NVCC COLLEGE-WIDE COURSE CONTENT SUMMARY

MEC 255 - THERMODYNAMICS (3 CR.)

COURSE DESCRIPTION

Studies the properties of fluids and basic principles of work, energy, and heat. Includes the first and second laws of thermodynamics, processes and cycles, thermal reversibilities and irreversibilities, internal combustion engines, and gas turbines. Lecture 3 hours per week.

GENERAL COURSE PURPOSE

This course will provide the student a basic understanding of fluid systems and the ability to analyze fluid systems to determine pump/power requirements and efficiencies.

ENTRY LEVEL COMPETENCIES

Proficiency in solving multi-variable algebraic expressions, engineering static's problems, and using dimensional analysis. Prerequisite is MTH 115 and demonstrated proficiency in logarithmic functions. MEC 295 must be taken concurrently.

COURSE OBJECTIVES

The student will be able to solve basic thermodynamics and fluid mechanics problems and analyze simple fluid systems to determine pump/power requirements and efficiencies.

MAJOR TOPICS TO BE INCLUDED

A. Fluid Statics
B. Fluid Dynamics (Bernoulli's Equation)
C. Temperature and Thermal Expansion
D. Heat Energy and Phase Change
E. Ideal Gas Law and Kinetic Theory
F. 0th, 1st, 2nd, 3rd, Laws of Thermodynamics
G. Steady Flow Energy Equation
H. Non-Flow Energy Equation
I. Reversible Non-Flow Processes
J. Carnot, Otto, and Diesel Engines
K. Brayton Cycle
L. Reverse Heat Engines
M. Incompressible Fluid Flow
N. Pumps and Pumping Power
O. Heat Exchangers
P. Fluid Systems Analysis(General Energy Equation)
Q. Losses in Fluid Systems