

**King Saud University**  
**Mechanical Engineering Department**  
**ME 371 Thermodynamics -I-**

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**Course Description:**

Thermodynamics I is a fundamental course that serves as the background for many courses in thermal fluid sciences. The main topics covered are: basics concepts and definitions, energy transfer, first law of thermodynamics, second law of thermodynamics, Carnot and reversed Carnot cycles, and entropy

**Textbook:** Thermodynamics: An Engineering Approach, by Cengel and Boles

**Course Content**

Chapter		Sections	Suggested Exercise Problems (8 <sup>th</sup> Edition)	Suggested Exercise Problems (9 <sup>th</sup> Edition)
1	Introduction and Basic Concepts	1-1 to 1-8 1-9 (except Variation of Pressure with Depth)	1-4C, 1-13, 1-17C, 1-35, 1-43, N/A	1-3C, 1-15, 1-19C, 1-36, 1-47, 1-51E
2	Energy, Energy Transfer, and General Energy Analysis	2-1 2-2 (except Mechanical Energy) 2-3 to 2-8	N/A, N/A, 2-18C, N/A, N/A, 2-35C, 2-40, 2-53	2-11, 2-14, N/A, 2-29E, 2-31, 2-39C, N/A, 2-58
3	Properties of Pure Substances	All sections	3-20, 3-27, 3-47, N/A, 3-70, 3-71, 3-76	3-21, 3-30, 3-50, 3-57, 3-75, 3-78, 3-84
4	Energy Analysis of Closed Systems	All sections	4-3, 4-5, 4-8, 4-20, 4-29, 4-32, 4-61, 4-68, 4-76	4-7, 4-8, 4-11, 4-22, 4-33, 4-38, 4-64, 4-74, 4-85
5	Mass and Energy Analysis of Control Volumes	5-1 to 5-4	5-8, 5-10, 5-20, 5-31, 5-43, 5-54, 5-59, 5-77, 5-99	5-11, 5-13, 5-22, 5-32, 5-48, 5-56, 5-62, 5-81, 5-107
6	The Second Law of Thermodynamics	All sections	6-18, 6-21, N/A, 6-43, 6-52, 6-75, 6-89, 6-97	6-19, 6-22, 6-46, 6-50, 6-57, 6-85, 6-100, 6-107
7	Entropy	All sections except 7-11	7-20, 7-23, 7-26, 7-57, 7-74, 7-80, 7-92, 7-102, 7-111, 7-118, 7-145	7-19, 7-21, 7-25, 7-67, 7-80, 7-84, 7-91, 7-107, 7-119, 7-125, 7-154

**Assessment Tools:**

Quizzes: <b>10%</b>	Presentation on General Topic: <b>5%</b>
Classwork: <b>5%</b>	Report on Extended Numerical Problem: <b>10%</b>
2 Midterm Exams: <b>30%</b>	Final Exam: <b>40%</b>

**Midterm exam dates will be determined by the College administration**