Course: ME 30100 – Thermodynamics II

Type of Course: Required for ME program

Catalog Description: Reversibility, availability, power cycles, and the conversion of heat into work; combustion, heat pumps, refrigeration, and air conditioning.

Credits: 3

Contact Hours: 3

Prerequisite Courses: ME 20000

Corequisite Courses: None

Prerequisites by Topics: Thermodynamics I


Course Objectives: To introduce the concepts of exergy and irreversibility and to apply the first and second law of thermodynamics to power and refrigeration cycles and to mixtures of ideal gases and reacting systems.

Course Outcomes: Students who successfully complete this course will have demonstrated an ability to:

1. Understand the concepts of exergy and irreversibility. (1)
2. Analyze power producing cycles. (1)
3. Analyze refrigeration and heat pump cycles. (1)
4. Apply the first and second law of thermodynamics to gas mixtures. (1)
5. Analyze psychrometric systems. (1)
6. Analyze combustion process by applying mass and energy balances. (1)
7. Design a thermodynamic system and report the results. (2,3)

Lecture Topics:

1. Review of thermodynamics
2.Availability and irreversibility
3. Vapor power cycles
4. Gas power cycles
5. Refrigeration cycles
6. Mixtures of ideal gases
7. Psychometrics
8. Combustion

Computer Usage
Low

Laboratory Experience
None

Design Experience
Medium

Coordinator
Donald Mueller, Ph.D., P.E.

Date
27 June 2018