# ILLINOIS VALLEY COMMUNITY COLLEGE

## COURSE OUTLINE

**DIVISION: Career and Technical Programs**

**COURSE: HVC 1210; Basic Heating**

Date: Spring 2012

Credit Hours: 3

Prerequisite(s): Co-Requisite ELE-1200

Delivery Method:

| | | |
|---|---|---|
| ☒ | **Lecture** | **2 Contact Hours (1 contact = 1 credit hour)** |
| ☐ | **Seminar** | **0 Contact Hours (1 contact = 1 credit hour)** |
| ☒ | **Lab** | **2 Contact Hours (2 contact = 1 credit hour)** |
| ☐ | **Clinical** | **0 Contact Hours (3 contact = 1 credit hour)** |
| ☐ | **Online** | |
| ☐ | **Blended** | |

Offered: ☒ **Fall** ☒ **Spring** ☐ **Summer**

IAI Equivalent –***Only for Transfer Courses***-go to *http://www.itransfer.org*:

**CATALOG DESCRIPTION:**
This course is a beginning course using gas heating to illustrate basic concepts.

## GENERAL EDUCATION GOALS ADDRESSED

*[See the last page of this form for more information.]*

**Upon completion of the course, the student will be able:**

[Choose those goals that apply to this course.]

☐ To apply analytical and problem solving skills to personal, social and professional issues and situations.
☐ To communicate orally and in writing, socially and interpersonally.
☐ To develop an awareness of the contributions made to civilization by the diverse cultures of the world.
☐ To understand and use contemporary technology effectively and to understand its impact on the individual and society.
☐ To work and study effectively both individually and in collaboration with others.
☒ To understand what it means to act ethically and responsibly as an individual in one's career and as a member of society.
☐ To develop and maintain a healthy lifestyle physically, mentally, and spiritually.
☐ To appreciate the ongoing values of learning, self-improvement, and career planning.

## EXPECTED LEARNING OUTCOMES AND RELATED COMPETENCIES:

*[Outcomes related to course specific goals.]*

**Upon completion of the course, the student will be able to:**

Outcome1 : identify and explain the principles of heating, combustion and evolution of comfort heating devices.

Assessment: Students will provide an overview of the combustion process and evolution of the residential heating devices on a written exam.

Outcome 2 : explain the requirements to achieve efficient combustion of fuels and the devices used with the specific type of fuel.

Assessment: Students on written test and laboratory demonstration will demonstrate knowledge of proper combustion parameters.

Outcome 3: identify and explain current heat exchanger design and theory.

Assessment: Students will, on a written test, identify the proper adjustments and settings to achieve proper combustion.

Outcome 4: identify and distinguish the characteristics of primary and secondary heat exchangers and high efficiency heating devices.

Assessment: Students will identify and explain the differences between standard efficient and high efficient (recuperative) furnace designs on a written exam.

Outcome 5: explain combustion testing methods, proper venting methods and the use of diverters and dampers.

Assessment: Students will correctly identify good or bad results of combustion testing results on a written test.

**COURSE TOPICS AND CONTENT REQUIREMENTS÷**

A. History of Heating, Heat Sources and Combustion
B. Orifices, Burners, Heat Exchangers Designs
C. Venting, Draft Diverters, Flue Damper, Combustion Testing
D. Electric Heating
E. Air Flow and Auxiliary Heat

**INSTRUCTIONAL METHODS:**

Lecture
Class discussion
Lab Activities
Field Trips (industry visits)

**INSTRUCTIONAL MATERIALS:**

**STUDENT REQUIREMENTS AND METHODS OF EVALUATION:**

Daily class & lab attendance
Section tests
Comprehensive final
Hands-on Lab Assignments

A= 100-90
B= 89-80
C= 79-70
D= 69-60
F= 50- 0

**TEXTBOOK:**

Warm Air Heating for Climate Control, Cooper, 5th edition, Prentice Hall Publishing Company, 2003.

**OTHER REFERENCES**

Manufacturers Literature and Trouble Shooting Brochures

Course Competency/Assessment Methods Matrix

| **HVC 1210; Basic Heating** | **Assessment Options** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| For each competency/outcome place an "X" below the method of assessment to be used. | **Assessment of Student Learning** | Article Review | Case Studies | Group Projects | Lab Work | Oral Presentations | Pre-Post Tests | Quizzes | Written Exams | Artifact Self Reflection of Growth | Capstone Projects | Comprehensive Written Exit Exam | Course Embedded Questions | Multi-Media Projects | Observation | Writing Samples | Portfolio Evaluation | Real World Projects | Reflective Journals | Applied Application (skills) Test | Oral Exit Interviews | Accreditation Reviews/Reports | Advisory Council Feedback | Employer Surveys | Graduate Surveys | Internship/Practicum /Site Supervisor Evaluation | Licensing Exam | In Class Feedback | Simulation | Interview | Written Report | Assignment |
| Assessment Measures – Are direct or indirect as indicated. List competencies/outcomes below. | **Direct/ Indirect** | D | D | D | D | D | D | D | D | D | D | D | D | D | D | D | D | D | D | D | I | I | I | I | D | D | | | | | | |
| Outcome1 : identify and explain the principles of heating, combustion and evolution of comfort heating devices. | | | | | | X | | X | | | | | | | X | | | | | | | | | | | | | | | | |
| Outcome 2 : explain the requirements to achieve efficient combustion of fuels and the devices used with the specific type of fuel. | | | | | X | X | | X | | | | | | | X | | | | | | | | | | | | | | | | |
| Outcome 3: identify and explain current heat exchanger design and theory. | | | | | | X | | X | | | | | | | X | | | | | | | | | | | | | | | | |
| Outcome 4: identify and distinguish the characteristics of primary and secondary heat exchangers and high efficiency heating devices. | | | | | | X | | X | | | | | | | X | | | | | | | | | | | | | | | | |
| Outcome 5: explain combustion testing methods, proper venting methods and the use of diverters and dampers. | | | | | | X | | | | | | | | | X | | | | | | | | | | | | | | | | |