1. Course: ENCP 290 Thermodynamic Fundamentals
2. Credits and Contact Hours: 3 credits, 3 lecture hours per week
3. Instructor: Varies
4. Example Textbook: M. J. Morgan, H. N. Shapiro, D. Boettner, M. B. Bailey, “Fundamentals of Engineering Thermodynamics”, 9th Ed., John Wiley & Sons; ISBN: 978-1-119-39147-0
5. Course Information
   1. Catalog Description: Definitions, work, heat, and energy. First law analyses of systems and control volumes. Second law analysis.
   2. Prerequisite: MATH 241 Vector Calculus.
   3. Substitute for ECHE 310 or EMCH 290
6. Course Goals
   1. Learning Outcomes. Students will be able to:
      1. Students will determine the thermodynamic properties of simple compressible substances from tabular data and equations of state.
      2. Students will implement the concepts of conservation of mass, conservation of energy and the second law of thermodynamics.
      3. Students will apply concepts of irreversibility, isentropic efficiencies and their implementation in solving thermodynamic problems.
      4. Students will demonstrate the ability to analyze thermodynamic power and refrigeration cycles.
   2. Learning Outcomes (LOs) relation to ABET EAC Criterion 3 Student Outcomes

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| ABET EAC Criterion 3 Student Outcomes | LO1 | LO2 | L03 | L04 |
| an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics. | X | X | X | X |

1. Topics Covered
   1. Definitions
   2. Energy and the First Law of Thermodynamics
   3. Evaluating Properties
   4. Control Volume Analysis Using Energy
   5. Second Law of Thermodynamics
   6. Using Entropy
2. Document History

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