Course Syllabi

1. CCFF-00033 THERMODYNAMICS
2. 144 credits hours.
3. Bibliography
   - Termodinámica, Rolle, Kurt C, 2006
   - Thermodynamics: an engineering approach, Cengel, Yunes A, 2012
4. Specific Course Information
   a. Thermodynamics, which can be defined as the science of energy, is an essential part of the integral formation of the Industrial Engineer. Industrial processes demand the application of the Principles of Thermodynamics for the realization of an energetic analysis of the different types of systems. Knowledge of whether a thermodynamic process can occur or not is essential for the design of new processes, as well as knowledge of the maximum performances that can be obtained in the The study of the thermodynamic properties of the working fluids that circulate through the devices is indispensable to analyze the behavior of the thermal systems. The subject provides in the ABET indicators as detailed below: RA1. Troubleshooting and RA5. Teamwork.
   b. Corequisites:
      • MAES-00087 DIFFERENTIAL EQUATIONS
   c. Prerequisites:
      • CCFF-00029 PHYSICS I
      • CCFF-00031 ORGANIC CHEMISTRY
5. Learning Objectives of the Course
   a. Apply the laws of Thermodynamics, by studying the interactions between matter and the different forms of energy, in solving problems in the industrial sphere.
      - To acquire general knowledge about the macroscopic vision of Thermodynamics and its application in industrial processes.
      - To identify, define and calculate the thermodynamic properties of a system.
      - To use the laws of Thermodynamics to perform energy balances.
   b. Learning Outcomes
      - Analyze the concepts and nature of energy, heat, work, enthalpy, entropy and exergy to develop balances and quantify effects. ra1
      - Related theoretical knowledge to the practical applications of thermodynamics. ra1 and ra5
      - Use general knowledge of thermodynamics and understand its application in industrial processes. ra1
      - Analyze the concepts and nature of energy, heat, work, enthalpy, entropy and exergy to develop balances and quantify effects. ra1
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      - Use general knowledge of thermodynamics and understand its application in industrial processes. ra1
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6. Course Topics

- Basic concepts and definitions
- The first thermodynamic law
- Properties of a pure, simple, compressible substance
- Ideal and state models of ideal gas
- Energy analysis of control volumes
- The second law of the thermodynamic
- Enterropia
- Exergy and irreversibility
- Refrigeration systems 12 generalized thermodynamic relationships 13mecles of gas 14mecles of gas-vapor