Course Description: Methods for troubleshooting electrical control devices and control circuits including correctly wiring electrical components. This course covers the proper methods for troubleshooting electrical control devices and control circuits. The student will study the correct wiring for components such as lock out relays, oil failure controls, and thermostats. The student will be introduced to solid state controls and their functions. **Prerequisites: HART 1401 or consent of instructor.**

2. Industry Literature

Course Goals/Objectives: This course is designed to help apply knowledge gained in the HART 1401 class to more complicated and detailed circuits. This course also gives an introduction to the solid state controls being used more often in the AHRT industry. The following list of course goals will be addressed in the course. These goals are directly related to the performance objectives. Upon successful completion of the course the student will:

(* designates a CRUCIAL Goal)

1. Display work habits.
2. Draw a dual transformer wiring diagram.
3. Identify thermostat terminal designations.
4. Describe cooling anticipator purpose.
5. Describe heating anticipator purpose.
6. Connect 3 wire oil failure control circuit
7. Connect 4 wire oil failure control circuit.
8. Connect combination lock-out relay/oil failure circuit.
10. Connect lock-out relay circuit.
11. Connect time guard circuit.
12. State purpose lock-out relays.
13. Trace schematic diagrams.
15. Define cathode.
17. Define rectifier.
18. Define thermistor.
19. Define conventional current flow.
20. Define electron flow.
22. Describe benefit of solid state over conventional Devices.
23. Explain solid state control disadvantages.
24. Explain solid state control advantages.
25. Explain rectification.
26. Explain diode operation.
27. Explain silicon controlled rectifier.
28. Explain triac operation.
29. Identify diode symbol.
30. Identify schematic components.
31. Identify SCR symbol.
32. Identify transistor symbol.
33. Calculate full wave bridge rectifier output voltage.
34. Trace full wave bridge rectifier circuit.

Student Contributions and Class Policies:
Each student will spend at least 4 hours per week preparing for class. As a student in this course you are expected to display respect, professional behavior, and cooperative attitude at all times. Punctual attendance is critical in this class due to the extent of the material. The college attendance policy will be strictly adhered to. The student is expected to be prepared to work and to participate in all class activities.

Evaluation of Students

<table>
<thead>
<tr>
<th>Component</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lab</td>
<td>30%</td>
</tr>
<tr>
<td>Quizzes and Homework</td>
<td>25%</td>
</tr>
<tr>
<td>Attitude and Attendance</td>
<td>20%</td>
</tr>
<tr>
<td>Final Exam</td>
<td>25%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
</tr>
</tbody>
</table>

Course Schedule:
The class meets for 6 lecture hours and 6 lab hours per week for 8 weeks.
AMERICANS WITH DISABILITIES ACT (ADA):

Any student who, because of a disabling condition, may require some special arrangements in order to meet course requirements should contact Shep Grinnan as soon as possible. Mr. Grinnan’s office is located in the Scharbauer Student Center Building. These conditions may include documented physical or educational disabilities. Please be aware that services or accommodations are not automatic. Each student must request them and secure the proper authorizations/documentation.

SCANS Information:
The following SCANS skills will be taught and/or reinforced in this course.

TECHNOLOGY:
Chooses procedures, tools or equipment including computers and related technologies. Prevents, identifies, or solves problems with equipment.

ARITHMETIC/MATHEMATICS:
Performs basic computations; uses tables, graphs, diagrams and charts to obtain or convey quantitative information. Expresses mathematical ideas and concepts orally and in writing.

Instructor Information: Jaroy Roberts, Professor
Room 187 TC
(432) 685-4687 Office
(432) 349-5913 cell
E-Mail: jroberts@midland.edu

Office Hours: Posted

Curt Pervier, Applied Technology Dean
Lisa Tanner, Applied Technology Secretary
Room 143A TC
(432) 685-4676
Fax: (432)685-6472

Students are encouraged to contact the instructor at any time; however, making an appointment will guarantee the instructor’s availability at a specific time.