

School of Management, Engineering and Technology  
Department of Electrical Engineering and Renewable Energy  
ENGR 355: Thermodynamics

Catalogue Description (2009/2010):	An introductory course in thermodynamics, the science of heat energy conversion. Develops understanding of energy, heat, work, efficiency, and ideal thermodynamic cycles. Teaches first and second laws of thermodynamics and perfect gas law.		
Hours/Credits: (Lecture-Lab-Total)	(3-0-3)		
Class Schedule:	Twice weekly 75 minute lectures		
Prerequisites:	MATH 252; PHY 202 or PHY 222		
Required Text:	Moran, M.J., Shapiro, H.N., "Fundamentals of Thermodynamics," 6th Ed., Wiley		
Reference Text:	Cengel, Y.A., Boles, M.A., "Thermodynamics: An Engineering Approach," 6th Ed., McGraw-Hill  Borgnakke, C., Sonntag, R.E., "Fundamentals of Thermodynamics," 7th Ed.  "Fundamentals of Engineering Supplied-Reference Handbook," National Council of Examiners for Engineering and Surveying (NCEES), 8th Ed., 2008		
Course Coordinator:	Robert Bass, Ph.D.		
Regular Instructors:	Robert Bass, Tom White		
Course Objectives:	<p>The goals of this course are to:</p> <ul style="list-style-type: none"> <li>• develop students' ability to analyze problems in engineering thermodynamics in a simple, logical and systematic manner by applying fundamental principles to their solution.</li> <li>• expose student to various aspects of thermodynamic engineering through lecture, class presentation and problem solving.</li> <li>• develop the students' process of reasoning in the solution of complex problems through the use of schematic diagrams, cycle diagrams, and thermodynamic tables.</li> </ul>		
Topics Covered:	<ul style="list-style-type: none"> <li>• General Energy Analysis and the 1st Law of Thermodynamics</li> <li>• Evaluating Properties of Pure Substances</li> <li>• Control Volume Analysis</li> <li>• The Second Law of Thermodynamics</li> <li>• Entropy</li> <li>• Exergy Analysis</li> </ul>		
Relevant Program Outcomes:	(a) an ability to apply knowledge of mathematics, science, and engineering (e) an ability to identify, formulate, and solve engineering problems (g) an ability to communicate effectively (k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice (l) an ability to apply the fundamentals of energy conversion and applications		
Required or Elective:	Required		
Criterion 5:	Engineering Topics		
Prepared By:	Robert Bass, Ph.D.	Updated:	April 26, 2010