

Course	ME 30100 – Thermodynamics II
Type of Course	Required for ME program
Catalog Description	Reversibility, availability, power cycles, and the conversion of heat into work; combustion, heat pumps, refrigeration, and air conditioning.
Credits	3
Contact Hours	3
Prerequisite Courses	ME 20000 with a minimum grade of C-
Corequisite Courses	None
Prerequisites by Topics	Thermodynamics I
Textbook	Borgnakke and Sonntag, <i>Fundamentals of Thermodynamics</i> , Wiley, current edition.
Course Objectives	To introduce the concepts of exergy and irreversibility and to apply the first and second law of thermodynamics to power and refrigeration cycles and to mixtures of ideal gases and reacting systems.
Course Outcomes	<p>Students who successfully complete this course will have demonstrated an ability to:</p> <ol style="list-style-type: none">1. Understand the concepts of exergy and irreversibility. (1)2. Analyze power producing cycles. (1)3. Analyze refrigeration and heat pump cycles. (1)4. Apply the first and second law of thermodynamics to gas mixtures. (1)5. Analyze psychrometric systems. (1)6. Analyze combustion process by applying mass and energy balances. (1)7. Design a thermodynamic system and report the results. (2,3)
Lecture Topics	<ol style="list-style-type: none">1. Review of thermodynamics2. Availability and irreversibility3. Vapor power cycles4. Gas power cycles

5. Refrigeration cycles
6. Mixtures of ideal gases
7. Psychometrics
8. Combustion

Computer Usage	Low
Laboratory Experience	None
Design Experience	Medium
Coordinator	Donald Mueller, Ph.D., P.E.
Date	12 October 2022