

**MECHANICAL ENGINEERING PROGRAM**  
**ABET COURSE SYLLABUS**

**ME 303 Thermodynamics II (3 Units) Required**

**Course Description:** (2013-15 Catalog) Vapor and gas power cycles, refrigeration cycles, thermodynamic relations, psychrometrics, and chemical reactions. 3 lectures.

**Prerequisite Courses:** ME 302

**Prerequisites by Topic:** Thermodynamics I

**Textbook:** (and/or other required material) Fundamentals of Engineering Thermodynamics, 7th Edition by Moran Shapiro, Boettner, and Bailey, John Wiley & Sons, 2011.

**References:** None

**Course Coordinator/Instructor:** Andrew Kean, Associate Professor of ME

**Course Learning Outcomes:** Building on the outcomes of ME 302, the overall objective of this course is to enrich/deepen the student's ability to analytically solve engineering problems involving work, heat transfer, and energy. Students will synthesize their thermodynamics knowledge and apply it to systems of greater complexity. Students will evaluate and assess the performance of vapor and gas power systems and refrigeration systems. Thermodynamic properties of gas mixtures will be evaluated, and students will be able to explain the application of thermodynamic laws to reacting mixtures.

| <b>Relationship of Course to MECHANICAL ENGINEERING Program Outcomes:</b> |          |          |          |          |          |          |          |          |          |          |          |          |
|---|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| <i>a</i>  | <i>b</i> | <i>c</i> | <i>d</i> | <i>e</i> | <i>f</i> | <i>g</i> | <i>h</i> | <i>i</i> | <i>j</i> | <i>k</i> | <i>l</i> | <i>m</i> |
| <b>H</b>  | <b>L</b> | <b>L</b> | <b>L</b> | <b>H</b> | <b>M</b> | <b>M</b> | <b>H</b> | <b>M</b> | <b>M</b> | <b>H</b> | <b>H</b> | <b>H</b> |

**Topics Covered:** Exergy  
Vapor power systems  
Gas power systems  
Refrigeration systems  
Ideal gas mixtures  
Air-water vapor mixtures (psychrometrics)  
Combustion fundamentals including adiabatic flame temperature

**Laboratory Projects:** None

**Class/Lab Schedule:**

Three 50-minute classes per week.

**Contribution of Course to Meeting the Professional Component:**

|   |                 |
|---|-----------------|
| (a) College-level mathematics and basic sciences: | 0 credits       |
| (b) Engineering Topics:<br>Design?                | 3 credits<br>No |
| (c) General Education:                            | 0 credits       |
| (d) Other:  | 0 credits       |

**Prepared by:** Andrew Kean**Date:** 09/11/13

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