COURSE SYLLABUS: CH3510, PHYSICAL CHEMISTRY I
FALL, 2013

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Office Hours: by Appointment (arrange via email or verbally)


Physical Chemistry, CH3510, covers the fundamental theories and experiments underlying modern chemistry. CH3510, Physical Chemistry I, covers thermodynamics, chemical equilibrium, electrochemistry, and kinetics. A major part of this course is the development of problem solving skills. This chemistry and these problem solving skills underlie all science and engineering disciplines. Thus, a large component of this course is problem oriented. Begin your study in your pre-lecture reading of the text; follow this by studying your text, the worked example problems, and the assigned homework problems. Lecture will guide you through the important material and help with difficult concepts. You will apply the principles discussed via solving problems. These skills are further exercised and perfected as you work (and hand-in) the assigned, homework problems. Finally, these skills are tested on the mid-term exams and the final exam.

TENTATIVE COURSE OUTLINE:

1. Introduction, overview of physical chemistry, ideal gases, and mathematical review
   (This overview of the entire field of physical chemistry has been sent out to you via email.)
2. Equations of state, energy, work, heat
3. 1st law of thermodynamics, enthalpy, heat capacities, C_v and C_p
4. Joule-Thompson experiment, phase and chemical changes
5. Spontaneous changes, entropy
6. Carnot cycle, 2nd law of thermodynamics, 3rd law of thermodynamics
7. Gibbs and Helmholtz free energies, Maxwell relations, pressure and temperature dependence of G
8. Phase diagrams, phase stability, chemical potential (μ)
9. Clapeyron equation, partial molar quantities
10. Thermodynamics of mixing, Raoult’s and Henry’s laws, colligative properties
11. Activities, Debye-Hückel Law, multicomponent phase diagrams, interpretation of phase diagrams
CH3510 SYLLABUS: Outline (continued)

12. Reaction Gibbs energies, equilibrium constants, cell reaction and half reactions
13. Nernst equation, standard electrode potentials, reaction rates and rate laws
14. Integrated rate laws, Arrhenius equation, chain reactions

GRADING:  
Hour Exam I 100 points
Hour Exam II 100 points
Homework Problem Sets 100 points
Final Exam 200 points
Total 500 points

Evening Exams:  On exam weeks, there will be class the day of the exam, but no class on Friday after the exam. There is no predefined scale for the grades on exams. After each exam, the break-points for the grades will be given. Re-grades for any exam must be requested within one week after the return of the exam. All students will be required to take the final exam.

Home Work Problems:  Practice homework problems (HWP) will be assigned in class, handed-in, and graded. These will test your understanding of the material and give you experience with the kind of problems that will be on the exams.

EXAM POLICIES

Preparing for the Exam

NO MAKE-UPS for missed exams. Plan on taking the exam at the assigned times. If you have a valid reason to be absent from an exam (for a field trip, job interview, athletic event, etc.), notify the instructor prior to the exam. If an unanticipated problem makes it impossible to attend an exam, notify the instructor as soon as possible. An extended delay will be considered to be an unexcused absence. An unexcused absence will be an automatic zero for that exam. Excused absences result in the average of your other midterm exams being awarded for the missed exam.

Excused/Unexcused Absences:

- Granted by the Office of Student Affairs. If you know that you will have an official university excused absence on exam day (university athletic event or religious holiday), you are required to make arrangements as early as possible in advance of the exam date.
- Examples of excused absences granted in the past include serious illness (medical excuse required) or a death in the family. Excuses may be documented through the Office of Student Affairs.
- Examples that are NOT excused: travel home or to attend a social event.
CH3510 SYLLABUS: Exam Policies (continued)

Taking the Exam:
- One 3x5 equation card (on Final – two 3x5 equation cards)
- Come on-time and seat yourself promptly in proper test seating arrangement.
- Bring only allowed items. Do NOT bring cell phones, Blackberries, CD players, iPads, iPhones, PDAs, earphones, or any other electronic devices. Calculators on other devices are strictly prohibited.

After Exams – Tracking Your Score
- Exam Scores (individual and cumulative) will be posted on Canvas.
- Answer Keys will be provided after each exam.

Canvas Information
The Canvas site for CH3510 can be accessed at http://courses.mtu.edu/.
Click on “MTU ISO Log In.” Enter your MTU Login ID and your MTU ISO password
In the list of courses for which you are enrolled, click on CH3510.
You may track your grades within Canvas using the Grade tool. Periodically examine these grades to confirm accuracy, and please report any discrepancies to me. A copy of this Syllabus is available there, as well.

UNIVERSITY POLICIES:

Academic Dishonesty:
Academic integrity is expected. Any violations will result in a 0 for the course and a recommendation of expulsion from MTU. Michigan Tech has standard policies on academic misconduct. Policies and procedures are in “Academic Integrity at MTU – A Guide for Students and Faculty.” Specific violations include: copying from another’s work or exam, allowing copying from your work or an exam, or facilitation of any academic dishonesty.
Cell phones, Blackberries, iPods, iPads, iPhones, PDAs, or any other electronic devices are not to be used in the classroom. Information exchanges on these devices (or calculators) during class are also prohibited and violate the Academic Integrity Code of Michigan Tech.
Refer to: http://www.mtu.edu/dean/conduct/policy/academic-integrity

Assessment: Student work products (exams, essays, projects, etc.) may be used for purposes of university, program, or course assessment. All work used for assessment purposes will not include any individual student identification.

MTU ADA Statement, Disabilities, and Affirmative Action: If you have a disability that could affect your performance in this class or that requires a reasonable accommodation for equal access to education or services at MTU, under the Americans with Disabilities Act (ADA), please see me as soon as possible so that we can make appropriate arrangements. The Affirmative Action Office (http://www.mtu.edu/dean/disability/policies) has asked that you be made aware of the following:

MTU complies with all federal and state laws and regulations regarding discrimination, including the Americans with Disabilities Act of 1990. For more information about reasonable accommodation for or equal access to education or services at MTU, please call the Dean of Students Office, at 487-2212. For other concerns about discrimination, you may contact your advisor, department head or the Affirmative Action Office, at 487-3310.