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
   IND S 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: IND S 1660) (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