NorthWest Arkansas Community College
Division of Science and Mathematics

Course Number and Title
MEEGH 2403: Thermodynamics

Catalog Description
The course is intended for potential engineering students in the second year of study. It is the study of the 1st and 2nd laws of thermodynamics. Availability of energy, properties of liquids, gases, and vapors; nonflow and flow processes.

Prerequisites
PHYS 2054 and MATH 2564

Credit hours/Contact hours/Load hours
3 credit hours/ 4 contact hours/ 4 load hours

Target Audience/Transferability
This course is designed for students who are transferring into an engineering program at a 4-year institution. It is intended to transfer in as a 3 credit hour Intro course for those engineering areas requiring such a course. Transferability, as always, depends on the policy of the senior institution.

Student Learning Outcomes
Students successfully completing this course will possess an understanding of fundamental engineering concepts and will:

1. Develop an understanding of laws of thermodynamics.
2. Describe physical properties of pure substances,
3. Apply problem solving techniques to problems in thermodynamics,
4. Understand the concept of energy transformation and its relationship to the variables in thermodynamics.
5. Understand the concept of entropy,
6. Understand power cycles
7. Understand the concept of efficiency in relation to heat engines
8. Describe the properties of gas mixtures
9. Describe the properties of gas mixtures

Topics
1) Introduction and Basic Concepts
2) Energy Conversion and General Energy Analysis
3) Properties of Pure Substances
4) Energy Analysis of Closed Systems
5) Mass and Energy Analysis of Control Volumes
6) The Second Law of Thermodynamics

7) Entropy
8) Energy: A Measure of Work Potential
9) Gas Power Cycles
10) Vapor and Combined Power Cycles
11) Refrigeration Cycles
12) Thermodynamic Property Relations
13) Gas Mixtures
14) Gas Vapor Mixtures and Air-Conditioning
15) Chemical Reactions
16) Chemical and Phase Equilibrium
17) Compressible Flow