

# Thermodynamics: Chemical Equilibria

CHE 3300 - Fall 2004

Department of Chemical Engineering and Materials Science  
Wayne State University

**Lecture:** 6:00-7:50pm , M W, Room 0128 Mano

**Instructor:** Jeffrey Potoff, PhD, Assistant Professor

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**Web site:** <http://www.blackboard.wayne.edu>

**Office Hours:** By appointment

**Prerequisites:** CHE 2800, MAT 2020

**Textbook:** Elliott, J. R. and Lira, C. T., "Introductory Chemical Engineering Thermodynamics," Prentice-Hall (1999).

**Objectives:** In this course, students will:

1. Apply the first and second laws of thermodynamics to calculate heat and work interactions in closed, open, steady and unsteady state processes.
2. Learn how the thermodynamic variables  $U, H, G, A, S, P, V$  and  $T$  are related and use be able to use "thermodynamic math" to express them in terms of experimentally measurable quantities.
3. Use equations of state to determine the  $PVT$  behavior, enthalpy and entropy of real fluids.
4. Predict multi-component phase equilibria of non-ideal systems utilizing fugacity and activity coefficient models as well as group-contribution methods, such as UNIFAC.
5. Determine heat interactions in multi-component, multi-phase reacting systems.

<b>Grading:</b>	Homework	10%
	Class participation and quizzes	5%
	Exam #1 (First and second laws of thermodynamics)	15%
	Exam #2 (Generalized analysis of fluid properties)	20%
	Exam #3 (Phase equilibria in mixtures)	20%
	Final Exam (comprehensive)	30%

**Scale:** A: 100-85%, B: 84-70%, C: 69-55%, D: 54-35%

**FINAL GRADES ARE NOT CURVED!**

Exams are *tentatively* scheduled for **October 6, November 10,**  
and **December 15.**

**Final Exam:** Monday, December 20, 6:00-7:50pm

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- Homework:** All homework is assigned on the first day of class. Students may turn in homework any time before the due date to receive full credit. Homework solutions that are turned in early (minimum of 24 hours before the due date) and have scores above 75% will receive a bonus of 10%. Students should make copies of their homework to ensure they have it to study for exams. **Instructor reserves the right to alter the homework assignments via a one-week advance notice.**
- Add/Drop:** As per College of Engineering policy, no drop forms will be signed after October 13, 2004. Failing the course is not a valid reason for withdrawal.
- Missed Exams:** Students who must miss an exam for any reason are expected to contact the course instructor before the date of the exam. Valid excuses for missing an exam are: illness, car crash, death in the immediate family, and jury duty. Students must provide documentation (doctor's note, police report, death certificate, etc), before make-up examinations will be administered.
- Attendance:** Students are expected to attend all classes. Missed classes will result in a reduced "Class Participation" grade. Rain, snow, etc. are not valid excuses for missing class if the university is open.
- Cheating:** Students caught cheating on any assignment will receive a grade of 0 on that assignment and be subject to disciplinary action.