1. Course number and name: EGN 3343 Engineering Thermodynamics

2. Credits and contact hours: 3 credits / Three 50 minute lectures each week

3. Instructor’s or course coordinator’s name: Dr. O. Curet


5. Specific course information:
   (a) Brief description of the content of the course (catalog description): The course deals with properties of a simple pure compressible substance, equations of state, the first law of thermodynamics, internal energy, specific heats, enthalpy and the application of the first law to a system or a control volume. The study of the second law of thermodynamics is also discussed leading to the discovery of entropy as a property and its ramifications.
   
   (b) Prerequisites: PHY2043 Physics for Engineers I (a grade of C or above)
   
   (c) Co-requisites: MAC2313 Calculus and Analytical Geometry III
   
   (d) indicate whether a required, elective, or selected elective course in the program: Required

6. Specific goals for the course:
   (a) Specific outcomes of instruction (course specific objective): The objective of the course is to provide the students with a fundamental understanding of the basics of the science of energy conversion and prepare the student to evaluate the relative merits of different thermodynamic systems.
   
   (b) Explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course. The learning outcomes of the course (and related ABET Criterion 3) outcomes are:
   1. Students will have learned that energy is conserved based on the first law of thermodynamics. (a,e,k)
   2. Students will have learned whether or not a process is possible based on the second law of thermodynamics. (a,e,k)
   3. Students will be able to apply thermodynamic analysis to a system or a control volume. (a,e,k)

7. Brief list of topics to be covered:
   - Definitions, terminology, properties of systems, pressure, temperature scale, heat and work as path dependent functions, zeroth law of thermodynamics, concept of a thermodynamic equilibrium, different kinds of work.
   - The first law of thermodynamics, and its application to systems.
   - Properties of a pure compressible substance, Phases and their transitions, p-V-T relation for gaseous medium, specific heats.
   - Application of the first law to a control volume: energy relationship for flow processes.
   - Transient flow processes.
   - Cycles of heat engines, different kinds of processes, thermal efficiency of heat engines.
   - The second law of thermodynamics, Corollaries of the second law of thermodynamics, reversible processes and irreversible processes.
   - Entropy and entropy production.
   - Entropy rate balance for a control volume.
   - Example of a power generation system.