

COURSE SYLLABUS

ENT 105 BASIC HVACR

I. Division Name: Energy Technology Department, Technology Division

II. Course Number & Title: MFMT 105 Basic HVACR

III. Credit Hours: 2 Cr Hrs

IV. Total Contact Hours: 32 Contact Hrs

V. Prerequisite: This is a course which must be taken on the computer and students taking the course must be computer literate using basic DOS, Windows, word processing, e-mail, Internet and other computer capabilities effectively. (For students who are not computer literate, it is recommended that they complete the computer literacy course MFMT 103 prior to or concurrently with this course) Your computer equipment must be connected to an Internet service and have Internet capability. This course offers limited assistance in using the computer and using software for the various programs noted above. The course is not designed for it nor is the instructor obligated to troubleshoot your equipment, your computer software or your computer systems. For students who do not have access to a computer at home, arrangements of their schedule must be made to regularly access on-campus computers in the library or computer labs, or make arrangements to access computers which are available to the public through local libraries, local businesses such as Kinkos or rent or lease a computer to complete assignments.

VI. Co-requisites: None

VII. Course Grading Scale: Identified Below Regular College A-E

VIII. Catalog Description:

A basic course in heating, air conditioning and refrigeration providing the learner with exposure to the basic principles, tools, materials, equipment and components in each of the major subject areas. The course provides orientation to the multi-skilled technician's job in the HVACR field for building engineers, power engineers, process operating and maintenance technicians and others engaged in HVACR operations.

IX. Course Goals

Overview

Energy Technology courses and programs provide students with the capability to meet or exceed the requirements for entry and advanced level multi-functional power or process plant engineers, boiler operators or heating plant operators, building engineers, HVAC heating and cooling service technicians, instrument and control technicians, and multi-skilled maintenance technicians. All courses in each program are performance-based, practically oriented to field conditions and are designed to ensure On-Line students meet minimum Licensing Requirements of local and national licensing agencies and as possible National Skills Standards.

Each course either, basic or advanced, provides students with the capability to meet or exceed the requirements identified by national organizations for entry level multi functional residential and light commercial HVAC service technicians, multi-functional power or process plant engineers, boiler operators or heating plant operators, building engineers. Courses include National Skills Standards requirements as specified by several nationally recognized heating/cooling field organizations including ARI/GAMA, (Air-Conditioning & Refrigeration Institute) and as specified by several internationally recognized power field organizations including NIULPE (National Institute for the Uniform Licensing of

Power Engineers), local licensing agencies, VTECS (Southern Association of College and Schools), and National Skills Standards studies by HFCC faculty currently under way or completed for the occupation of power/building engineer.

Energy Technology On-Line courses and programs are computer-intensive requiring multi-skilled activities in a computerized environment and as possible a practical field orientation to assignments in multiple-activities on-line settings.

Required Computer Skills

Students who take classroom courses and/or on-line or web-based courses in the Energy Technology Program should be familiar with the basic word processor functions (such as found in MS Word Note Pad, Word Pad or WordPerfect for Windows. Students should have some experience using e-mail, have had experiences using typical search engines (such as Yahoo, Goggle or Excite) and accessing and utilizing the Internet to find information and materials from suppliers, library resources or other data banks. Students should also have easy, regular, dependable access to a personal computer with a word processor and browser (such as Internet Explorer) to allow continuing Internet access during the semester. Students can utilize classroom computers to complete the majority of their assignments for classroom and web-based courses. However, students enrolled in on-line courses must have continuing access to a computer and the Internet throughout the semester usually apart from the college computers. While the Media Center and the Library computers can be used to complete on-line work for various courses, depending on them as the only computer source is not advised for on-line study.

During busy periods, accessing a computer may be difficult, and students will need to conform to the Media Center's hours. Therefore, it is recommended that students consider only using the Media Center as a backup to PC's at home, work or those open to public use at off-campus locations.. Students lacking basic computer skills should consider taking the MFMT 103 Computer Maintenance & Energy Technology - basic computer orientation course prior to or in conjunction with their initial (or first) course study in the Energy Technology Department.

HFCC Unplugged!

Now you can now access free wireless Internet service from more locations on HFCC's main campus. In addition to the Eshleman Library and the Student & Culinary Arts Center, the campus wireless network now encompasses the Technology Building and the Learning Technology Center. The wireless network, nicknamed "HFCC Unplugged," is available from 6 a.m. to 10 p.m. daily.

The wireless network gives students with laptops and PDAs (personal digital assistants) the freedom to connect to the Internet without wires. If you have a laptop, but need a wireless network card, check out the College Store, which sells network cards at competitive prices.

X. Core & Course Objectives

A) Major Core Course Subject Areas: Focus of Assessment Course Objectives:

The course is developed in a modularized form to allow each module. It is recommended that students carefully study all sections, even if they have extensive experience, to ensure complete coverage and review of the subject materials. In special cases, after background review and approval by an instructor, students who have previous skills and verifiable experiences can opt to only complete the exams and lab exercises at various points in the course.

Mandatory period for completion of the course: Students enrolling in the course will be expected to complete the course in the time period of one semester. Students should progress at the rate of one module or more per week.

B) Methods for Measuring Achievement of Objectives:

1. Practical assessment tests at the completion of each module are required.

2. Internet exploration and research assignments are required ensuring enhancement of the learning for process for the student through interfacing directly with industry manufacturers, organizations, associations, data bases and similar resources.

3. Adhering to National Standards is required and included in the course for achievement and is based on the developed national skill standards and licensing examination standards of various licensing agencies.

4. Learners are required to complete readings-subject matter study; workbook/written activities related to readings/lecture/study materials; live, simulated or online laboratory activities; 4) written and/or on-line exams; reports and projects; internet exploration assignments; and other assignments as specified by course outlines or the instructor.

C) Core Objectives-Application (Measurable*)

**(Students will be able to identify, describe, analyze proper procedures and document acceptable practices for equipment and systems in a practical field environment in each of the areas indicated below.)

1. Identifies hi/lo sides refrigeration cycle-all types of systems
2. Compressor orientation - identifies manufacturers nameplate data
- 4.* Compares tests and analyses to industry standards
5. Describes proper results for compressor field tests
6. Identifies parts-components of typical air conditioning systems
7. Demonstrates knowledge of system charging manifold
8. Demonstrates safe application of charging manifold
- 9.*Tests, analyzes, determines system capability
10. Identifies proper location of components on sketches
11. Identifies proper piping-tubing sketches for projects
12. Identifies proper procedures for brazing, soldering and tubing tools
13. Identifies refrigerant characteristics - for most common refrigerants

14. Demonstrates safe and proper use of Psychrometric chart
- 15.*Analyzes, capability for heating- cooling system capacity
- 16.* Determines system capability based upon planned service checks

D) Course Topics

Refrigeration-Air Conditioning-Heating Principles

-Refrigeration Practices

Heating Principles And Practices

-Heating Principles

Air Conditioning Principles And Practices

-Air Conditioning Principles

-Air Conditioning Practices

Mechanical Rach Systems Principles And Practices

-Piping Principles

-Tubing Practices

HVACR Terms, Tools, Materials-Review, Discuss/Explain Basic Data

Residential , Commercial And Industrial HVACR Systems And Equipment

Basic Air Distribution, Measuring And Cleaning Systems

XI. Course Textbook & Materials

Required Text/s:

1) Modern Refrigeration AC, Goodheart & Wilcox

2) Workbook, Modern Refrigeration, Goodheart & Wilcox (Or)

3) (Handouts or Workbook from this and other materials -when specified, available and

necessary)

4) Basic hand-held calculator (would be highly helpful) or access calculator on computer- to be used in class

Course Materials

The following materials are required for all students in classroom, and web-based sections. Students must come to every class with the textbook, workbook, a notebook, handouts, and projects and if applicable, floppy disks on which to collect data. Students when working Online should have all texts, notes and other course materials available when access the course on the computer or any course assignments.

XII. Course Grading Policy

A) Grading Policies:

Fulfilling course objectives and assignments requires that each student complete a range of assignments. In addition to exercises assigned throughout the semester. All Energy Technology courses include varying levels of the following elements:

- 1) Readings-Subject Matter Study: Access subject materials from texts, handouts, assigned resources and recommended materials.
- 2) Workbook/Written Activities Related to Readings/Lecture: Completion of assignments related to readings including answering text chapter questions, workbook questions, exercises and sketches.
- 3) Laboratory Activities: Completion of laboratory and hands-on exercises along with their related results reports and-or field experiences which duplicate laboratory hands-on experiences through live field activities.
- 4) Written and/or On-Line Exams:
 - a) Completion of required written or on-line exams for each unit/module for each course when required.
 - b) Completion of proctored written or on-line final and/or mid-term exams for each course.
 - c) Completion of standardized competency, license and certification exams (if appropriate and provided for the course such as those provided by ARI, NIULPE, EPA and others)
 - d) Completion of short quizzes, practical lab exams, classroom-lab practical exercises and other activities used to check progress, understandings and prerequisites for advanced study in a course.
- 5) Reports, Projects: Completion of individual reports, papers, projects, presentations assigned by the instructor.
- 6) Internet Exploration Assignments: Completion of a minimum of four to eight subject-matter enhancement activities/reports by obtaining information and data on the Internet relative to the course subject matter.
- 7) Attendance: Classroom session for 50% on-line courses are mandatory to accomplish lecture/discussion and other assignments including labs and research. There is no mandatory classroom attendance for totally on-line courses. In the totally on-line courses optional open labs are offered for students who desire hands-on experiences and/or direct study to answer questions and work on license exam preparation with an instructor.
- 8) Grades are based upon the regular HFCC College scale as follows:
Below 70=E, 70 to 74=D, 75 to 84=C, 85 to 94=B, 95 to 100=A

B) Each instructor will determine the percentage of the allocated to the individual elements for a course as noted above. A "typical" (but not mandatory) assignment of percentages is as follows:

(Individual instructors may vary these percentages in the course they are teaching)

- 1) Readings-Subject Matter Study 5-20%
 - 2) Workbook/Written Activities Related to Readings/Lecture 20-30%*
 - 3) Laboratory Activities (Optional - 5-20%)*
 - 4) Written and/or On-Line Exams 50-60%*
 - 5) Reports, Projects 5-20%*
 - 6) Internet Exploration Assignments 10-20%*
 - 7) Attendance (Not required-May attend Option Open Labs)
- TOTAL - 100%

Note::

*Items which may be adjusted by an instructor significantly upward or downward in totally on-line courses reflect activities for that mode of instruction.

XIII. Participation & Drop Policy

Students are expected to complete all weekly assignments and activities contained within this course. Penalties may be imposed, at the discretion of the individual instructor, whenever the quality of the student's work has been affected by non-participation and non-completion of course assignments and activities.

Course Participation/Attendance-On-Line Courses:

Students in Energy Technology on-line courses are expected to be involved in a minimum of one scheduled instructional activity per week. To meet this expectation, learners must make contact with the course or instructor on a weekly basis through one of the following methods:

- 1) Completing an assignment (e.g., an exam, project, etc.) in the Exam or Assignment of the course web site.
- 2) Participation in a threaded discussion in the course web site Discussion Board (e.g., commenting on a discussion question posted by the faculty, posing a question or asking a questions, providing feedback to another Learner, etc.).
- 3) Viewing instructional materials (e.g., Notes or data provided in announcements or assignments, a PowerPoint presentation prepared by faculty, a streaming audio or video presentation, etc.).
- 4) Students must use the UCompass Messaging system on the course web site to contact faculty and/or other students in the course.

IMPORTANT!! Students who fail to make weekly contact within the time period of one month may be notified that they will be withdrawn or suspended from the course.

Assignment Submissions:

In most instances, students will responding with completed assignments by taking an exam, entering data collected, using the Discussion Board to participate in a discussion, entering the Chat Room to participate in a "live" Chat session with the instructor and-or other students, or sending an assignment to the instructor via e-mail. Make sure when completing each assignment that you submit only one assignment at a time. Bulk (multiple) assignments will not be accepted.

Communication:

When you send an e-mail or "create" a new assignment or complete course work, (IMPORTANT) Use the first few lines of any communication to indicate your name, course number and section, assignment and Module Number.

File Format:

When sending any information in a "file" format - Save the file in RTF (Rich Text Format) in your word processor before you attach this file to your correspondence. RTF (Rich Text Format) will allow the instructor to gain quick access to any file from any word processor to speed up the grading and review process.

Discussion-Chat:

This course allows students to post to a Class Discussion Forum or participate in Chat Room activities. You can locate the Discussion Board forum or Chatroom by clicking on them on the left side of your Ucompass Main Screen. Discussion Forums topics provided by the instructor or students remain up most of the semester for continued access by students. Use the instructor discussion forum when a question arises or a concern or information may need to be provided. Chatroom usage may be scheduled by the instructor or may be used by the instructor to work with students.

Tuition Refunds (Tentative Information-Check the most current catalog for up to date information!)

Refunds on tuition and fees (except registration fees) may be obtained on all classes of fifteen-week duration officially dropped according to the following schedule:

NOTE: (Check with registrar as to the current and correct refund policies)

100% 1st week of classes

50% 2nd week of classes

No tuition refunds are given after the end of the second week of classes and no exceptions are made for students who enter late. Courses of other than fifteen-week duration have differing refund schedules. Details may be obtained in the Office of the Registrar. Students receiving federal financial aid have additional refund options available to them. They should review the brochure Financial Aid Information Guide and Consumer Information Supplement, available in the Financial Aid Office.

XIV. Online Conduct Policy

A) Students at HFCC are expected to show respect for order, law, the personal rights of others, and the educational mission of the College, as well as to maintain standards of personal integrity.

B) Students working online will be held to the same behavioral standards as students in traditional classrooms.

Please be aware that instructors will be observing your threaded discussions with each other, and may review those discussions, commenting where appropriate with the goal of helping you to better understand the course content. Specifically, you should adhere to the following guidelines:

- Personal correspondence should be conducted elsewhere.
- Treat and respect others as you would like to be treated.
- "Flaming", an angry series of words or comments used to personally attack others who may disagree with you, is not permitted.
- Take time to review the tone, language, word choice, spelling, and grammar of any written correspondence prior to sending it. You will be judged by the quality of your work.
- HFCC's computer use policy is in effect. It can be found at <http://www2.hfcc.edu/resources/policy.htm>.
- Students are responsible for completing their own online course work.

XV. Academic Dishonesty Policy on Academic Dishonesty (Cheating)

A) College Policy on Academic Dishonesty (Cheating)

Henry Ford Community College considers academic dishonesty to be a serious offense. It is the policy of the College that determination of and appropriate action in respect to academic dishonesty by a student shall be a matter of individual judgment by the instructor. The instructor may administer a penalty up to and including failure in the particular course. It is the professional obligation of the faculty to enforce academic integrity in their courses.

Academic dishonesty is any activity intended to improve a student's grade fraudulently.* It includes, but is not limited to, the following:

1. Unauthorized acquisition of tests or alteration of grades (such as the stealing of tests, test keys, or grade books from faculty offices or elsewhere, or the purchasing of tests or grade books);
2. Unauthorized use of notes, books, or other prohibited materials during an examination;
3. Open cheating on an examination (such as copying from another student's paper);
4. Permitting another person to take a test in the student's place or receiving unauthorized assistance with any work for which academic credit is received;
5. Providing unauthorized assistance with any work for which academic credit is received;
6. Revision of graded work in an attempt to receive additional credit fraudulently;
7. Plagiarism (using another person's work without acknowledgment);
8. Any other conduct intended to obtain academic credit fraudulently or dishonestly.

B) Energy Technology Policy for Computer-Utilized, On-Line and Web-Based Courses

The following practices for students taking Energy Technology courses are considered improper and prohibited according to the Academic Dishonesty Policy or as a violation of the Copyright Act:

- 1) Submitting Xerographic-type copies of any work - All work should be original and submitted in original writing-printing.
- 2) **VERY IMPORTANT** - Copying or reproducing tests or examinations for classroom, web-based or on-line courses - This material is covered by the copyright act and as such is proprietary to the instructor of the college and is **NOT** to be reproduced **UNDER ANY** circumstances.

IMPORTANT! Copying the exams and/or answers to written or computerized exams is considered grounds for immediate failure in the course and possible dismissal from the college according to the Academic Dishonesty Policy!

Assignments, student completion sheets, forms, handouts, course packs, computer links and other material provided by instructors may be copied (usually in one copy only as required) by students for their individual use in completing course activities.

- 3) Completing specifically identified computerized final exams or written exams with the help or assistance of another person or having another person complete work on any of your exams and submitting this work as your own.
- 4) Falsifying assignments, copying another person's work, or completing any worksheets, lab assignments, or required hands-on lab exercise sheets - which require actual hands-on lab or research work to be completed prior to submission.

XVI. Student Support Services

Instructional Technology & Tech Buddies

If you require assistance accessing UCompass Educator courses, please contact

Instructional Technology at 313.845.9663, ext. 3, 4, or 5 or via e-mail at signorelli@hfcc.edu, kolin@hfcc.edu, or vbeaty@hfcc.edu.

On-campus assistance is also available in the Student Center at the Tech Buddy Desk or within Instructional Technology, Monday - Friday, 8:30 a.m. - 4:30 p.m. Instructional Technology is located on the lower level of the Learning Technology Center (same building as Campus Safety), room A-004.

Media Center

Located on the second floor of the Library, the Media Center is an open access computer lab where students can go to work on computer assignments, access the Internet, and/or check their e-mail. For more information, you may contact the Media Center at 313.845.6386. For more information regarding Library Services, you may phone 313.845.9606.

Assisted Learning Services

The Assisted Learning Services Program is designed to assist physically challenged, learning disabled, or academically disadvantaged students at Henry Ford Community College to overcome barriers to education through supportive services. In addition, the Assisted Learning Services Department also provides tutoring services to the general student population. Assisted Learning Services is located in the LRC (Learning Resources Center), north side (parking lot side) main level. For more information, you may contact the office at 313.845.9617 or for the hearing impaired 313.845.9804.

Learning Lab

Located on the second floor of the Learning Resource Center, the Learning Lab assist HFCC students with identifying and improving the skills needed for success in the areas of Reading, Writing, and Math.

Although operation hours may slightly vary each semester generally, the Learning Lab is open Monday, Tuesday, Wednesday, Thursday, from 7:30 a.m. – 8:40 p.m., on Friday from 7:30 a.m. – 4:30 p.m., and Saturday from 9:40 a.m. – 1:40 p.m. For more information, contact the Learning Lab at 313.845.9643.