Polaris Career Center Course Syllabus

Heating, Ventilating, Air Conditioning & Refrigeration (HVAC/R)
Adult

Course Information

Instructor:	Dennis Haessly	Phone:	440.891.7663
		Fax:	440.243.3952
		Email:	dhaessly@polaris.edu
		Room:	105
		Meeting Time:	*Day Class* – August – January or February - June Monday through Thursday 8:00 AM to 4:30 PM *Evening Class* – September – May Monday through Thursday 5:00 PM – 10:00 PM
		Availability:	3:30 PM to 4:30 PM

Course Description

The HVAC/R program at Polaris Career Center will help students access this growing field. The program takes place in a comprehensive classroom and practical learning environment on real equipment. As the population and economy grow, so does the demand for new residential, commercial, and industrial climate control systems. According to the Ohio Department of Jobs and Family Services, employment opportunities in the heating and cooling industry will increase by almost 27 percent by 2014. According to the Air Conditioning, Plumbing and Heating Career Education Coalition, a highly trained technician's salary can range from $35,000 to $100,000 a year. The course includes, but is not limited to: introduction to construction & maintenance, piping practices, cutting and threading black pipe, refrigeration system safety, operation and heating service, ventilation, air conditioning safety, schematic reading, safe venting, refrigerant system recovery/dehydration/recharging, duct work, electrical controls, preventive maintenance practices, diagnostic & troubleshooting techniques, soldering and brazing, customer service skills, and employment skills. The program provides 600 hours of instruction and hands on lab work. New classes start in September and January. All students are given the opportunity to earn the EPA Section 608 Certification, ICE Competencies (Industry Competency Exam) and National Center for Construction Education & Research (NCCER) Certification in Core Curriculum. The prerequisite is either a high school diploma or a GED. Students must be self-directed with a solid work ethic. Students will be allowed to use Polaris Career Center tools for the duration of the course.

Major Course Goals

The major goals of the Adult Heating, Ventilating, Air Conditioning & Refrigeration (HVAC/R) program/course will ask students to:

1. Understand and properly use the tools necessary to the HVAC/R industry.
2. Gain the ability to troubleshoot and service HVAC/R equipment.
3. Gain EPA Section 608 certification.
4. Gain the knowledge necessary to secure a entry level position in the HVAC/R field.

Instructional Philosophy

Class starts at 8:00 a m. and ends at 4:30 p.m. on the following days: Monday, Tuesday, Wednesday, and Thursday. On most days lectures are given in the morning and hands on lab assignments take place after lunch. Students will work both independently and in work groups. There will be some homework assignments given.

Course Units of Study

The major course units of study include:

- General Safety Practices
- Refrigeration Theory
- Matter and Energy
- Refrigeration and Refrigerants
- Hand tools and Test Equipment
- Tubing and Piping
- Refrigerant and Oil Chemistry and Management
- System Evacuation
- System Charging
- Basic Electricity and Magnetism
- Introduction to Automatic Controls
- Automatic Control Components and Applications
- Types of Electric Motors
- Application of Motors
- Motor Controls
- Troubleshooting Electric Motors
- Evaporators and Condensers
- Compressors
- Expansion Devices
- Electric Heat and Gas Heat
- Hydronic Heat
- Indoor Air Quality
- Refrigeration Applied to Air Conditioning
- Air Distribution and Balance
- Installation
- Typical Operation Conditions and Troubleshoting
- Air Source Heat Pumps
- Domestic Refrigerators
- Esco Institute EPA Section 608 PreparationTraining
- National Center for Construction Education and Research
    - Basic Safety
    - Introduction to Construction Math
    - Introduction to Hand Tools
    - Introduction to Power Tools
    - Introduction to Blueprints
    - Basic Rigging
    - Basic Communication Skills
    - Basic Employability Skills

Primary Curriculum Materials

Textbook - Refrigeration & Air Conditioning Technology ISBN-978-1428319363
Workbook - Lab Manual for Refrigeration and Air Conditioning Technology ISBN-978-1428319370

Business and Industry Credentials, Certifications, and/or Licenses

Students may earn the following industry certifications:
EPA Section 608 Universal Certification
Industry Competency Exam Certificate
National Center for Construction Education and Research (Core Curriculum Certification)

Course Projects and Special Activities

Most chapters will have hands-on activities that will direct the students to master an industry required procedure. Near the end of the class, the students will be asked to construct a refrigeration system with specific components directed by the instructor. During electrical instruction, the students will build a electric board used to learn electrical components of most HVAC/R systems.

Course Policies
Code of Conduct:
The published Code of Conduct for Polaris Career Center found in the Adult Student Handbook will be enforced at all times. Students should refer to the Handbook for discussions of due process and safety violations.

Dress and Grooming Guidelines:
The District's adult dress code is established to reflect the educational environment that must be maintained by all students. All students working in the lab must wear non-tinted safety glasses. Adult students should refer to their handbook for explicit explanations.

ID:
As stated in the Handbook, students will wear their Polaris IDs at all times.

Attendance/Tardiness:
Students must maintain 90% attendance and tardy hours will be deducted from student total hours.

Make-up Work:
All work must be completed in the class room. Exceptions will be allowed by the instructor.

Computer Usage:
Internet will not be available and computers will not be needed to complete this class.

Infinite Campus:
Not applicable.

Syllabus Changes:
The instructor/Polaris Career Center Administration reserves the right to make changes to this syllabus throughout the year.

Course Assessment Plan

Grades will be determined and reported in the following areas:

- Theory of Heat
- Safety, Tools and Equipment
- Shop Practices/Lab Work
- Basic Automatic Controls/Lab Work
- 2nd Semester - Unit/Lab Test
- Mid-Term Exam
- Air Conditioning (Heating)/Lab Work
- Air Conditioning (Cooling)/Lab Work
- Professional Development
- Final Exam

Grades for the course will be based on the following levels of performance:

Grade	Description
A (90-100%)	Work is correct with only minor flaws (not having to do with the main idea of the problem). The concepts presented in class were understood and were appropriately applied to real-world examples. All assignments were completed with a work quality.
B (80-89%)	Work was done with a few flaws. The concepts presented in class were applied with help. Almost all tasks and assignments were completed with sufficient skills
C (70-79%)	Some difficulty was had understanding class concepts or applying concepts to real-world situations.
D (60-69%)	Only some of the work was completed for class. Work completed was of low quality with errors and omissions.
F (0-59%)	Did not complete a significant amount of work for the class. Work had major errors and did not meet standards.