

UNIVERSITY OF KENTUCKY
APPLICATION FOR CHANGE IN EXISTING COURSE: MAJOR & MINOR

Submitted by College of Arts and Sciences
Department/Division offering course Chemistry

Date April 7, 2003

2. Changes proposed:

- (a) Present prefix & number CHE 107 Proposed prefix & number
(b) Present Title General College Chemistry II
New Title n/a
(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: n/a
(d) Present credits: 3 Proposed credits: same
(e) Current lecture:laboratory ratio 2:1 Proposed:
(f) Effective Date of Change: (Semester & Year) Fall 2003

3. To be Cross-listed as: n/a (Prefix & Number) (Signature: Dept. Chair)

4. Proposed change in Bulletin description:

- (a) Present description (including prerequisite(s): A continuation of CHE 105. A study of the principles of chemistry and their application to the more important elements and their compounds. Not open to students who have completed only CHE 104 but is open to students who have completed both CHE 104 and 106. Prereq: CHE 105 or both CHE 104 and 106.
(b) New description: same (to be added: approved for Distance Learning)
(c) Prerequisite(s) for course as changed: no change

5. What has prompted this proposal? CHE 107 is a USP course that is required for a number of college majors and minors at the University of Kentucky. Enrollment in the course is high; exceeding or nearly meeting capacity every semester. Class size is large in all sections offered. The DLP section of the course is intended to reach students who cannot enroll in the face-to-face sections due to enrollment limitations or personal situations such as the need to earn a living or provide care for another individual. It might also appeal to learners who meet select criteria in terms of learning style and flexibility needs. It is not intended to compete with or pull enrollment away from the face-to-face sections of the course.

6. If there are to be significant changes in the content or teaching objectives of this course, indicate changes: No change in the content or the teaching objectives. The delivery method is being expanded to include distance education for this section. Examinations will continue in a face-to-face format, as delivered by the Chemistry Department. Student learning outcomes are the same as for the face-to-face sections. A Preview of the course structure may be found at <http://ecourses.uky.edu>. (To enter the Preview (1) click on Login, (2) click on Preview button at left, (3) click on Courses tab at top, (4) in Course Search box type CHE 107-201, (5) click on Go, and (6) click on Preview, bottom at right.)

7. What other departments could be affected by the proposed change? none

8. Is this course applicable to the requirements for a least one degree or certificate at the University of Kentucky? Yes No

9. Will changing this course change the degree requirements in one or more programs? * Yes No
If yes, attach an explanation of the change.*

10. Is this course currently included in the University Studies Program? Yes No
If yes, please attach correspondence indicating concurrence of the University Studies Committee.

11. If the course is a 100-200 level course, please submit evidence (e.g., correspondence) that the Community College System has been consulted. n/a

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

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12. 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.)

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

Name/e-mail: Joe Wilson (jwilson@uky.edu)

Phone Extension: 257-3789 (W) or 266-0121 (H)

Signatures of Approval:

Boyd Haley
Department Chair

4/07/03
Date

David Leep
Dean of the College

5/7/03
Date

Reeta Huggs
*Undergraduate Council

4/17/03
Date of Notice to the Faculty
11/4/03
Date

*University Studies

Date

*Graduate Council

Date

*Academic Council for the Medical Center

Date

*Senate Council

Date of Notice to Univ. 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]

University of Kentucky

Addendum to Application for Major Change in an Existing Course to Distance Education Delivery

I. Departmental rationale and/or relationship of the proposed distance education course to department goals and objectives:

Chemistry 107 is a USP course that is required for a number of college majors and minors at the University of Kentucky. Enrollment in the course is high; exceeding or nearly meeting capacity every semester. Class size is large in all sections offered. The DLP section of the course is intended to reach students who cannot enroll in the face-to-face sections due to enrollment limitations or personal situations such as the need to earn a living or provide care for another individual. It might also appeal to learners who meet select criteria in terms of learning style and flexibility needs. It is not intended to compete with or pull enrollment away from the face-to-face sections of the course.

II. Proposed delivery methods) for this course: Web-centric for content delivery, formative assessment (homework and quizzes), and discussion; face-to-face for student evaluation (examinations).

III. Has the course been offered in a solely face-to-face presentation in the past?

<input checked="" type="checkbox"/>	Yes: Attach the syllabus for both the face-to-face and distance education presentations to this form
<input type="checkbox"/>	No: Attach only the distance education syllabus to this form.

IV. Measures of course quality and rigor, compared to face-to-face course offerings:

	Face-to-face Course (as available)	Distance Education Course	Additional Comments
Official Course Description: http://www.uky.edu/Registrar/bull0203/courses/descriptions.html	A continuation of CHE 105. A study of the principles of chemistry and their application to the more important elements and their compounds. Not open to students who have completed only CHE 104 but is open to students who have completed both CHE 104 and 106. Prereq: CHE 105 or both CHE 104 and 106.	Same	This course is part of the University Studies Program, which is designed to provide a comprehensive liberal arts education to all undergraduates. The course can be taken together with CHE 107 and CHE 115 to fulfill the Natural Science requirement in University Studies.
Course Goal (General statement about the intended purpose of the course)	This course provides a general introduction to the principles of chemistry.	Same	
Course Objectives (Student learning outcomes)	Course competence, as demonstrated by students earning a passing grade in the class.	Same	
Student Assessment/Evaluation Methods	Three departmentally administered examinations, at 20% each, Assigned Homework, Quizzes, Comprehensive Final Examination	Same	

V. Distance education is defined as a formal educational process in which the majority (more than 50%) of the instruction occurs when student and instructor are not in the same place. Instruction may be

synchronous or asynchronous, employing correspondence study, video conferencing, satellite technology, television, CD ROM, video or audiotape delivery, and online or web delivery techniques. Any institution that offers distance education opportunities is expected to meet the requirements of its accrediting body, in this case the Southern Association of Colleges and Schools, and be guided by published Principles, including specific expectations in the following areas.

- Curriculum and Instruction
- Evaluation and Assessment
- Library and Learning Resources
- Student Services
- Facilities and Finances

Is the course being offered through Distance Learning Programs?

	No: Attach information that explains how expectations in these 5 areas are met.
X	Yes: the following grid identifies the SACS/WICHE standards, describes how DLTC plans for, and provides evidence of meeting these standards for DLP courses.

Courses delivered through the Distance Learning Technology Center are designed and administered in a manner such that accreditation expectations are routinely met. Specific activities to meet the expectations prescribed for each of the five areas are detailed below.

Principle	Curriculum/Instruction
<p>Provision for timely and appropriate interaction between students and faculty, and among students.</p>	<p>This course, as all online courses developed by the DLTC, must contain three significant sets of interactions: student-content, student-student and student-instructor interaction as appropriate to the academic discipline and the nature of the course.</p> <p>The majority of distance education instruction at UK is provided through “structured access to and interaction with full-time faculty members.” Students are alerted to the nature of online courses and the requirements for active participation through various DLTC publications and the “Frequently Asked Questions (FAQ’s)” page at the DLTC web site at http://www.uky.edu/DistanceLearning/faqs.html & through opportunities to preview selected course content and syllabus. Many online courses are delivered simultaneously with various combinations of synchronous face-to-face, interactive television, and/or virtual meetings with students and/or faculty; and/or asynchronous delivery of CD-ROM or videotaped materials. The University offers no programs and few courses that are exclusively delivered in an online format.</p>
<p>The faculty assumes responsibility for and exercises oversight over distance education, ensuring both the rigor of programs and the quality of instruction.</p>	<p>This chemistry course was developed in response to an overture from a faculty member, endorsed by the department chair, to develop an online course to meet perceived student needs. The DLTC’s Instructional Development Group (IDG) developed it in conjunction with the faculty member over a six- month period.</p> <p>The identification of possible distance education audiences and programming efforts originates from individual faculty members, chairs, deans, and other academic officers, as well as from external authorities such as the Kentucky Legislature and the Council on Postsecondary Education and other initiatives emerging from constituencies within the state. The Distance Learning Technology Center also identifies opportunities and often seeks the review and endorsement from the appropriate academic department. Generally, the decision as to whether or not a course is to be developed and delivered as a distance education offering resides with the academic unit. However, the Director of the DLTC will intervene to discourage or take action to prevent a course from being offered that is not pedagogically sound or will be in violation of these principles.</p> <p>The appropriate Council, as evidenced by this document, reviews all distance education</p>

	courses, regardless of the technology employed for currency comparability of academic rigor and other features of quality.
There is assurance that the technology used is appropriate to the nature and objectives of the program.	There is a symbiotic relationship between the instructional development team and the instructor. It is becoming DLTC practice that before any technologically dependent course is developed or delivered, the faculty member engages in a discovery process with an instructional designer/consultant from the Instructional Development Group (IDG) to review the course goals and primary methodologies. Suggestions are made for how the distance education course can reflect the heart and soul of the campus experience. Each course is designed to employ one or more technologies to meet the instructional expectations and capitalize on the most effective delivery approaches. The DLTC does not invest in the development of a course that contradicts the principles of good practice or proposes to apply technologies inappropriately.
There is assurance that the materials are current for programs and courses.	Online courses are revised immediately after the close of the semester by IDG in conjunction with the faculty member while the experience is still fresh. Several weeks before the course is to be offered again, the faculty member responsible for delivering the course will review the course and at that time IDG will make any needed adjustments and updates. In some instances the currency of the academic offerings is no different than campus offerings since the instruction is delivered to both audiences concurrently as in interactive video classes. On-Campus and distance education materials, programs, and courses are reviewed as part of the Periodic Academic Unit review stipulated in Part IX of the GRs http://www.uky.edu/Regulations/GR/gr09.pdf .
The policies are clear concerning ownership of materials, copyright issues, and the utilization of revenue derived from the creation and production of software, tele-courses, or other media products.	Most distance education courseware products resulting from the faculty's efforts are considered to be similar to other traditional scholarly products. The policies governing ownership and fair use of intellectual property are detailed in AR II-1.1-3 - <u>Intellectual Properties Disposition and Administrative Regulation</u> , and AR II-4.0-4 <u>Intellectual Properties Committee</u> . Institutional ownership, the faculty member's use, and the institution's intentions to recover its investment should circumstances permit are addressed in these documents. The Distance Learning Librarian obtains copyright clearance on all materials before being embedded in the course. It is expected that a course will be offered at least three times to warrant the investment of time, talent and financial resources.
Appropriate faculty support services specifically related to distance education are provided.	The Distance Learning Technology Center (DLTC) has the primary responsibility for assisting both faculty and students engaged in distance education. Each of the DLTC units and services - Distance Learning Programs, Distance Learning Networks, Distance Learning Library Services, the Instructional Development Group and University Television have as their primary mission to support and assist in the development and delivery of distance education instruction. In particular, the development of on-line courses often requires specialized technical support provided by the Instructional Development Group. Ultimately, the "primary responsibility for the quality of the educational program resides with the faculty member" as the content expert; however, considerable assistance is available to faculty members employing the newer technologies.
Appropriate training for faculty who teach in distance education is provided.	The faculty member teaching this course has attended the four-hour Blackboard orientation, received additional individual training provided by IDG, and attended a multi day workshop on the use of "WebAssign" at North Carolina State University on special electronic problem sets & software. Blackboard training is conducted monthly with additional help sessions to orient faculty to building course components on the web. Periodically advanced training sessions are offered on such topics as course management techniques, building interactive communities, and online test development techniques. Follow up consultation is provided as requested.
	Evaluation & Assessment
There is assessment of	The DLTC supports student self-selection for distance education courses by working directly

<p>student capability to succeed in distance education programs and application of this information to admission and recruitment polices and decisions.</p>	<p>with Central Advising and by providing an Online Student Readiness for Distance Education Survey to all students logging into the Blackboard site at http://ecourses.ukv.edu. Additionally, all courses designed for Web delivery by the Instructional Development Group contain explicit announcements as to the student requirements with respect to self-directed learning and specific software, hardware, and other requirements necessary to successfully complete the distance course. Students enrolled in DL courses follow the University schedule for add/drop and incomplete grades.</p>
<p>There is evaluation of the educational effectiveness of its distance learning offerings (including assessments of student outcomes, student retention, and student satisfaction) to ensure comparability to campus-based programs.</p>	<p>Faculty members who are involved in the delivery of DL courses participate in a vigorous assessment and evaluation cycle. This cycle includes formative assessment and summative evaluation by students, self-evaluation and reflection post course delivery, and participation in focus groups by invitation. Prior to releasing a course, instructional design and communication standards are also assessed for successful downloading and navigation by learners and successful delivery by instructors. Additional data is gathered to substantiate the effectiveness of DL courses, such as retention rates, grade distribution, and median student portfolios. The DLTC works closely with the University of Kentucky Institutional Effectiveness Office and staff to stay accountable in terms of the types of assessment and evaluation employed, and to use strategies that are consistent in rigor and format to those strategies used institution-wide.</p>
<p>The integrity of student work and the credibility of the degrees and credits it awards are assured.</p>	<p>Every effort is made to design online courses in a manner that inhibits academic dishonesty in the assessment process. Online tests are timed so that students are not likely to be able to look up answers during the test, frequent testing may be employed to enable the instructor to have multiple observation of student progress. Many instructors will opt for alternative ways to assess student learning through papers, online discussion, and other creation of original works. In the design of the course, some face-to-face time may be scheduled to provide proctoring of exams, or in some special circumstances, others may be engaged to perform this monitoring process</p>
<p>Library & Learning Resources</p>	
<p>Students have access to and can effectively use appropriate library resources.</p>	<p>This is accomplished not only through a well-planned traditional acquisitions program but also through the enhanced capabilities of modern technology. The chief feature of this system is a digitized catalog (http://infokat.uky.edu/) accessible worldwide. Books and articles made available physically through Interlibrary Loan, a multiplicity of databases, indexes, online journals, and even online reserve readings are extended digitally to students through a proprietary proxy server. The Distance Learning Librarian's efforts are devoted full-time to bibliographic instruction (http://www.uky.edu/Libraries/dislearn.html), online and telephone reference service, Web site development, interface with faculty in web-based curriculum design, and also to coordinating services with the state-sponsored Kentucky Virtual Library http://www.kyvl.org/ The Distance Learning Librarian integrates support services and resources with curriculum objectives through close links with participating faculty. In addition to web-based instruction, the Libraries host a program for interactive compressed video instruction that serves over 300 sites. While such advanced technology plays a rapidly increasing role in distance education, it is complemented by membership in the Center for Research Libraries and also by a courier-serviced lending consortium with the University of Tennessee and Vanderbilt University.</p>
<p>Whether students make appropriate use of learning resources is appropriately monitored.</p>	<p>The library services are effectively supported by management mechanisms that utilize a written library plan and a written collection development policy, institutional effectiveness surveys, product use analyses, departmental needs assessments, and extensive technical support services via University Computing. Similarly, students taking online courses can be tracked in the Blackboard course software to determine their ability to enter the course, sections accessed, and the length of time they remain connected. Faculty members are prepared to monitor this information and advised to initiate contact with student if their presence is notably absent.</p>
<p>There is provision of laboratories, facilities, and equipment appropriate to</p>	<p>No special equipment or facilities are required for the delivery of this course. In order to assure appropriate proctoring of the departmental exams, arrangements will be made a proctor in close geographical proximity of the student to administer the exams as necessary.</p>

<p>the course or program.</p>	<p>The Distance Learning Programs Office makes all necessary arrangements on behalf of faculty members to accommodate planned learning experiences. Examples of these arrangements include finding meeting space and arranging for its use or lease, projection equipment, wet laboratory space, examination proctors and locations, providing funds for technical support at distant ITV locations, and similar support activities. Because of the use of many off campus locations, students are able to find directions to various locations through the DLTC web site or calling the office on the 1-800 number.</p>
<p>Student Services</p>	
<p>There is provision of adequate access to the range of student services appropriate to support the course and programs, including admissions, financial aid, academic advising, delivery of course materials, and placement and counseling.</p>	<p>The Distance Learning Programs Office provides assistance to students wishing to enroll in DL courses. A special 1-800 number is provided to expedite access and instructions may be found at http://www.uky.edu/DistanceLearning/info.html. Students requiring academic advising are referred to the appropriate campus office. The Graduate Bulletin states that distance education students must meet the same requirements as on-campus students and the delivery and evaluation of courses provided through distance education methods must be equivalent to those provided on-campus. Similarly, undergraduate distance education students must meet all admissions standards as on-campus students, and be accepted by the University before enrolling in distance education courses. Links from the DLTC pages connect students to a range of student services including financial aid, ordering textbooks, etc. At several of the major off-site facilities, Morehead, Hazard, Paducah and Covington there are full time faculty or staff members available to assist students directly.</p>
<p>Adequate means for resolving student complaints are provided.</p>	<p>Student complaints typically fall into two distinct categories: complaints about the functionality of the technology being employed, or complaints about some aspect of the course requirements, instructor behaviors or grading. Students may take their complaint directly to the Academic Ombud's Office at any time, however students are encouraged to lodge their complaints with the Distance Learning Programs Office. Once a complaint is received, it is triaged by the Director of Distance Learning Programs. Technology related problems are referred to the appropriate office within the DLTC or with Information Systems. Those complaints that are academic in nature are referred to the appropriate Departmental Chair or Academic Ombud http://www.uky.edu/Ombud/. The Information Systems Customer Service Center http://www.uky.edu/IS/CustomerService/contact.html provides technology support.</p>
<p>There is provision of student advertising, recruiting and admissions information that adequately and accurately represents programs, requirements, and services available.</p>	<p>Once course materials are developed and the faculty members are prepared to engage in instruction, the courses are listed with the Registrar's Office and published in the University Schedule Book and special Distance Learning publications and promotions. An online version is also available at http://www.uky.edu/DistanceLearning/catalog.pdf. These publications reflect the various programs' admission information, etc., refer or link to the Graduate School, Admissions Office, and other appropriate departmental sources. This information is also published in the <u>Bulletin, Graduate School</u> and included in the official UK Bulletin at http://www.uky.edu/Registrar/bulletin.html. All the information disseminated by the Distance Learning Technology Center is taken verbatim from published material approved by the academic unit. There are no exceptions to the admission standards and program requirements for courses delivered through distance education. The DLTC does not engage in academic advising but refers students to the appropriate department or central advising.</p>
<p>There is assurance that students admitted possess the knowledge and equipment necessary to use the technology employed in the program, and provides aid to students who are experiencing difficulty using the required technology.</p>	<p>Until the advent of online courses in 1999 there were few specialized knowledge and skills required of distance education students. An effort is made through the "FAQs" at the DLTC web site to describe the types of technology employed, and to assist students in assessing their readiness to take an online course. Additionally, students may find the minimal computer hardware and software requirements needed for taking online courses listed at http://www.uky.edu/DistanceLearning/online2.html#CCN. Further assistance is available to students through the Help Desk of Information Systems where they can obtain technical assistance over the phone or use the web site to download necessary software related to their course at http://www.uky.edu/helpdesk/. Students may find specific online instruction on how to use most of the standard software packages through Netg. A complete listing of Netg courses and other user tips may be found at http://www.uky.edu/IS/Training/CourseList.html.</p>

Facilities and Finances	
<p>The institution possesses the equipment and technical expertise required for distance learning.</p>	<p>The institution is uniquely positioned to deliver distance education courses through a variety of technological means. The University has 10 fully equipped interactive video classrooms on campus with the potential to connect with one or more locations at over 300 sites across the Commonwealth. Any classroom on campus can be connected to the University's satellite downlink, and up-link instruction can be delivered to over 1,200 downlink sites through out Kentucky. In December of 2000, UK installed the Blackboard Course Management software that is available to faculty for web enhancements to their on-campus courses and to selected distance education courses being primarily web based. This system was significantly upgraded during the Summer of 2002. The institution enjoys a strong relationship with Kentucky Educational Television (KET) located just on the edge of campus with its production and broadcast capabilities. In particular, tele-courses are offered both over KET and the University's own cable channels 16 and 19. More recently, the University has engaged in video conferencing over the Internet (known as H.323 technology) both for advising and for conducting small group graduate seminars for students located at great distances from each other. A cadre of technicians, instructional designers, and multi-media producers maintain the systems and provide services in direct support of course design, development, and delivery.</p>
<p>The institution's long range planning, budgeting and policy development processes reflect the facilities, staffing, equipment, and other resources essential to the viability and effectiveness of the distance education program.</p>	<p>Distance education activities and capabilities are assessed and reviewed by several formal and informal bodies. In addition to both the Offices of Undergraduate and Graduate Study, specific oversight is charged to the Distance Learning Advisory Committee, appointed by the President. This body in particular has historically been instrumental in supporting requests for funding to advance distance education at the University.</p> <p>A particular concern identified during the 2002 SACS visit was the lack of institutional planning for distance education that reached down into the departments. The Provost recently expressed his desire to have all distance education activities go through the DLTC and invited the DLTC to work with the colleges and departments to develop plans long range plans so as to anticipate needed capacity and better enable the DLTC to be responsive to the growing deployment of distance education technologies.</p>

UNDERGRADUATE COUNCIL

Criteria For Evaluating Course Proposals

1. Why is the course needed? To provide an alternative method for students to enroll and complete CHE 107.
2. Is there any duplication with another course or another program? If so, which course or program? This is an alternative but not a duplication of the course. It does have the same goals and objectives and will be assessed for comparability and rigor next to the face to face version.
3. What enrollment is anticipated? 15-20
4. Who will be served by the enrollment? It will not replace nor compete with face-to-face sections of the course but is designed to reach out to students who by life circumstance or geographical situation are not able to attend the face-to-face version
5. How often will the course be offered? Once a year
6. Is the course numbered at the appropriate level? Yes No
If no, what is the appropriate level? N/a

****Please see the attached syllabus and other documentation for items 7-10.

7. Evaluate Course content.
8. Are there course objectives? Yes No
9. Are there student learning outcomes? Yes No
10. Is the academic substance of the course worthy of the designated credit?
 Yes No
If no, explain. N/a
11. Have all departments involved with or affected by the offering or dropping of a course been contacted? Yes (Chemistry department) No
If no, explain.

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12. Is the course a prerequisite for other courses? Yes No
Which courses?

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13. Is it a program requirement? Yes No

14. What is the appropriate prerequisite for the course? CHE 105

15. Does the designated prerequisite still exist? X Yes No

16. Is an instructor available to teach the course? X Yes No

17. Has the proposal been signed by the appropriate individuals? X Yes No

RECOMMENDATION:

Syllabus for CHE 107-201 -- Fall Semester 2003

August 27-31	Topics	Physical Properties of Solutions - part 1
	<i>Chang Textbook</i>	Chapter 12: pages 467-474
	<i>Thinkwell Lectures</i>	13.1
	<i>Suggested Problems</i>	10, 12, 16-18, 22-24
	<i>Web Homework Due Date</i>	#1 -- midnight Sunday August 31, 12:00 a.m.
September 2-7 Week 2	Topics	Physical Properties of Solutions - part 2
	<i>Chang Textbook</i>	Chapter 12: pages 475-498
	<i>Thinkwell Lectures</i>	13.2 - 13.4
	<i>Suggested Problems</i>	28, 37, 52-68(even), 76-82(even), 86, 90, 92, 106
	<i>Web Homework Due Date</i>	#2 -- midnight Sunday, September 7, 12:00 a.m.
September 8-14 Week 3	Topics	Chemical Kinetics
	<i>Chang Textbook</i>	Chapter 13: pages 509-551
	<i>Thinkwell Lectures</i>	14.1 - 14.5
	<i>Suggested Problems</i>	6-8, 17-20, 27-30, 37, 38, 40, 49, 52, 66, 70, 74, 78, 79, 81, 82, 90, 98, 108
	<i>Web Homework Due Date</i>	#3 -- midnight Sunday, September 14, 12:00 a.m.
September 15-21	Topics	Chemical Equilibrium
	<i>Chang Textbook</i>	Chapter 14: pages 561-592
	<i>Thinkwell Lectures</i>	15.1 - 15.3
	<i>Suggested Problems</i>	14-20(even), 38-49(even), 52-60(even), 66, 67, 72, 74, 75, 80, 84, 90, 102
	<i>Web Homework Due Date</i>	#4 -- midnight Sunday, September 21, 12:00 a.m.
September 25	Exam 1 at 8:00 - 9:15 p.m.	
September 22-28 Week 5	Topics	Acids and Bases - part 1
	<i>Chang Textbook</i>	Chapter 15: pages 601-618
	<i>Thinkwell Lectures</i>	16.1 - 16.2.3
	<i>Suggested Problems</i>	3-8, 16-26(even), 42-48(even)
Sept 29 - Oct 5	Topics	Acids and Bases - part 2
	<i>Chang Textbook</i>	Chapter 15: pages 618-641
	<i>Thinkwell Lectures</i>	16.2.4 - 16.4
	<i>Suggested Problems</i>	60-62, 66-68, 76-80, 84, 86, 90-92, 102, 110, 118, 132
	<i>Web Homework Due Date</i>	#5 midnight Sunday, October 6, 12:00 a.m.
October 6-12	Topics	Acid-Base and Solubility Equilibria - part 1
	<i>Chang Textbook</i>	Chapter 16: pages 651-671
	<i>Thinkwell Lectures</i>	17.1 - 17.3
	<i>Suggested Problems</i>	10-18(even), 22-28(even), 31-34, 83, 84, 102, 114
	<i>Web Homework Due Date</i>	#6 midnight Sunday, October 12, 12:00 a.m.
October 13-19	Topics	Acid-Base and Solubility Equilibria - part 2
	<i>Chang Textbook</i>	Chapter 16: pages 671-691
	<i>Thinkwell Lectures</i>	17.4 - 17.5
	<i>Suggested Problems</i>	42-50(even), 55-58, 60-64(even), 68-72, 88, 91, 97, 112
	<i>Web Homework Due Date</i>	#7 -- midnight Sunday, October 19, 12:00 a.m.
October 23	Exam 2 at 8:00 - 9:15 p.m.	
October 20-26	Topics	Introduction to Thermodynamics
	<i>Chang Textbook</i>	Chapter 6: pages 225-234
	<i>Thinkwell Lectures</i>	6.1
	<i>Suggested Problems</i>	58-62
Oct 27 - Nov 2	Topics	Entropy, Free Energy and Equilibrium - part 1
	<i>Chang Textbook</i>	Chapter 18: pages 731-751
	<i>Thinkwell Lectures</i>	19.1 - 19.3
	<i>Suggested Problems</i>	2, 5, 9, 10-14(even), 16-20, 42, 44, 52, 58
	<i>Web Homework Due Date</i>	#8 -- midnight Sunday, November 2, 12:00 a.m.

November 3-9	Topics	Entropy, Free Energy and Equilibrium <i>and</i> Electrochemistry
Week 11	Chang Textbook	Chapter 18: pages 751-758 <i>and</i> Chapter 19: pages 765-780
	Thinkwell Lectures	19.4 <i>and</i> 20.1 - 20.2.4
	Suggested Problems	18: 24-32(even), 63, 64, 84; 19: 1, 2, 4, 8, 12-18(even), 22-26(even)
	Web Homework Due Date	#9 -- midnight Sunday, November 9, 12:00 a.m.

November 10-16	Topics	Electrochemistry
Week 12	Chang Textbook	Chapter 19: pages 780-800
	Thinkwell Lectures	20.2.5 - 20.5
	Suggested Problems	30-34(even), 38, 46-52(even), 58, 64, 70, 82, 90, 110
	Web Homework Due Date	#10 -- midnight Sunday, November 16, 12:00 a.m.

November 20	Exam 3 at 8:00 - 9:15 p.m.	
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November 17-23	Topics	Transition Metal Chemistry and Coordination Compounds - part 1
Week 13	Chang Textbook	Chapter 22: pages 877-887
	Thinkwell Lectures	23.1 - 23.2.2
	Suggested Problems	4, 5, 11-18, 24-26

November 24-30	Topics	Transition Metal Chemistry and Coordination Compounds - part 2
Week 14	Chang Textbook	Chapter 22: pages 887-902
	Thinkwell Lectures	23.2.3 - 23.3
	Suggested Problems	30, 32, 34-38
	Web Homework Due Date	#11 -- midnight December 1, 12:00 a.m.

November 24-30	Thanksgiving Day Holiday	
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December 1-7	Topics	Nuclear Chemistry
Week 15	Chang Textbook	Chapter 23: pages 909-937
	Thinkwell Lectures	21.1 - 21.3
	Suggested Problems	4-6, 14-20(even), 24, 26, 33, 34, 37, 43
	Web Homework Due Date	#12 -- midnight December 12, 12:00 a.m.

December 8-12	Topics	Review for Final Exam
Week 16		

December 15	Final Exam at 8:30 - 10:30 p.m.	
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