

**MIAMI UNIVERSITY
SCHOOL OF ENGINEERING AND APPLIED SCIENCE
DEPARTMENT OF ENGINEERING TECHNOLOGY**

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| ENT 312 | Thermodynamics and Heat Power | 3 |
| Course Number | Title | Credit Hours |

PREREQUISITES BY COURSE

MTH 151, PHY 172, and completion of an engineering technology associate degree or permission of instructor.

DESCRIPTION

Fundamental concepts of energy transformation and transport including heat transfer through conduction, convection, and radiation are introduced. The First and Second Laws of Thermodynamics are applied to process and cycle analysis.

PERIODS PER WEEK 2 Lecture/Laboratory

GENERAL OBJECTIVES

Upon completion of the course the student will be able to apply fundamental thermodynamic and energy transfer principles to the solution of practical mechanical engineering technology problems.

COURSE ASSESSMENT CRITERIA:

Outcome 3 “The ability to apply creative technical skills to the analysis and design of mechanical components and systems.”

Outcome 8 “Knowledge of heat energy transfer concepts essential to the analysis and design of machines and machine systems.”

Outcome 11 “Effective team work skills”

Outcome 14 “Fundamental knowledge of instrumentation used to measure parameters in fluid mechanics, heat transfer, and mechanical vibrations.”

TOPICAL OUTLINE

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| Week 1 | Basic Concepts of Thermodynamics |
| Week 2 | Properties of Pure Substances |
| Week 3 | Properties of Pure Substances |
| Week 4 | First Law of Thermodynamics: Closed Systems |
| Week 5 | First Law of Thermodynamics: Control Volumes |
| Week 6 | First Law of Thermodynamics: Control Volumes |
| Week 7 | Second Law of Thermodynamics |
| Week 8 | Mid-term Test |
| Week 9 | Second Law of Thermodynamics |
| Week 10 | Entropy |
| Week 11 | Entropy |
| Week 12 | Thermodynamic Cycles |
| Week 13 | Thermodynamic Cycles |
| Week 14 | Thermodynamic Cycles |
| Week 15 | Review |
| Week 16 | Final Exam |

TEXT MATERIAL

Introduction to Thermodynamics and Heat Transfer, 1st Edition,
Yunus A. Cengel, McGraw Hill

PREREQUISITES BY TOPIC

Basic concepts of work and energy, fundamental engineering technology problem solving, simple differentiation and integration, basic computer programming skills.

COMPUTER USAGE

Spread Sheet, Word Processing

METHOD OF PRESENTATION

Lecture and recitation/problem solving.

METHOD OF EVALUATION

The student will be evaluated on class participation, homework grades and performance on quizzes and final exam.

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| Project Portfolio | 30% |
| Test 1 | 35% |
| Test 2 | 35% |

Miami University Learning Community:

Miami University is committed to fostering a supportive learning environment for all students irrespective of individual differences in gender, race, national origin, religion, handicapping conditions, sexual preferences, or age. Students should expect, and help create, a learning environment free from all prejudice. Disparaging comments, sexist or racist humor, or questioning the academic commitment of students based upon these individual differences are behaviors that undermine our learning community. If such behaviors occur in class, please seek the assistance of your instructor or department chair.

Revised 04/10/08
Ron Earley