



Advanced Chemical Engineering Thermodynamics

The University of Toledo
Chemical and Environmental Engineering
CHEE 6510/8510

Instructor:	Maria Coleman	Class Location:	Palmer 2450
Email:	maria.coleman6@utoledo.ed	Class Day/Time:	MW 9:30 am-10:45 am
Office Hours:	TTh 1-2:00, MW 1-2:00	Lab Location:	NA
Office Location:	NE 2470	Lab Day/Time:	NA
Office Phone:	419-530-8091	Credit Hours:	3
Term:	Fall 2015		

COURSE/CATALOG DESCRIPTION

This course teaches concepts of thermodynamics with emphasis on application to chemical systems. Students will learn how to formulate and solve engineering problems involving energy flow and phase/reaction equilibrium. Advanced topics such as intermolecular potentials, thermodynamics of electrolyte solutions and introduction statistical mechanics will also be surveyed.

STUDENT LEARNING OUTCOMES

The students will be able to use set up and solve problems in thermodynamics with emphasis on phase equilibria. **The following table lists topics to be covered and specific locations in Sandler's Text.**

Conservation of Mass and Energy (Chp 1 to 3.1)
Application of First Law (Chp 3.2 to 3.5)
Entropy, Reversible Processes, Second Law and Application (Chp. 4.1-4.5)
Convenience functions, Equations of State, Third Law (Chp. 6.1-6.9)
Phase Behavior of Pure Materials (Chp. 7)
Solution thermodynamics and Partial Molar Properties (Chp. 8.1-6)
Equilibrium Criteria for Multicomponent Mixtures (Chp. 8.7-8.10)
Excess Properties and Activity Coefficient Models (Chp. 9.1 -9.7)
Vapour Liquid Equilibrium (Chp 10)
Liquid-Liquid Equilibrium, Osmotic Effects, Solid Liquid Equilibrium (Chp. 11, 12.1-12.3)

TEACHING STRATEGIES

The course consists of two primary lecture periods in which a new concepts will be introduced and example problems will be solved during course time.

PREREQUISITES AND COREQUISITES

NA



REQUIRED TEXTS AND ANCILLARY MATERIALS

S.I. Sandler; Chemical, Biochemical and Engineering Thermodynamics; John Wiley & sons, 4th edition

TECHNOLOGY REQUIREMENTS

Software - Excel, Matlab or PolyMath

UNIVERSITY POLICIES

The University is an equal opportunity educational institution. Please read [The University's Policy Statement on Nondiscrimination on the Basis of Disability Americans with Disability Act Compliance.](#))

Academic Accommodations

The University of Toledo is committed to providing equal access to education for all students. If you have a documented disability or you believe you have a disability and would like information regarding academic accommodations/adjustments in this course please contact the [Student Disability Services Office.](#)

ACADEMIC POLICIES

The rules of academic dishonesty as described in the University of Toledo General Catalogue will apply to this course. If you are found cheating on an examination, you can be assigned an F in the course. If you are unsure about what constitutes academic dishonesty, consult me.

COURSE EXPECTATIONS

While homework assignments are not mandatory for this course, suggested problems will be assigned and solutions posted on blackboard. All exams missed without prior notice cannot be made up and will be considered a zero. Exceptions will be made for emergencies to be discussed with the professor.

GRADING

Grading:

Exam 1	30 %
Exam 2	30 %
Final exam	40 %

Grade Scale:	90-100	A
	80-89	B
	70-79	C
	60-69	D
	Below 60	F