University of Arkansas - Fort Smith
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General Syllabus

MEEG 24003 Thermodynamics

Credit Hours: 3 Lecture Hours: 3 Laboratory Hours: 0

Prerequisite: MATH 24004 Calculus I and PHYS 20303 University Physics I

Effective Catalog: 2018-2019

I. Course Information

A. Catalog Description

A study of the first and second laws of thermodynamics, including availability of energy; properties of liquids, gases and vapors; and non-flow and flow processes.

B. Additional Information

This course is a requirement for mechanical engineering majors. The course may also be taken by electrical engineering and mathematics majors for elective credit.

II. Student Learning Outcomes

A. Subject Matter

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

1. Determine the state of a substance and find relevant thermodynamic properties from charts and tables.
2. Apply the first law of thermodynamics to open and closed systems.
3. Apply the second law of thermodynamics to energy systems.
4. Design energy systems for specific applications.
5. Analyze heating, refrigeration and power cycles using the first and second laws of thermodynamics.
6. Apply psychometric equations to simple idealized systems.

B. University Learning Outcomes

MEEG 24003 Thermodynamics enhances student abilities in the following areas:

Communication Skills (written and oral)

Students will give written and oral presentations related to an engineering design project. Students will present their homework to the class.

Analytical Skills

Critical Thinking Skills - Students will analyze thermodynamic systems and cycles, solving for work and efficiency. Students will evaluate the effectiveness of a particular device through comparison with actual physical devices.

Quantitative Reasoning - Students will apply thermodynamic equations and charts to find system properties. Students will create graphical models for thermodynamic systems and processes.

III. Major Course Topics

A. Course topics include: substance properties
B. First law of thermodynamics
C. Second law of thermodynamics
D. Power cycles
E. Refrigeration cycles,
F. Psychometrics.