## Energy Management (HART 1451)

**Credit:** 4 semester credit hours (2 hours lecture, 6 hours lab)

**Prerequisite/Co-requisite**: N/A

## Course Description

A study of basic heat transfer theory; sensible and latent heat loads; building envelope construction; insulation, lighting, and fenestration types; and conducting energy audit procedures.

## Required Textbook and Materials

1. Electricity for Refrigeration, Heating and Air Conditioning by Russell E. Smith, 9th edition.
    a. ISBN number is 10: 1-285-17998-6
2. Modern Refrigeration and Air Conditioning by Althouse, Turnquist, and Braccian, 19th edition
    a. ISBN number is 978-1-61960-199-4

## Course Objectives

Upon completion of this course, the student will be able to

1. Calculate sensible and latent heat loads.
2. Calculate heat transfer characteristics.
3. Install energy saving devices.
4. Measure energy consumption.

## Course Outline

A. Basic Heat load computation
    1. How to measure square footage
    2. Determining insulation qualities of windows
    3. Determining insulation qualities of doors
    4. Determining insulation qualities of construction materials
B. Conducting energy audits
    1. Calculating watts
    2. Calculating Seasonal Energy Efficiency Rating
    3. Evaluating duct systems
    4. Evaluating evaporator performance
    5. Evaluating condenser performance
C. Effect of installation of new systems on energy bill
    1. Discussion of new duct construction standards

2. Discussion of new government regulated SEER rating
3. Discussion of new refrigerants on energy consumption

D. Measuring energy consumption
1. How to take amp readings
2. How to measure voltage
3. How to measure voltage conversion
4. Overall effect of energy management on air conditioning systems

## Grade Scale

A = 90 - 100

B = 80 - 89

C = 70 - 79

D = 60 - 69

F = 0 - 59

## Course Evaluation

1. 4 Objective Test 34%
2. Comprehensive Final 33%
3. Homework/Lab work 33%

## Course Requirements

1. Homework assignments
2. Hands on lab activities
3. Complete comprehensive final

## Course Policies

1. There will be *no* horseplay tolerated.
2. No open foot shoes, sandals, or flip-flops: closed foot shoes *only*.
3. No smoking, eating, or sleeping will be tolerated during class.
4. If an assignment is late, there will be 5 points deducted per day.
5. No hanging jewelry or rings in lab.

## Disabilities Statement

The Americans with Disabilities Act of 1992 and Section 504 of the Rehabilitation Act of 1973 are federal anti-discrimination statutes that provide comprehensive civil rights for persons with documented disabilities be guaranteed a learning environment that provides for reasonable accommodations for their disabilities. If you believe you have a disability requiring an accommodation, please contact the Special Populations Coordinator office located in the Cecil Beeson Building, room 120.

HART 1451
Course Syllabus

## Student Code of Conduct Statement

It is the responsibility of all registered Lamar Institute of Technology students to access, read, understand and abide by all published policies, regulations, and procedures listed in the *LIT Catalog and Student Handbook*. The *LIT Catalog and Student Handbook* may be accessed at www.lit.edu or obtained in print upon request at the Student Services Office. Please note that the online version of the *LIT Catalog and Student Handbook* supersedes all other versions of the same document.

## Course Schedule

| Week | Topic | Reference |
|---|---|---|
| **1** | Basic heat load computation | Hand out drawings |
| **2 & 3** | Measurement of square footage | Lab tools |
| **4** | Determining insulation qualities of windows | Lab examples |
| **5** | Determining insulation qualities of doors | Lab examples |
| **6** | Determining insulation qualities of materials | Site visits of newly constructed homes |
| **7** | Calculating watts | pages 31-35 |
| **8** | Calculating Seasonal energy efficiency rating | manufacturer's instructions |
| **9** | Evaluating duct systems | examples in A/C labs |
| **10 & 11** | Evaluating evaporator and condoner performance | Students' home |
| **12** | Discussion of new duct construction standards | NAIMA residential duct construction standards book |
| **13** | Discussion of new government regulated SEER rating | manufacturer's instructions |
| **14** | Discussion of new refrigerants on energy consumption | Esco institute |
| **15** | Review for Comprehensive final | |
| **16** | Comprehensive final | |

## Contact Information:


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**Office Hours:** 11:00a.m.-12:30p.m.