



Course Syllabus: Thermodynamics - ME 241

Division	Physical Science and Engineering Division
Course Number	ME 241
Course Title	Thermodynamics
Academic Semester	Spring
Academic Year	2017/2018
Semester Start Date	01/28/2018
Semester End Date	05/24/2018
Class Schedule (Days & Time)	01:00 PM - 02:30 PM Mon Wed

Instructor(s)				
Name	Email	Phone	Office Location	Office Hours
Deanna Angele Monique Lacoste	deanna.lacoste@kaust.edu.sa	+966128084801	4336, 5, Al-Kindi (bldg. 5)	Available to students anytime I'm in my office, or email for an appointment.

Teaching Assistant(s)	
Name	Email

Course Information	
Comprehensive Course Description	Fundamentals of classical and statistical thermodynamics. Basic postulates, thermodynamic potentials, chemical and phase equilibrium, phase transitions, and thermodynamic properties of solids, liquids and gases, combustion, basic concepts of statistical thermodynamics, classical and quantum statistics, classical statistical treatment of an ideal gas, heat capacity of diatomic gas.
Course Description from Program Guide	Fundamentals of classical and statistical thermodynamics. Basic postulates, thermodynamic potentials, chemical and phase equilibrium, phase transitions, and thermodynamic properties of solids, liquids, and gases.
Goals and Objectives	The goal of the course is to provide the students with the main concepts of classical and statistical thermodynamics.
Required Knowledge	Undergraduate level of Thermodynamics, or ME101. Undergraduate calculus.
Reference Texts	"Classical and Statistical thermodynamics", by A.H. Carter "Thermodynamics foundations and applications", by E.P. Gyftopoulos & G.P. Beretta
Method of evaluation	40.00% - Final exam 20.00% - Quiz(zes) 40.00% - Midterm exam
Nature of the assignments	There are three components to the final grade: 4 quizzes, the midterm exam and the final exam. The 4 quizzes (20% in total of the grade) have a duration of 20 min. The midterm and final exams (each 40% in total of the grade) have a duration of 90 min. Quizzes and exams are closed book and closed notes.
Course Policies	The students are required to attend all the lectures and to take notes. Students that do not show up for a quiz or an exam should expect zero in that assessment. The students may use a calculator.

Tentative Course Schedule*(Time, topic/emphasis & resources)*

Week	Lectures	Topic
1	Mon 01/29/2018	Course Introduction. Summary of basic concepts.
1	Wed 01/31/2018	Heat engines.
2	Mon 02/05/2018	Systems with volume as the only parameter.
2	Wed 02/07/2018	Simple systems.
3	Mon 02/12/2018	Phase rule.
3	Wed 02/14/2018	Quiz 1. Thermophysical properties of pure substances.
4	Mon 02/19/2018	Ideal gases, liquids and solids.
4	Wed 02/21/2018	Equations of state.
5	Mon 02/26/2018	Bulk flow.
5	Wed 02/28/2018	Conversion devices.
6	Mon 03/05/2018	Availability functions.
6	Wed 03/07/2018	Quiz 2. Energy conversion systems.
7	Mon 03/12/2018	Thermophysical properties of mixtures.
7	Wed 03/14/2018	Ideal-gas mixtures and solutions.
8	Mon 03/19/2018	Nonideal mixtures.
8	Wed 03/21/2018	Problem review.
9	Mon 03/26/2018	Problem review.
9	Wed 03/28/2018	Midterm exam.
10	Mon 04/02/2018	No classes.
10	Wed 04/04/2018	No Classes.
11	Mon 04/09/2018	Chemical Reactions.
11	Wed 04/11/2018	Chemical equilibrium.
12	Mon 04/16/2018	Combustion.
12	Wed 04/18/2018	Quiz 3. Introduction to Statistical thermodynamics.
13	Mon 04/23/2018	Quantum states.
13	Wed 04/25/2018	Classical and quantum statistics.
14	Mon 04/30/2018	Connection between classical and statistical thermodynamics.
14	Wed 05/02/2018	Quiz 4. Classical statistical treatment of an ideal gas.
15	Mon 05/07/2018	Classical statistical treatment of an ideal gas 2.
15	Wed 05/09/2018	Heat capacity of a diatomic gas.
16	Mon 05/14/2018	Heat capacity of diatomic gas 2.
16	Wed 05/16/2018	Problem review.
17	Mon 05/21/2018	Problem review.
17	Wed 05/23/2018	Final exam.

Note

The instructor reserves the right to make changes to this syllabus as necessary.