

**PROVIDENCE CAREER & TECHNICAL ACADEMY**  
**HVAC/PLUMBING**  
Syllabus

**Instructor Name: Robert Sherwood and Kevin Masse**

**Time Frame: 2018-2019 Year**

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**Course Description**

This course involves an orientation of the requirements and other information needed for job entry in the plumbing and HVAC field.

This course will familiarize the students with the terminology and principles of basic plumbing, heating, ventilation and air conditioning used in the profession. A variety of topics will be present such as safety, drawings, fittings, fixtures, and fixtures.

This course will follow the **NCCER** curriculum for the following:

<b>Curriculum</b>	<b>Grades Participating</b>
<b>CORE CURRICULUM</b>	<b>Freshmen/ Sophomores</b>
<b>PLUMBING LEVEL ONE</b>	<b>Sophomores/ Juniors</b>
<b>PLUMBING LEVEL TWO</b>	<b>Juniors/ Seniors</b>
<b>HEATING, VENTILATION, AIR CONDITIONING LEVEL ONE</b>	<b>Sophomores/ Juniors/ Seniors</b>
<b>HEATING, VENTILATION, AIR CONDITIONING LEVEL TWO</b>	<b>Seniors</b>
<b>HVAC SHEET METAL LEVEL ONE</b>	<b>All Grades</b>

**Textbooks**

NCCER Core Curriculum fifth edition

ISBN-13: 978-0-13-424400-6

NCCER Plumbing Level One Training Guide Prentice-Hall fourth edition

ISBN-13: 978-0-13-292143-5

NCCER Plumbing Level Two Training Guide Prentice-Hall fourth edition

ISBN-13: 978-0-13-314850-3

NCCER Heating, Ventilation, Air Conditioning Level One fourth Edition

ISBN-13: 978-0-13-418619-1

NCCER Heating, Ventilation, Air Conditioning Level Two fourth Edition

ISBN-13: 978-0-13-340427-2

NCCER Sheet Metal Level One Training Guide Prentice-Hall third edition

ISBN-13: 978-0-13-604482-6

## **Standards Addressed and Student Learning Outcomes**

Effective communication  
Learn effectively  
Demonstrate cooperative teamwork skills  
Demonstrate and apply safety in the workplace  
Learn and utilize critical and creative thinking  
Demonstrate responsible work ethics  
Demonstrate safe practices using hand and power tools

## **Instructional Methods**

Lecture and discussion will be used in the presentation of concepts, information and assignment requirements  
Demonstrations of procedures and techniques  
Lab time will be provided for skill development using tools and equipment  
Audio visuals may be used to supplement instructions

## **Core Curriculum**

**M1**-Basic safety  
**M2**-Introduction to construction math  
**M3**-Introduction to hand tools  
**M4**-Introduction to power tools  
**M5**-Introduction to construction drawings  
**M6**-Introduction to rigging (Optional)  
**M7**-Basic communication skills  
**M8**-Basic employability skills  
**M9**-Introduction to material handling

## **Plumbing Level One**

**M1**-Introduction and history of the plumbing industry  
**M2**-Plumbing safety  
**M3**-Tools of the plumbing trade  
**M4**-Introduction to plumbing math  
**M5**-Introduction to plumbing drawings  
**M6**-Plastic pipe and fittings  
**M7**-Copper tube and fittings

- M8-Cast-iron pipe and fittings
- M9-Carbon steel pipe and fittings
- M10-Introduction to plumbing fixtures
- M11-Introduction to drain waste and vent systems
- M12-Introduction to water distribution systems

## **Plumbing Level Two**

- M1-Plumbing math two
- M2-Reading Commercial Drawings
- M3-Structural penetrations, and fire stopping
- M4-Installing and testing DWV Piping
- M5-Installing roof, floor, and area drains
- M6-Installing and testing water supply piping
- M7-Types of valves
- M8-Installing fixtures and valves
- M9-Installing water heaters
- M10-Basic electricity
- M11-Fuel gas and fuel oil systems

## **Heating, Ventilation, Air Conditioning Level One**

- M1-Introduction to HVAC
- M2-Trade mathematics
- M3-Basic electricity
- M4-Introduction to heating
- M5-Introduction to cooling
- M6-Introduction to air distribution systems
- M7-Basic copper and plastic piping practices
- M8-Soldering and brazing
- M9-Basic carbon steel piping practices

## **Heating, Ventilation, Air Conditioning Level Two**

- M1-Alternating Current
- M2-Compressors
- M3-Refrigerants and oils
- M4-Leak detection, evacuation, recovery, and charging
- M5-Metering devices
- M6-Heat Pumps
- M7-Basic maintenance
- M8-Chimneys, vents, and flues
- M9-Sheet metal duct systems
- M10-Fiberglass and flexible duct systems
- M11- Commercial airside systems
- M12- Air quality equipment

**M13-Introduction to hydronic systems**

### **Sheet Metal Level One**

**M1-Introduction to the sheet-metal trade**

**M2-Tools of the trade**

**M3-Introduction to the sheet-metal layout process**

**M4-Trade math**

**M5-Parallel line development**

**M6-Installation of the work**

**M7-Air distribution accessories**

**M8-Insulation**

**M9-Architectural sheet metal**

### **Guidelines for Success and Grading Policy**

Assessment is an integral part of the educational process. Feedback is an important tool in continuously improving the education the students. Concepts will be evaluated through the use of workbooks, periodic tests, tool identification and practical applications. The grading rationale and grading scale is as follows:

40%-- participation-attendance, safety, work attire, textbook, tools, behavior, cleanup

20%-- daily quizzes and assignments

20%-- performance assessments, exams

10%-- NCCER accrediting exams

### **Academic Integrity:**

Students are expected to submit their own original work. He or she will be expected to finish their modules and associated hands on lab in a timely manner. PCTA expects every student to demonstrate ethical behavior with regards to academic pursuits. Academic integrity in the classroom is a specific requirement. Definitions, examples, and possible consequences for violations of academic integrity can be found in the PCTA student handbook. Classroom attendance is required. Material missed must be made up with the instructor.

### **PCTA HVAC\Plumbing**

1. The HVAC\Plumbing department shall identify on a monthly basis any student who has frequent absences, several missed assignments, and lack of productivity within the classroom.
2. Upon identifying a student with needs a meeting shall be made with the student, guidance, and the teacher of record to evaluate the student's lack of performance when attending HVAC\Plumbing. This meeting will allow the student and instructor to produce a comprehensive plan with the help of a guidance counselor to get the student to the appropriate performance level. This gives the student the opportunity to be a part of his or her education and redirection of their education.
3. If the student does not comply with the agreement within 2 weeks, a representative from the HVAC\Plumbing department will contact the guidance department to make an appointment for a second conference including the parent to discuss any issues or concerns about their child.
4. If student performance continues to decline the student will be referred to RTII (see below for RTI plan)

#### PCTA HVAC\Plumbing RTII Plan

1. The HVAC\Plumbing will meet once a month to discuss any potential students who are in the "at risk" category. The "at risk" category is defined as any student missing more than 10 days in one quarter, also any student who fails an assessment from the curriculum.
2. Once any "at risk" students have been identified an EWS form shall be forwarded to guidance and special education. The form will be filed permanently in the HVAC\Plumbing department.
3. The student will be enrolled in weekly after-school tutoring to help provide the student additional support.
4. Check-ins with the students' progress and the teacher of record will be monitored.
5. A meeting shall be scheduled with the RTII team to discuss further actions to create a comprehensive plan for the students to succeed.