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Department of Mechanical Engineering	
Thermodynamics I (67220)	
Total Credits	**3**
major compulsory	
Prerequisites	P1 : General Physics I (22101) P2 : General Chemistry I (23101)

Course Contents

Properties and behavior of a pure substance. First law and second law analysis applied to different system and control volumes, availability and irreversibility.

	Intended Learning Outcomes (ILO's)	Student Outcomes (SO's)	Contribution
1	Illustrate the 4 basic laws of thermodynamics, learn about thermodynamic systems and boundaries, and understand the basic concepts of thermodynamic properties	A	20 %
2	Apply the basic concepts of work and energy transfer by heat (first law of thermodynamics) for closed and open systems.	A	50 %
3	Identify the second law of thermodynamics for different thermodynamic processes	E	20 %
4	Recognize the basics of irreversibility and availability in thermodynamics	E	10 %

Textbook and/ or Refrences

Textbook: 1. G. J. Vanwylen, R. E. Sonntag and C. B. Rgnakke, "Fundamental of classical Thermodynamics", John Wiley &Sons, 2004. References: 2. M. C. potter &E. P. Sott, Thermal Sciences, 4th Edition.John Wiley &Sons 2000. 3. H. C. Van Nerss, Understanding thermodynamics, 4th edition. John Wiley &Sons 1998. 4. M. J. Moran &H. N. Shapiro Fundamentals of Engineering Thermodynamics , 4th Edition. 2000. 5. Y. A. Cengel &M. A. Boles, Thermodynamics, 5Th Edition 2000. 6. R. E. Sonntag &C. Borgnakke, Introduction to Engineering Thermodynamics , 3rd 2001.

Assessment Criteria	Percent (%)
First Exam	20 %
Second Exam	20 %
Quizzes	10 %
Final Exam	50 %

Course Plan

Week	Topic
1-2	Introduction Basic Concepts Properties (Pressure, Temperature, and Specific Volume)
3-6	First Law Energy, Work, Heat Energy Analysis for Closed Systems Energy Analysis for a Control Volume
6	First Exam
7-10	Second Law Entropy Exergy (Availability)
10	Second Exam
11-15	Power Systems Vapor Power Systems Gas Power Systems
16	Final Exam