

Chem 2220 Physical Chemistry II Spring 2023

Instructor:

Professor Marsha I. Lester

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Office: Chem 262 (Cret Wing)

Phone: 215-898-4640

Lester Drop-in Hours (in Person)

Teaching Assistants:

TA Office Hours

Syllabus: Chapters 1-8, 12-19 of Engel and Reid; topics covered are listed below and detailed on Canvas; not all sections of text will be covered. Supplementary enrichment topics from other chapters and literature will be included.

Topics to be covered:

Fundamental Concepts of Thermodynamics; Heat, Work, Internal Energy, Enthalpy, and the First Law of Thermodynamics; Importance of State Functions: Internal Energy and Enthalpy; Thermochemistry; Entropy and the Second Law of Thermodynamics; Chemical Equilibrium; Properties of Real Gases, Phase Diagrams and the Relative Stability of Solids, Liquids, and Gases; Probability; Boltzmann Distribution; Ensemble and Molecular Partition Functions; Statistical Thermodynamics; Kinetic Theory of Gases; Transport Phenomena; Elementary Chemical Kinetics; Complex Reaction Mechanisms; Math Essentials

Text

Thomas Engel and Philip Reid – *Thermodynamics, Statistical Thermodynamics, and Kinetics* 4e. Here is the [link](#) to purchase etext for \$9.99/mo (4 month minimum). Other options through Publisher or Amazon (Hard Cover, Loose Leaf, or Rent).

Lectures:

Ed Discussions to facilitate course communication:

This term we will be using Ed Discussions / Ed STEM for questions and discussion outside of class time and office hours. The system is highly catered to getting you help fast and efficiently from classmates, the TAs, and myself. Rather than emailing questions directly to the teaching staff, please consider posting your questions on that platform.

Recitations: Small group work during recitations and associated weekly homework assignments. Working plenty of suggested homework problems is essential for learning the material and performing well on the exams.

Exams: Exam dates: Three hour exams during semester, and additional hour exam during final exam period. No makeup exams will be given, except for serious illness or other emergency (both require official documentation).

Course grades: The grade will be based on completion of homework and exam scores. Each exam will yield a maximum of 100 points, and homework a maximum of 100 points (total: 400 points).

Preliminary Grading Scale: > 97% **A+**, 97-90 **A**, 90-80 **A-**, 80-75 **B+**, 75-70 **B**, 70-65 **B-**, 65-55 **C**, 55-50 **D**, < 50 **F**.

This grade scale will be guaranteed. Exam scores may be adjusted to ensure that the class average is not below a B.

Preliminary Summary of grading:

Weekly homework assignments	20%
Class participation	≥ 5%
Exam 1, TBD	20%
Exam 2, TBD	20%
Exam 3, TBD	20%
Final Exam	20%
TOTAL	105%

Regrades: Regrades must be requested in writing within 24 hours after the exams are returned to students, preferably immediately after recitation. If a regrade is requested, the entire exam will be reexamined.

Resources: The course moves quickly and will be challenging. Please stay current with the material. We are here to help you. Welcome to Chem 222!

Tutoring Resource through Weingarten Center:

Two excellent students from Chem 221-222 in prior years are serving as tutors through the Weingarten Center!

Link to the Weingarten Tutoring page – Using this link will accommodate the appropriate registration process for all students (those who have not used these services and need a registration meeting or those who can just submit their request online): <https://wlrc.vpul.upenn.edu/tutoring-services/>

- Link to submit a request for a tutor (only usable for students who are already registered with Weingarten): <https://uapps.vpul.upenn.edu/tutoring-tutee>
- Link to make an appointment to become registered with Weingarten: <https://upenn-accommodate.symplicity.com/>

Questions? Contact Valerie Leduc Wrenn vwrenn@upenn.edu

Important Dates:

January 24, 2023	Course Selection (Add) Period Ends
February 20, 2023	Drop Period Ends
March 27, 2023	Last Day to Withdraw from a Course

Mental Health Resources: The Chemistry Department is here to support you! Here at Penn Chemistry, we care about the holistic well-being of our students. While focusing on academics, it is important to attend to your physical and mental health as well. Anxiety and depression are all too common in high-stress environments. If you are concerned about yourself or a friend, please reach out to either the Chemistry Undergraduate Office or the Chemistry Graduate Office (see below) who will direct you to the appropriate resources. If you, or anybody you know, is in need of mental health care, please refer to the following campus resources: (1) Counseling and Psychological Services, [CAPS](https://www.caps.upenn.edu/) 215-898-7021 (off hours and weekends 215-349-5490); (2) Department of Public Safety 215-898-7333, or 511 if imminent danger to themselves or others; (3) Finding Programs for Student Wellness through the [VPUL](https://www.vpul.upenn.edu/); and (4) [Student Health Services](https://www.studenthealth.upenn.edu/).

Inclusion and Diversity: At Penn Chemistry, we value the backgrounds and identities of all students (including but not limited to country of origin, race, class, religion, ethnicity, gender, sexual orientation and identity, and disability status), and are committed to providing an inclusive climate across the Department. If there are elements of your experiences, culture or identity that you would like to share with me as they relate to your success in this class, I am happy to meet to discuss. Likewise, if you have any concerns in this area or are facing any special issues or challenges, you are encouraged to discuss the matter with me (set up a meeting by email) with an assurance of full confidentiality, or with the Chemistry Undergraduate or Graduate Office (see below).

Formal and Informal Accommodations: The Chemistry Department at Penn is committed to assisting students requiring special accommodations for circumstances that are registered with the Office of Student Disability Services (SDS; <https://www.vpul.upenn.edu/lrc/sds/>). The University of Pennsylvania provides reasonable accommodations to students with disabilities who have self-identified and been approved by the Office of [Student Disabilities Services](https://www.vpul.upenn.edu/lrc/sds/) (SDS). Students need to make arrangements with SDS. If you have not yet contacted SDS and would like to request accommodations or have questions, you can make an appointment by calling SDS at 215-573-9235. The office is located in the [Weingarten Learning Resources Center](https://www.vpul.upenn.edu/lrc/sds/) at Stouffer Commons 3702 Spruce Street, Suite 300. All services are confidential. If you are not formally registered with SDS and experience anxiety, depression, learning disabilities or other issues that affect your ability to fully participate and learn in this class, you are encouraged to check-in with me or with the Chemistry Undergraduate Office or the Undergraduate Biochemistry Program Office (see below) so that we can help you to secure the resources to promote your success.

For help with any of these issues, please feel free to reach out to the Chemistry Undergraduate Office [Professor Jeffrey Winkler, Undergraduate Chair (winkler@upenn.edu) or Ms. Candice Adams, Undergraduate Coordinator (chemgrad@sas.upenn.edu)] or the Chemistry Graduate Office [Professor Dan Mindiola (mindiola@sas.upenn.edu) or Graduate Coordinator (chemgrad@sas.upenn.edu)] who will direct you to the appropriate resources.