

## ChEE 506    Advanced ChE Thermodynamics

### Thermodynamics

1. First & second law: work, heat, entropy, reversible and irreversible paths
2. Chemical potential: Chps. 14, 15
3. Fugacity and activities: Chps. 16, 22
4. Multicomponent phase equilibria: Chps. 23-26
5. Electrolyte solutions: Chp. 27
6. Galvanic and Electrochemical Systems: Chps. 28, 29

### Statistical Mechanics

1. Ensembles and partition functions
2. Probabilities and populations
3. Statistical derivation of thermodynamic functions
4. Boltzmann Statistics
5. Partition function of an ideal gas
6. Thermodynamic functions of an ideal gas
7. Chemical Equilibrium
8. Transition State Theory

<b>Grading:</b>	Exam 1	20%
	Exam 2	20%
	Exam 3	20%
	Final Exam	30%
	Homework	10%
	Class Participation	± 5%

**Instructor:** James Farrell      306-F Civil Engineering Building  
Office hours:      TBD or by appointment  
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**Text:**      *Physical Chemistry: Thermodynamics, Statistical Mechanics*  
Horia Metiu, Taylor & Francis, 2006.

**Additional Policies, Warranties and Disclaimers:**

1. Required attendance policy: Attendance at lectures is not mandatory. For examinations: All holidays or special events observed by organized religions will be honored for those students who show affiliation with that particular religion. Absences pre-approved by the UA Dean of Students (or Dean's designee) will be honored.
2. Late homework will not be accepted without prior approval of the instructor.
3. Policies regarding expected classroom behavior: no use of cell phones or mobile devices during class.
4. Policies against plagiarism follow the Student Code of Academic Integrity: <http://deanofstudents.arizona.edu/policies-and-codes/code-academic-integrity>.
5. Policies against threatening behavior by students: <http://policy.web.arizona.edu/threatening-behavior-students>.
6. Policies against discrimination and harassment: <http://policy.arizona.edu/human-resources/nondiscrimination-and-anti-harassment-policy>.
7. Required extracurricular activities: none
8. Special materials required for the class: none
9. Accommodations for students with disabilities: It is the University's goal that learning experiences be as accessible as possible. If you anticipate or experience physical or academic barriers based on disability or pregnancy, please let me know immediately so that we can discuss options. You are also welcome to contact Disability Resources (520-621-3268) to establish reasonable accommodations.
10. Information contained in the course syllabus, other than the grade and absence policies, may be subject to change with reasonable advance notice, as deemed appropriate by the instructor.
11. Final Exam Regulations:  
<http://www.registrar.arizona.edu/schedule101/exams/examrules.htm>
12. Final Exam Schedule: <http://www.registrar.arizona.edu/schedules/finals.htm>.