

APPLICATION FOR CHANGE IN EXISTING COURSE: **MAJOR** & MINOR

1. Submitted by College of Arts and Sciences Date December 17, 2001
 Department/Division offering course Chemistry
2. Changes proposed:
 (a) Present prefix & number CHE 442G Proposed prefix & number _____
 (b) Present Title Physical Chemistry II
 New Title Thermodynamics and Kinetics
 (c) If course title is changed and exceeds 24 characters (Including spaces), include a sensible title (not to exceed 24 characters) for use on transcripts: Thermodynamics/Kinetics
 (d) Present credits: 3 Proposed credits: _____
 (e) Current lecture:laboratory ratio 3:0 Proposed: _____
 (f) Effective Date of Change: (Semester & Year) Spring 2003
3. To be Cross-listed as: _____
 (Prefix & Number) (Signature: Dept. Chair)
4. Proposed change in Bulletin description:
 (a) Present description (including prerequisite(s):
A further development of the material introduced in CHE 440G: Advanced thermodynamic methods, statistical thermodynamics, quantum chemistry, and spectroscopy. Prereq: CHE 440G or CHE 446G; MA 213.
 (b) New description:
Principles of physical chemistry including thermodynamics, chemical kinetics, and statistical thermodynamics.
 (c) Prerequisite(s) for course as changed: CHE 226; MA 213; PHY 213 or 232
5. What has prompted this proposal? **As part of the revision of the physical chemistry curriculum for B.S. chemistry majors, the nature of this course is being revised. See attached proposal for curriculum revisions.**
6. If there are to be significant changes in the content or teaching objectives of this course, indicate changes:
In this course, the topics in the new description will be covered in depth. See attached proposal for revision of the B.S. curriculum.
7. What other departments could be affected by the proposed change? **None**
8. Will changing this course change the degree requirements in one or more programs? * Yes No
If yes, attach an explanation of the change.*
9. Is this course currently included in the University Studies Program? Yes No
If yes, please attach correspondence indicating concurrence of the University Studies Committee.
10. If the course is a 100-200 level course, please submit evidence (e.g., correspondence) that the Community College System has been consulted.

*NOTE: Approval of this change will constitute approval of the program change unless other program modifications are proposed.

11. Is this a minor change? Yes No
 (NOTE: See the description on this form of what constitutes a minor change. Minor changes are sent directly from the Dean of the College to the Chair of the Senate Council. If the latter deems the change not to be minor, it will be sent to the appropriate Council for normal processing.)

12. Within the Department, who should be consulted for further information on the proposed course change?

Name/e-mail: Steven W. Yates Phone Extension: 7-7085

Signatures of Approval:

Boyd Haley
 Department Chair

Philip Haulmy
 Dean of the College

12/18/01
 Date

MAR 19 2002
 Date

JAN 8 2002
 Date of Notice to the Faculty

 *Undergraduate Council Date

 *Graduate Council Date

 *Academic Council for the Medical Center Date

 *Senate Council Chair Date of Notice to University Senate

*If applicable, as provided by the Rules of the University Senate

ACTION OTHER THAN APPROVAL:

The Minor Change route for courses is provided as a mechanism to make changes in existing courses and is limited to one or more of the following:

- a. change in number within the same hundred series;
- b. editorial change in description which does not imply change in content or emphasis;
- c. editorial change in title which does not imply change in content or emphasis;
- d. change in prerequisite which does not imply change in content or emphasis;
- e. cross-listing of courses under conditions set forth in item 3.0;
- f. correction of typographical errors. [University Senate Rules, Section III - 3.1]

Proposed Syllabus for CHE 442G
(to be taught in the Spring Semester)

Course Content CHE 442G is one of the two-semester of physical chemistry required of B.S. majors. CHE 442G will cover chemical thermodynamics (energy balances in macroscopic systems) and chemical kinetics (quantitative descriptions of the rates and mechanisms of chemical reactions). CHE 442G will also include an introduction to statistical thermodynamics (distribution of energy among discrete, quantized energy levels).

Prerequisites: CHE 226; MA 213; PHY 213 or 232

Textbook: I. N. Levine, *Physical Chemistry*, 5th Ed., McGraw-Hill, 2002
(Solutions Manual recommended)

Class Meetings: 9:00-9:50 AM; M,W,F
(43 class meetings of which 3 will be used for hour exams)

<i>Chpt</i>	<i>Topic</i>	<i>Lectures</i>
1 (& Review)	Introduction: Chemistry/Physics/Math Review	2
2	First Law of Thermodynamics	2
3	Second Law of Thermodynamics	3
4	Phase and Reaction Equilibria	2
5	Standard Functions and Tables	2
6	Reaction Equilibria in Mixtures of Ideal Gases	2
1-6	Hour Exam I	1
7	One-Component Phase Equilibria	2
8	Real Gases	1
9	Ideal Solutions	3
10	Real Solutions	2
11	Reaction Equilibria in Real Systems	2
7-11	Hour Exam II	1
12	Multicomponent Phase Equilibria	3
14	Electrochemistry	4
15	Kinetic-Molecular Theory of Gases	2
17	Reaction Kinetics	4
12-17	Hour Exam III	1
(22)	Introduction to Statistical Thermodynamics	4
All Covered	Final Exam	

Proposed Syllabus

Attendance: Students are expected to attend all class meetings. Attendance will be taken and will count for 5% of the final grade. Students who miss more than 20% of the class meetings may be required to withdraw, even if those absences are excused (see pp. 49-50 of the University Bulletin).

Excused Absences: The policy on excused absences is that described in the booklet *Student Rights and Responsibilities*. Students are expected to contact the instructor as soon as possible after a missed exam.

Problems: Problem assignments will be announced in class. Problems will be collected and scored, but will not be graded in detail. Copies of the solutions will be placed on the web (<http://www.chem.uky.edu>). Homework problems will count for 10% of the final grade.
NB/ Problems that are essentially identical on two papers or that are essentially identical to the examples in the solutions manual will be awarded 0 points.

Hour Exams: Hour exams will be given as indicated on the syllabus; they will cover lecture and problem material. Students are *not* responsible for material in the textbook unless it is covered in class or in assigned homework problems. Students must provide their own calculators.

Three hour exams will be given

Final Exam: The final exam will cover material from the entire semester.

Grading:	Hour Exams (3 @ 20% each)	60%
	Final Exam	25%
	Homework	10%
	Attendance	5%

Tentative plans for grade assignments:

<i>Final Average</i>	<i>Course Grade</i>
88.0-100.0	A
77.0-87.9	B
66.0-76.9	C
55.0-65.9	D
Below 55.0	E

Cheating: Students are hereby notified that the Chemistry Department considers any kind of cheating to be a very serious offense. The minimum sanction for a cheating offense is a course grade of E.

CHE 442G Syllabus

Spring 2001

Professor: Carolyn P. Brock
 Office: CP-105; Telephone: 257-1959; EMAIL: cpbrock@pop.uky.edu
 Office Hours: M,Tu, 3-4 PM; W,Th 10-11 AM, or by appointment

Textbook: R. A. Alberty & R. J. Silbey, *Physical Chemistry*, 2nd Ed., John Wiley & Sons, 1997
 (Solutions Manual recommended)

Class Meetings: 9-9:50 AM; M,W,F in CP-220

Web Address: <http://www.chem.uky.edu>

<i>Chpt</i>	<i>Topic</i>	<i>Dates</i>
12	Symmetry (and Group Theory)	Jan 10, 12, 17, 19, 22
9/10	Quantum Theory; Atomic Structure	Jan 24, 26, 29, 31, Feb 2
11	Molecular Electronic Structure	Feb 5
9, 10, 12	Hour Exam I	Feb 7
11	Molecular Electronic Structure	Feb 9, 12, 14, 16
13/14	Spectroscopy (Rotational/Vibrational; Electronic)	Feb 19, 21
15	Magnetic Resonance Spectroscopy	Feb 23, 26, 28
16	Statistical Mechanics	Mar 2
11, 13, 14, 15	Hour Exam II	Mar 5
16	Statistical Mechanics	Mar 7, 9, 19
17	Kinetic Theory of Gases	Mar 21, 23
19	Chemical Dynamics and Photochemistry	Mar 26, 28
20	Kinetics in the Liquid Phase	Mar 30, Apr 2
21	Macromolecules	Apr 4, 6
23	Solid-State Chemistry	Apr 9, 11, 13, 16, 18
16, 17, 19-21, 23	Hour Exam III	Apr 20
24	Surface Dynamics	Apr 23, 25
	Review	Apr 27
All Covered	Final Exam	Apr 30; 1-3 PM

Course Content CHE442G is the second-semester of a two-semester sequence in physical chemistry. Some of the material (especially quantum mechanics and spectroscopy) covered in CHE440G (or CHE446G) will be covered again, but in greater depth. Some new topics (especially symmetry, statistical thermodynamics, and solid-state chemistry) will be introduced.

Prerequisites: CHE 440G or 446G
Since this is an upper-division course specifically designed for Chemistry BS majors it is assumed that all students will have completed MA 113, 114, and 213, and either MA 214 or MA 322. Students should also have completed the PHY 231/241/232/242 sequence. It is assumed that students will have a basic working knowledge of the material in all 100- and 200- level courses of the Chemistry curriculum.

Attendance: Students are expected to attend all class meetings. Attendance will be taken and will count for 5% of the final grade.

Excused Absences: The policy on excused absences is that described in the booklet *Student Rights and Responsibilities*. Students are expected to contact the instructor as soon as possible after a missed exam.

Problems: Problem assignments will be announced in class. Problems will be collected and scored, but will not be graded in detail. Copies of the solutions will be placed on the web (<http://www.chem.uky.edu>). Homework problems will count for 10% of the final grade.
NB/ Problems that are essentially identical on two papers or that are essentially identical to the examples in the solutions manual will be awarded 0 points.

Hour Exams: Hour exams will be given as indicated on the syllabus; they will cover lecture and problem material. Students are *not* responsible for material in the textbook unless it is covered in class or in assigned homework problems. Students must provide their own calculators.

Three hour exams will be given

Final Exam: The final exam will be given from 1:00-3:00 PM on Monday, April 30. It will cover material from the entire semester.

Grading:	Hour Exams (3 @ 20% each)	60%
	Final Exam	25%
	Homework	10%
	Attendance	5%

Tentative plans for grade assignments:

<i>Final Average</i>	<i>Course Grade</i>
88.0-100.0	A
77.0-87.9	B
66.0-76.9	C
55.0-65.9	D
Below 55.0	E

Dropping: A student dropping the course on or before January 31 receives no grade. A student dropping the course between February 1 and March 9 receives a W regardless of class performance.
It is not possible to drop the class after March 9 unless special permission is obtained from the Dean of the student's College.

Cheating: Students are hereby notified that the Chemistry Department considers any kind of cheating to be a very serious offense. The minimum sanction for a cheating offense is a course grade of E.