test operation of boiler heating systems
18. Perform failure analysis of boiler heating systems
19. List air conditioning factors
20. Examine methods of controlling various air conditioning factors
21. Examine nanotechnology as applied to industrial operations
22. Evaluate equipment service and repair principles

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

None

F. LEARNER OUTCOMES ASSESSMENT

As noted on course syllabus

G. SPECIAL INFORMATION

None noted