

# SYLLABUS

**DIVISION:** Business and Engineering Technology

**REVISED:** Summer 2014

**CURRICULA IN WHICH COURSE IS TAUGHT:** Air Conditioning & Refrigeration

**COURSE NUMBER AND TITLE:** Air 273 Refrigeration III

**CREDIT HOURS: 3 HOURS/WK LEC: 2 HOURS/WK LAB: 3 LEC/LAB COMB: 5**

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**I. CATALOG DESCRIPTION:** Studies heat pumps, sizing, installation, and servicing, reciprocating chillers and centrifugal air conditioners.

**II. RELATIONSHIP OF THE COURSE TO CURRICULA OBJECTIVES:**

- Acquire an understanding of the basic principles of the operation of heat pumps
- Acquire an understanding of the components that make up a heat pump
- Gain an understanding of how to troubleshoot a heat pump system

**III. REQUIRED BACKGROUND/PREREQUISITIES:**

- Air 271-272

**IV. COURSE CONTENT:**

- Operation of the heat pump
- Components
- Troubleshooting

**V. THE FOLLOWING GENERAL EDUCATION OBJECTIVES WILL BE ADDRESSED IN THIS COURSE (Place X by all that apply)**

**1. Communication**

- 1.1 understand and interpret complex materials;
- 1.2 assimilate, organize, develop, and present an idea formally and informally;
- 1.3 use standard English;
- 1.4 use appropriate verbal and non-verbal responses in interpersonal relations and group discussions;
- 1.5 use listening skills; and
- 1.6 recognize the role of culture in communication.

**2. Critical Thinking**

- 2.1 discriminate among degrees of credibility, accuracy, and reliability of inferences drawn from given data;
- 2.2 recognize parallels, assumptions, or presuppositions in any given source of information;
- 2.3 evaluate the strengths and relevance of arguments on a particular question or issue;
- 2.4 weigh evidence and decide if generalizations or conclusions based on the given data are warranted;
- 2.5 determine whether certain conclusions or consequences are supported by the information provided; and
- 2.6 use problem solving skills.

**3. Cultural and Social Understanding**

- 3.1 assess the impact that social institutions have on individuals and culture—past, present, and future;
- 3.2 describe their own as well as others' personal ethical systems and values within social institutions; and
- 3.3 recognize the impact that arts and humanities have upon individuals and cultures.
- 3.4 recognize the role of language in social and cultural contexts.

3.5 recognize the interdependence of distinctive world-wide social, economic, geopolitical, and cultural systems

**4. Information Literacy**

- 4.1 determine the nature and extent of the information needed;
- 4.2 access needed information effectively and efficiently;
- 4.3 evaluate information and its sources critically and incorporate selected information into his or her knowledge base;
- 4.4 use information effectively, individually or as a member of a group, to accomplish a specific purpose; and
- 4.5 understand many of the economic, legal, and social issues surrounding the use of information and access and use information ethically and legally.

**5. Personal Development**

- 5.1 develop and/or refine personal wellness goals; and
- 5.2 develop and/or enhance the knowledge, skills, and understanding to make informed academic, social, personal, career, and interpersonal decisions.

**6. Quantitative Reasoning**

- 6.1 use logical and mathematical reasoning within the context of various disciplines;
- 6.2 interpret and use mathematical formulas;
- 6.3 interpret mathematical models such as graphs, tables and schematics and draw inferences from them;
- 6.4 use graphical, symbolic, and numerical methods to analyze, organize, and interpret data;
- 6.5 estimate and consider answers to mathematical problems in order to determine reasonableness; and
- 6.6 represent mathematical information numerically, symbolically, and visually, using graphs and charts.

**7. Scientific Reasoning**

- 7.1 generate an empirically evidenced and logical argument;
- 7.2 distinguish a scientific argument from a non-scientific argument;
- 7.3 reason by deduction, induction and analogy;
- 7.4 distinguish between causal and correlational relationships; and
- 7.5 recognize methods of inquiry that lead to scientific knowledge

**VI. LEARNER OUTCOMES**

**VII. EVALUATION**

<p><b>Principles of heat pump operation:</b></p> <ul style="list-style-type: none"> <li>• Understanding the differences between a heat pump and an a/c system</li> <li>• How a heat pump works</li> <li>• Benefits of a heat pump system</li> </ul>	<p><b>Evaluation method</b></p> <p>Lab exercises Written test</p>
<p><b>Components of a heat pump system</b></p> <ul style="list-style-type: none"> <li>• Identify the different components and how they operate</li> <li>• Sizing the heat pump</li> <li>• Benefits</li> </ul>	<p><b>Evaluation method</b></p> <p>Lab exercises Written test</p>
<p><b>Troubleshooting</b></p> <ul style="list-style-type: none"> <li>• Troubleshooting the different components</li> <li>• Understanding the proper operation of the heat pump</li> <li>• Identify the components</li> <li>•</li> </ul>	<p><b>Evaluation method</b></p> <p>Lab exercises In class assignments Written test</p>