

Chemistry 534 – Statistical Mechanics (3 cr., Spring 2014)

MWF 11:10 – 12:00 Bryan 404

Instructor: Prof. Kirk Peterson Fulmer 104B (335-7867)
Office Hours: By appointment
Email: kipeters@wsu.edu
Class web page: <http://tyr0.chem.wsu.edu/~kipeters/Chem534/>
Text: Statistical Mechanics: A Concise Introduction for Chemists, by Benjamin Widom, Cambridge University Press, 2002.
Recommended:
Statistical Mechanics, by Norman Davidson (Dover)
Statistical Mechanics, by Donald A. McQuarrie (Univ. Press)

Point Distribution:

Hour Exams (2 x 250 pts)	500
Final Exam (cumulative)	300
Homework (9 total)	200
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TOTAL	1000

Grading:

850 – 1000 A
801 – 849 B+/A-
650 – 800 B
600 – 649 C+/B-
< 600 C

Tentative Schedule

Jan 13-17	Topic: (Ch. 1) Ensembles, Probabilities, Probability distributions, Boltzmann distribution, partition functions, into to stat thermo
Jan 20-24	Mon. class holiday (MLK day) Topic: Chapter 1 continued
Jan 27-31	Topic: (Ch 2) Ideal gases: Boltzmann statistics, molecular partition functions
Feb 3-7	Topic: Chapter 2 continued
Feb 10-14	Topic: (Ch 3) Chemical equilibrium
Feb 17-21	Mon. class holiday (President's day) Topic: (Ch 4) Ideal solids and blackbody radiation (harmonic crystals, Rayleigh-Jeans, Debye theory) Exam 1 on Friday (Chapters 1-3)

Feb 24-28	Topic: Chapter 4 continued
March 3-7	Topic: (Ch 5) The third law of thermodynamics
March 10-14	Topic: (Ch 6) Non-ideal gases (virial expansion, intermolecular potentials)
March 17-21	Spring Break
March 24-28	Topic: Chapter 6 continued
March 31-April 4	Topic: (Ch 7) Liquids (molecular dynamics, Monte Carlo)
April 7-11	Topic: Chapter 7 continued
April 14-18	Topic: (Ch 8) Quantum ideal gases (Bose-Einstein and Fermi-Dirac statistics), grand canonical partition function Exam 2 on Friday (Chapters 4-7)
April 21-25	Topic: Chapter 8 continued
April 28-May 2	Wrap, catch-up
May 5 (3:10 – 5:10)	FINAL EXAM (cumulative) , to be held in Fulmer 124

Learning Outcomes

Student Learning Outcomes At the end of this course, students should be able to:	Course Topics/Dates The following topic(s)/dates(s) will address this outcome:	Evaluation of Outcome: This outcome will be evaluated primarily by:
Define basic terms and concepts in statistical mechanics	Throughout course	Homework and Exams
Apply statistical mechanical methods to standard problems in statistical thermodynamics	Weeks 1-8	Homework and Exams
Develop a foundation in statistical mechanics that can be applied to practical problems involving more complex liquids and solids	Weeks 9-15	Homework and Exams

University boilerplate

Academic Integrity:

I encourage you to work with classmates on assignments. However, each student must turn in original work. No copying will be accepted. Students who violate WSU's Standards of Conduct for Students will receive an F as a final grade in this course, will not have the option to withdraw from the course and will be reported to the Office Student Standards and Accountability. Cheating is defined in the Standards for Student

Conduct WAC 504-26-010 (3). It is strongly suggested that you read and understand these definitions.

Reasonable Accommodation Statement:

Students with Disabilities: Reasonable accommodations are available for students with a documented disability. If you have a disability and need accommodations to fully participate in this class, please either visit or call the Access Center (Washington Building 217; 509-335-3417) to schedule an appointment with an Access Advisor. All accommodations MUST be approved through the Access Center. For more information contact a Disability Specialist on your home campus:

Pullman or WSU Online: 509-335-3417

<http://accesscenter.wsu.edu>, Access.Center@wsu.edu

Spokane: <http://spokane.wsu.edu/students/current/studentaffairs/disability/>

Tri-Cities: <http://www.tricity.wsu.edu/disability/>

Vancouver: 360-546-9138 <http://studentaffairs.vancouver.wsu.edu/student-resource-center/disability-services>

Safety and Emergency Notification:

Washington State University is committed to enhancing the safety of the students, faculty, staff, and visitors. It is highly recommended that you review the Campus Safety Plan (<http://safetyplan.wsu.edu/>) and visit the Office of Emergency Management web site (<http://oem.wsu.edu/>) for a comprehensive listing of university policies, procedures, statistics, and information related to campus safety, emergency management, and the health and welfare of the campus community.