

## CH 341 - APPLIED PHYSICAL CHEMISTRY - FALL 2012

**Credit:** 3 hours

**Prerequisites:** CH 112, 112L  
MA 122 or 125

**Instructor:** Dr. Michael B. Moeller

**Office** - FSB 307

**Phone:** 256-765-4479

**Office Hours** - M,W,R,F 9:00 – 10:00  
W,R,F 11:00 – 12:00

Other times by appointment

**Description:** A survey course of physical chemistry treating equations of state, transport properties, thermodynamics with a focus on thermochemistry, chemical equilibrium, and chemical kinetics.

**Text:** Peter Atkins and Julio de Paula, The Elements of Physical Chemistry, 5th ed. 2009

**Purpose:** Chemistry 341 provides an introduction to physical chemistry with an emphasis on life sciences applications, especially in areas related to the field of industrial hygiene.

**Course Objectives:** In this course you will be studying the physical and chemical properties of systems, equations of state, the postulates of thermodynamics, phase equilibrium, chemical equilibrium, and chemical kinetics. Hopefully you will attain an understanding of the historic development of equilibrium thermodynamics and an appreciation for its logic and capabilities. You will also be introduced to the principles and methods of chemical kinetics and to the analysis of kinetic data in terms of reaction mechanisms.

**Evaluation Procedure:** Your knowledge base in each of these objectives will be assessed by homework exercises, exams and a comprehensive final.

4 hour exams @ 100 pts.....	400 pts
final exam @150 pts....(1:00 p.m., Monday, Dec. 10, FSB 301).....	150 pts
Turning Point class questions @ 2pts. each.....	100 pts
≈60 homework exercises.....	(estimated) 180 pts
TOTAL	(estimated) 830 pts

There will be approximately 830 points available during the semester. Final grades in this course will be assigned according to the following schedule: Students having 90% or more of the total points possible will receive an A. Students having between 80% and 90% of the total points will receive a B for the course. The cut offs for the grades C and D are 70% and 60% of the total points, respectively.

The hour exams will typically be 20% multiple choice or short answer, testing your knowledge of the descriptive material and concepts. The remaining 80% of each exam will involve solving problems. These problems generally will be similar to examples worked class, the problems found at the end of sections in the text or the exercises assigned for homework. The final exam will be all multiple-choice with approximately 50% of the questions being numerical problems. Because on the final exam there is not partial credit given for answers and because of incomplete knowledge decoys, the

scores on the final exam tend to be low. Please do not rely on the final exam to pull up your total point percentage.

The Department of Chemistry and Industrial Hygiene uses CH 341 to assess the following learning outcomes:

- Students will be able to apply gas laws.
- Students will be able to quantitatively employ chemical thermodynamics.
- Students will be able to apply concepts of chemical kinetics.

CH 341, together with CH 341L, provides instruction in and assesses the following standards required for chemistry by the Teacher Education Program:

- 290-3-3-.17(1)(c)1 Knowledge of molecular orbital theory and aromaticity  
[Evaluated by experiment 10 lab report]
- 290-3-3-.17(1)(c)2 Knowledge of superconductors and principles of metallurgy  
[Evaluated by Turning Point slides]
- 290-3-3-.17(1)(c)3 Knowledge of advanced concepts of chemical kinetics and thermodynamics  
[Evaluated by Turning Point slides]
- 290-3-3-.17(1)(c)9 Knowledge of energy flow through chemical systems  
[Evaluated by Turning Point slides]
- 290-3-3-.17(1)(c)14 Knowledge of principles of electrochemistry  
[Evaluated by Turning Point slides]
- 290-3-3-.17(1)(c)15 Knowledge of mathematics, including statistics, calculus, and differential equations  
[Evaluated by laboratory and lecture homework exercises]

**Attendance & Withdrawal Policies:** The last day to drop the class with a WP/WF is November 26. If you are absent from an hour exam due to illness or unusual circumstance beyond your control, it is your responsibility to contact the instructor to arrange for a make-up exam.

In accordance with the Americans with Disabilities Act (ADA) and Section 504 of the Rehabilitation Act of 1973, the University offers reasonable accommodations to students with eligible documented learning, physical and/or psychological disabilities. Under Title II of the Americans with Disabilities Act (ADA) of 1990, Section 504 of the Rehabilitation Act of 1973, and the Americans with Disabilities Amendment Act of 2008, a disability is defined as a physical or mental impairment that substantially limits one or more major life activities as compared to an average person in the population. It is the responsibility of the student to contact Disability Support Services to initiate the process to develop an accommodation plan. This accommodation plan will not be applied retroactively. Appropriate, reasonable accommodations will be made to allow each student to meet course requirements, but no fundamental or substantial alteration of academic standards will be made. Students needing assistance should contact Disability Support Services (256-765-4214).

**Academic Honesty.** Students of the university academic community are expected to adhere to commonly accepted standards of academic honesty. Allegations of academic dishonesty can reflect poorly on the scholarly reputation of the University including students, faculty and graduates.

Individuals who elect to commit acts of academic dishonesty such as cheating, plagiarism, or misrepresentation will be subject to appropriate disciplinary action in accordance with university policy.

Incidents of possible student academic dishonesty will be addressed in accordance with the following guidelines:

1. The instructor is responsible for investigating and documenting any incident of alleged academic dishonesty that occurs under the instructor's purview.
2. If the instructor finds the allegation of academic dishonesty to have merit, then the instructor, after a documented conference with the student, will develop a plan for disciplinary action. If the student agrees to this plan, then both instructor and student will sign the agreement. The faculty member will forward a copy of the signed agreement to the Office of Student Conduct for record-keeping purposes.
3. If the student disagrees with the instructor's proposed plan for disciplinary action and wishes to take further action, he/she is responsible for scheduling a meeting with the chair of the department where the course is housed to appeal the proposed disciplinary plan. The department chair shall mediate the matter and seek a satisfactory judgment acceptable to the faculty member based on meetings with all parties. If a resolution is reached, the disposition of the case will be forwarded to the Office of Student Conduct. If a resolution at the departmental level is not reached and the student wishes to take further action, he/she is responsible for scheduling a meeting with the dean of the college where the course is housed to appeal the proposed disciplinary plan. The college dean shall mediate the matter and seek a satisfactory judgment acceptable to the faculty member based on meetings with all parties. If a resolution is reached, the disposition of the case will be forwarded to the Office of Student Conduct. If a resolution at the college level is not reached and the student wishes to take further action, he/she is responsible for scheduling a meeting with the Vice President for Academic Affairs and Provost (VPAA/P) to appeal the proposed disciplinary plan. The VPAA/P shall mediate the matter and seek a satisfactory judgment acceptable to the faculty member based on meetings with all parties. After reviewing all documentation, the VPAA/P may, at his/her discretion, choose either to affirm the proposed action, to refer the case to the Office of Student Conduct for further review, or to dismiss the matter depending on the merits of the case. The final disposition of the case will be disseminated to appropriate parties, including the Office of Student Conduct.
4. If a student is allowed academic progression but demonstrates a repeated pattern of academic dishonesty, the VPAA/P may, after consultation with the Office of Student Conduct, assign additional penalties to the student, including removal from the University.