

COURSE OUTLINE

Industrial Technology 207
CAQI/QM/QS System Economizer Module

I. Catalog Statement

Industrial Technology 207 examines the knowledge required to establish an economizer system's diagnostic process. This includes the operating aspects ultimately applied to that process which conclude with the system working safely, reliably, and operating at the highest capacity and energy efficiency possible.

Total Lecture Units: 1.0

Total Course Units: 1.0

Lecture Hours: 16.0

Total Faculty Contact Hours: 16.0

Recommended Preparation: Eligibility for ENGL 120 or ESL 151.

II. Course Entry Expectations

Prior to enrolling in the course, the student should be able to:

1. summarize, analyze, and synthesize information, express and apply standards for judgment, compare and contrast, and evaluate evidence in order to form and state reasoned opinions;
2. demonstrate a command of grammar, diction, syntax, and mechanics sufficient for college level work: control of standard English at the sentence level, with few major errors in grammar and punctuation.

III. Course Exit Standards

Upon successful completion of the required coursework, the student should be able to:

1. diagnose a system in a dynamic environment;
2. identify the root cause of a symptom;
3. obtain the measurements of a system that will allow you to determine a system's capacity and efficiency

IV. <u>Course Content</u>	Total Faculty Contact Hours = 16
A. Economizer Systems	4 hours
1. Common types of systems	
2. Digital economizer systems	
3. Controller check out information	
4. Flash demonstrations of economizer systems	
5. Honeywell Commercial Savings Estimator	
6. Airside, automation, and packaged systems	
7. California Title 24 requirements	
B. Economizer Hardware, Installation, and Maintenance	4 hours
1. Linkages, setups, and adjustments	
2. Gear driven damper systems	
3. Side linkage systems	
4. Digital economizer controllers and sensors	
5. Honeywell and Belimo systems	
6. Thermostats	
7. Manometers, multi meters, and psychrometers,	
8. Anemometer, capture hoods, and tachometers	
C. System Diagnostics in a Dynamic Environment	4 hours
1. Total head, dry bulb heat, and relative humidity	
2. Psychometric charts	
3. System diagnostic procedures using analog and enthalpy sensors	
4. Fault diagnosis using the economizer controller	
D. Trouble Shooting Complex Economizer Subsystems	4 hours
1. Troubleshoot economizer systems that use adjustable dampers, spring return dampers, and a variety of controllers	
2. Demonstration of economizer troubleshooting procedures	
3. Review troubleshooting procedures on economizer systems	

V. Methods of Instructions

The following methods of instruction may be used in the course:

1. lecture;
2. demonstrations;
3. multi-media;
4. guest speakers.

VI. Out of Class Assignments

The following out of class assignments may be used in the course:

1. essay (e.g. write a response to economizer troubleshooting scenario/s);
2. essay (e.g. solve for the most efficient economizer installation for an assigned building).

VII. Methods of Evaluation

The following methods of evaluation may be used in the course:

1. quizzes;
2. final examination.

VIII. Textbooks

Institute of Heating and Air Conditioning Industries, Inc. *IHACI – Economizer Module*.

Glendale: Institute of Heating and Air Conditioning Industries, 2014. Print.

12th Grade Textbook Reading Level.

IX. Student Learning Outcomes

Upon successful completion of the required coursework, the student will be able to:

1. describe the step by step method of diagnosing heating and ventilation economizer problems in a dynamic environment;
2. use and evaluate data with applicable instruments/tools;
3. identify proper and improper HVAC economizer installations.