

COURSE SYLLABUS

LAST REVIEW	Fall 2022
COURSE TITLE	HVAC Heating and Maintenance
COURSE NUMBER	BEMT 0202
DIVISION	Career and Technical Education
DEPARTMENT	BEMT
CIP CODE	46.0401
CREDIT HOURS	2
CONTACT HOURS/WEEK	Class: .5 Lab: 3
PREREQUISITES	None

COURSE DESCRIPTION

This is a basic course which requires the student to be heavily involved in all instructional methods. This course requires the student to disconnect and install a new unit, remove all refrigerant and liquids, completely dismantle an existing unit, determine proper amperage and ohm readings, test for existing amperage and ohm readings, install proper electrical disconnect and wiring, size the wire and electrical fixtures properly, and have the ability to apply basic fundamental code requirements.

PROGRAM LEARNING OUTCOMES

Students will demonstrate an adherence to safety standards and proficiency in the installation or repair of residential electrical, plumbing, HVAC, exterior building materials, roofing, irrigation systems, landscape/hardscape, concrete placement and finish, masonry install and repair.

TEXTBOOKS

<http://kckccbookstore.com/>

METHODS OF INSTRUCTION

A variety of instructional methods may be used depending on content area. These include but are not limited to: lecture, multimedia, cooperative/collaborative learning, labs and demonstrations, projects and presentations, speeches, debates, panels, conferencing, performances, and learning experiences outside the classroom. Methodology will be selected to best meet student needs.

COURSE OUTLINE

- I. Proper sizing of HVAC Unit

- A. Calculate cubic feet/Electrical/Gas requirement
- B. Calculate air volume
- C. Code required return air volume
- D. Calculate size of unit required
- II. Installing a New Air Handler/Indoor Unit
 - A. Selecting correct size, and Coil needed
 - B. Installing Electrical wiring, safety switch, thermostat, and OCP
 - C. Placing unit according to code, and performing install
 - D. Testing unit after install
- III. Removing old unit
- IV. Installing new plenum duct, and size to fit
- V. Install new flu pipe, gas line, and test prior to using
- VI. Maintenance/Troubleshooting
 - A. Remove covers and test Amperage/Ohms.
 - B. Inspect transformer and control panel connections.
 - C. Flush and clean internal evaporator coil, and burner assembly.
 - D. Test the internal and external pressures, and temperatures of the unit.
 - E. Test all heating assemblies/gas/electric.
 - F. Complete test for Amperage draw FLA/RAL
 - G. Replace Transformer, Thermostat, Control Panel, Gas Valve, Heating Elements, HLS, Ignition switch, Blower motor and assembly, inducer fan, Hot surface ignitor, unit filter.
- VII. Customer Service
 - A. Properly complete the work order
 - B. Conduct service presentation and work order to customer

COURSE LEARNING OUTCOMES AND COMPETENCIES

Upon successful completion of this course, the student will:

- A. Demonstrate the ability to calculate size of unit required
 - 1. Demonstrate how to calculate the size requirement of the Air Handler/Indoor Unit.
 - 2. Demonstrate how to calculate the electrical load requirement of the heating unit.
 - 3. Demonstrate the return air volume required.
- B. Demonstrate the ability to install a new air handler/indoor unit
 - 4. Demonstrate how to properly place/install the new unit.
 - 5. Demonstrate code requirement of gas line, electrical system
 - 6. Demonstrate code requirement of flu pipe
 - 7. Demonstrate how to fabricate new plenum and return duct
 - 8. Demonstrate how to properly test a new unit after install
- C. Demonstrate the ability to disconnect old unit and reclaim usable parts
 - 9. Demonstrate how to properly disconnect old gas line

10. Demonstrate how to properly disconnect old electrical
 11. Demonstrate how to properly dismantle and recycle old unit
- D. Demonstrate the ability to maintenance existing unit.
12. Demonstrate how to remove protective covers and pull amperage readings, and volts readings.
 13. Demonstrate how to test capacitors, transformers, thermostat, fan motor, control panel
 14. Demonstrate how to clean the evaporator coil
 15. Demonstrate how to test the internal and external pressures, and temperatures of the unit.
 16. Demonstrate how to detect any gas leaks
 17. Demonstrate how to replace fan blades
 18. Demonstrate how to inspect burner assembly, heating elements
 19. Demonstrate how to replace capacitors
 20. Demonstrate how to test inducer fan, float switch
 21. Demonstrate how to test HSL, HSI, Gas Valve, Ignitor
 22. Demonstrate how to fill out a work order for any of the work completed.
 23. Demonstrate how to conduct a presentation of the work order to the customer.

ASSESSMENT OF COURSE LEARNING OUTCOMES AND COMPETENCIES

Student progress is evaluated through both formative and summative assessment methods. Specific details may be found in the instructor's course information document.

COLLEGE POLICIES AND PROCEDURES

Student Handbook

<https://www.kckcc.edu/files/docs/student-resources/student-handbook-and-code-of-conduct.pdf>

College Catalog

<https://www.kckcc.edu/academics/catalog/index.html>

College Policies and Statements

<https://www.kckcc.edu/about/policies-statements/index.html>

Accessibility and Accommodations

<https://www.kckcc.edu/academics/resources/student-accessibility-support-services/index.html>.