

Master Syllabus

MET 2101 - Thermodynamics

Division: Science, Mathematics and Engineering

Department: Mechanical Engineering Technology

Credit Hour Total: 3.0

Lecture Hrs: 2.0 **Lab Hrs:** 2.0

Prerequisite(s): PHY 1141OR PHY 2201AND MET 2201OR MEE 2101

Date Revised: January 2015

Course Description:

The laws and application of the principles of thermodynamics as they apply to internal combustion engines, steam cycles and refrigeration. Two classroom, two lab hours per week.

General Education Outcomes:

- Critical Thinking/Problem Solving Competency
- Information Literacy Competency

Course Outcomes:

Power cycle analysis

Analyze the Otto, Diesel, Rankine power cycles.

Assessment Method: Locally developed exams

Performance Criteria:

70% or higher correct score on exams

Properties of ideal gas mixtures

Use the ideal gas law to determine the properties and characteristics of a mixture of ideal gasses.

Assessment Method: Locally developed exams

Performance Criteria:

70% or higher correct score on exams

Psychrometric analysis

Apply basic equations of state to determine the thermodynamic properties of moist air. Plot these properties on a psychrometric chart and perform a graphic analysis of a psychrometric process.

Assessment Method: Locally developed exams

Performance Criteria:

70% or higher correct score on exams

Refrigeration cycle analysis

Analyze a single-stage refrigeration cycle.

Assessment Method: Locally developed exams

Performance Criteria:

70% or higher correct score on exams

Thermodynamic analysis based on the first and second laws

Apply the concepts of conservation of energy, reversible vs. irreversible systems (entropy), and thermal efficiency to analyze energy transfers.

Assessment Method: Locally developed exams

Performance Criteria:

70% or higher correct score on exams

Outline:

Thermodynamic laws and concepts

Thermodynamic properties

Internal combustion engines

Steam cycles

Refrigeration

Mixtures