

**STATE UNIVERSITY OF NEW YORK
COLLEGE OF TECHNOLOGY
CANTON, NEW YORK**



MASTER SYLLABUS

**COURSE NUMBER – COURSE NAME
ACHP105 – HVAC Systems Design**

Created by: Stan Skowronek

Updated by: Michael J. Newtown, P.E.

Canino School of Engineering Technology

Department: Mechanical & Energy Systems

Semester/Year: Fall 2021

A. **TITLE:** HVAC Systems Design

B. **COURSE NUMBER:** ACHP105

C. **CREDIT HOURS:** (Hours of Lecture, Laboratory, Recitation, Tutorial, Activity)

Credit Hours: 2

Lecture Hours: 2 per week

Lab Hours: per week

Other: per week

Course Length: 15 Weeks

D. **WRITING INTENSIVE COURSE:** Yes No

E. **GER CATEGORY:** None: Yes: GER
If course satisfies more than one: GER

F. **SEMESTER(S) OFFERED:** Fall Spring Fall & Spring

G. **COURSE DESCRIPTION:**

The HVAC system and its component parts is studied in detail. Components are sized and selected to meet application requirements and then system equilibrium is determined.

H. **PRE-REQUISITES:** None Yes If yes, list below:

CO-REQUISITES: None Yes If yes, list below:

I. STUDENT LEARNING OUTCOMES: (see key below)

By the end of this course, the student will be able to:

<u>Course Student Learning Outcome</u> <u>[SLO]</u>	<u>Program Student Learning Outcome</u> <u>[PSLO]</u>	<u>GER</u> <i>[If Applicable]</i>	<u>ISLO & SUBSETS</u>	
ACHP105.1 Commercial Refrigeration Equipment Calculate load for a walk in cooler	1. Gain the skills to begin a career in refrigeration and air conditioning service.	N/A	5-Ind, Prof, Disc, Know Skills ISLO ISLO	W Subsets Subsets Subsets
ACHP105.2 Air Conditioning Load Calculate load and select equipment for an air conditioning system	2. Learn how to install and service refrigeration and air conditioning equipment for residential and commercial buildings.	N/A	5-Ind, Prof, Disc, Know Skills ISLO ISLO	W Subsets Subsets Subsets
ACHP105.3 Commercial Ductwork Calculate ductwork requirements for a commercial building	1. Gain the skills to begin a career in refrigeration and air conditioning service.	N/A	5-Ind, Prof, Disc, Know Skills ISLO ISLO	W Subsets Subsets Subsets
ACHP105.4 Residential HVAC Prepare design proposal for a residential HVAC system	3. Students will learn to communicate properly in the language of equipment installation & service	N/A	1-Comm Skills ISLO ISLO	W Subsets Subsets Subsets
ACHP105.5 Industry Standards Apply manufacturer engineering guides to pick out equipment. Navigate supplier catalogs to source components	1. Gain the skills to begin a career in refrigeration and air conditioning service 3. Students will learn to communicate properly in the language of equipment installation & service.	N/A	1-Comm Skills ISLO ISLO	O W Subsets Subsets

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KEY	<u>Institutional Student Learning Outcomes [ISLO 1 – 5]</u>
ISLO #	ISLO & Subsets
1	Communication Skills Oral [O], Written [W]
2	Critical Thinking <i>Critical Analysis [CA], Inquiry & Analysis [IA], Problem Solving [PS]</i>
3	Foundational Skills <i>Information Management [IM], Quantitative Lit./Reasoning [QTR]</i>
4	Social Responsibility <i>Ethical Reasoning [ER], Global Learning [GL], Intercultural Knowledge [IK], Teamwork [T]</i>
5	Industry, Professional, Discipline Specific Knowledge and Skills

*Include program objectives if applicable. Please consult with Program Coordinator

J. **APPLIED LEARNING COMPONENT:** Yes No

If YES, select one or more of the following categories:

- | | |
|---|--|
| <input checked="" type="checkbox"/> Classroom/Lab | <input type="checkbox"/> Civic Engagement |
| <input type="checkbox"/> Internship | <input type="checkbox"/> Creative Works/Senior Project |
| <input type="checkbox"/> Clinical Placement | <input type="checkbox"/> Research |
| <input type="checkbox"/> Practicum | <input type="checkbox"/> Entrepreneurship |
| <input type="checkbox"/> Service Learning | (program, class, project) |
| <input type="checkbox"/> Community Service | |

K. **TEXTS:**

Althouse, Turnquist, Bracciano. 19th edition, Modern Refrigeration and Air Conditioning.
Goodheart-Willcox

L. **REFERENCES:**

N/A

M. **EQUIPMENT:** None Needed:

N. **GRADING METHOD:** A-F

O. **SUGGESTED MEASUREMENT CRITERIA/METHODS:**

Design projects

P. **DETAILED COURSE OUTLINE:**

1. Refrigeration
 - 1.1. Cooler load calculations
 - 1.2. Cabinet Design
 - 1.3. Equipment design
 - 1.4. Equipment selection
2. Residential HVAC
 - 2.1. Heat Load
 - 2.2. Cooling Load
 - 2.3. Ventilation
 - 2.4. Equipment selection
 - 2.5. Design proposal
3. Commercial Ductwork
 - 3.1. Ductwork calculations
 - 3.2. Design
 - 3.3. Specification
 - 3.4. Ductwork Sketching
4. Equipment Sourcing
 - 4.1. Refrigeration

4.2. Heating

4.3. Residential cooling

Q. LABORATORY OUTLINE: None Yes