Faculty is required to have the outline submitted to the Academic Affairs Office. The course outline is the form used for approval of new courses by the Academic Affairs and Standards Council.

DEPT. Plumbing & Heating Technology                  COURSE NUMBER: PLHT 1120

NUMBER OF CREDITS: 3 (1 lecture; 2 lab)

COURSE TITLE: Heating and Air Conditioning Electrical and Control Circuits

CATALOG DESCRIPTION: Understand the fundamentals of electricity, electrical controls and circuits, safety and operative controls in residential heating and air conditioning. Students will learn how they operate, what they control, and what the controls are protecting and how they are protecting the unit, device or structure.

AUDIENCE: Students interested in pursuing a career in plumbing and heating.

FULFILLS MN TRANSFER CURRICULUM AREA(S)  (Leave blank if not applicable)
Area: by meeting the following competencies:
Area: by meeting the following competencies:
Area: by meeting the following competencies:

PREREQUISITES OR NECESSARY ENTRY SKILLS/KNOWLEDGE:

LENGTH OF COURSE: Semester

THIS COURSE IS USUALLY OFFERED:
Every other year [ ] X fall [ ] spring [ ] summer [ ] undetermined [ ]

Four goals are emphasized in course at Minnesota West Community & Technical College:

1) ACADEMIC CONTENT: The academic objectives of this course are:
   a. Recognize safe methods of working with electricity and electrical circuits.
   b. Understand fundamentals of electricity, electrical circuits and controls, electrical drawings and schematics
   c. Identify application of electrical controls for heating and cooling systems.
   d. Troubleshooting and diagnostics.

2) THINKING SKILLS: This course will help students improve the effectiveness of their thinking skills through:
   a. Completing homework (reading, reports, and worksheets)
   b. Participating in classroom discussions
   c. Taking open and closed book quizzes and tests
   d. Complete assigned lab projects
3) COMMUNICATIONS SKILLS: This course will help students improve their oral and written communication skills through:
   a. Participate in classroom discussions and reports.
   b. Participate in assignments, worksheets and reports

4) HUMAN DIVERSITY: This course will help students recognize, understand, and appreciate human diversity through:
   a. Participate in classroom discussions.
   b. Work with fellow students on projects.
   c. Working with students from other cultures.

TOPICS TO BE COVERED:
1. Fundamentals of electricity, electrical controls and circuits, electrical symbols.
2. Application of fundamentals of electricity, electrical controls and circuits to heating and cooling systems.
3. Use of testing and measuring tools.
4. Troubleshooting and diagnostics.
5. Safe and proper methods of working with electricity and electrical circuits.

COURSE LEARNING OUTCOMES (GENERAL):
   a. Understand fundamentals of electricity, electrical controls and circuits.
   b. Apply electrical fundamentals, controls, circuits, and components to heating and cooling systems.
   c. Identify proper wiring and circuit properties.
   d. Safe handling and working with electricity and electrical components.
   e. Troubleshooting and diagnostics.

STUDENT LEARNING OUTCOMES (SPECIFIC):
Students will:
1. Interpret electrical symbols
2. Identify electrical construction materials
3. Calculate wire sizes
4. Calculate simple circuit properties
5. Troubleshoot simple electrical circuit
6. Troubleshoot electrical components
7. Repair individual electrical components
8. Create complex wiring circuits
9. Calculate complex circuit electrical properties
10. Measure complex circuit electrical properties
11. Troubleshoot complex electrical circuit
12. Assemble a three way switching circuit
13. Assemble a fan/blower electrical circuit
14. Troubleshoot fan/blower electrical circuit

LEARNING/TEACHING TECHNIQUES used in the course are:
   x Collaborative Learning             x Problem Solving
ASSIGNMENTS AND ASSESSMENTS FOR THIS CLASS INCLUDE:

- Student Presentations
- Interactive Lectures
- Creative Projects
- Individual Coaching
- Lecture
- Films/Videos/Slides
- Demonstrations
- Other (describe below)
- Lab
- Oral Presentations
- Tests
- Individual Projects
- Textbook Problems
- Worksheets
- Collaborative Projects
- Group Problems
- Papers
- Portfolio
- Other (describe below)
- Term Paper

Veteran Services: Minnesota West is dedicated to assisting veterans and eligible family members in achieving their educational goals efficiently. Active duty and reserve/guard military members should advise their instructor of all regularly scheduled military appointments and duties that conflict with scheduled course requirements. Instructors will make every effort to work with the student to identify adjusted timelines. If you are a veteran, please contact the Minnesota West Veterans Service Office.

The information in this course outline is subject to revision

To receive reasonable accommodations for a documented disability, please contact the campus Student Services Advisor or campus Disability Coordinator as arrangements must be made in advance. In addition, students are encouraged to notify their instructor.

This document is available in alternative formats to individuals with disabilities by contacting the Student Services Advisor or by calling 800-658-2330 or via your preferred Telecommunications Relay Service.

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