

## Chemistry 102-005 – Spring 2010 Lecture Syllabus

- Course:** Chemistry 102, General Chemistry B  
3 Credits: Lecture and discussion
- Prerequisites:** Chemistry 101 and 111, or 105 and completion of Math 118 with a grade of C- or better.  
A student may be withdrawn from the course at any time if the prerequisites have not been satisfied.
- Lecture:** MWF 11:30-12:20 pm Flanner Hall 133 Section 005  
You must also be registered in one of the accompanying discussion sections:
- Discussion:** M 10:25-11:15 am Mundelein 406 Section 008  
M 12:35-1:25 pm Flanner Hall 7 Section 006  
M 1:40-2:30 pm Flanner Hall 7 Section 007
- Instructor:** Dr. Sandra Helquist  
**Email:** shelquist@luc.edu – put “Chem 102-005” in subject line to receive a timely response  
**Phone:** 773.508.3139  
**Office:** Flanner Hall 213  
**Office Hours:** W 10-11am, F 1-2pm, immediately after WF lectures, or by appointment.  
You are encouraged to drop by my office during open times (see the schedule posted outside my door) if you cannot attend regular office hours.
- Textbook:** Chemistry & Chemical Reactivity, Kotz/Treichel/Weaver, 7<sup>th</sup> edition (Required)  
OWL Online Homework Access Code (Required)  
Study Guide and Solutions Manual to above text (Recommended)

### Course Content & Objectives

This lecture and discussion course is a continuation of Chemistry 101 and includes topics on solutions, kinetics, equilibrium systems, chemical thermodynamics, electrochemistry, and nuclear chemistry. Using the basic principles learned in the 101 course, students will deepen their conceptual understanding of specific complex topics in chemistry, and further develop their skills in scientific problem solving.

### Course Materials

There is a required textbook for lecture as well as recommended study guides to accompany the lecture text. Additionally, you must register for the OWL online homework system: <http://www.cengage.com/owl> & additional information/links posted on Blackboard. Access codes can be purchased as a package with your textbook from the bookstore or purchased separately online. Assignments will be due weekly. You will need the use of a scientific calculator for problem solving – your calculator does not need to graph, but the use of cell phone calculators will not be permitted during exams and quizzes. Calculators cannot be shared, and will never be provided by the instructor. Lectures will be presented as a combination of “chalk talks” and overhead or PowerPoint slides. All handouts for the lecture will be available on Blackboard (blackboard.luc.edu) and scores will be recorded in the Blackboard grade center. The Announcements section of the course page on Blackboard will be used regularly to communicate useful information. You will be permitted one 8.5 x 11” (single-sided) page of hand-written notes for the final exam only.

### Class Attendance

Vital for your learning: you are responsible for all material presented or handed out, as well as reading and problems recommended in lecture and discussion even if you are not in attendance for a course meeting. For each class you are expected to indicate your presence by signing in on the class roster sheet, to be circulated during the lecture. Attendance and Attention is important and required. Prepare for lecture by scanning the new material to be covered. Come prepared to engage in discussion, ready to ask questions on homework or yet unassimilated lecture material -- especially bring questions to discussion classes.

### Disability Accommodations

At times, students with disabilities may wish to avail themselves of the University’s ancillary services. Students who would like accommodations at the University need to contact the Coordinator of Services for Students with Disabilities. Contact information is available at <http://www.luc.edu/depts/lac/disabilities>.

## Academic Integrity

Research and learning in chemistry relies heavily on collaborative efforts. You are encouraged to study with other students during and outside of class, however, anything submitted for an individual grade must represent your own knowledge and understanding of the material. On exams you are expected to obtain information only from your own mind. Any student caught cheating will receive, at a minimum, a “zero” on the test, and penalty up to automatic failure of the course as well as referral to the Dean’s Office. You may review the University guidelines from the academic catalog at [http://www.luc.edu/academics/catalog/undergrad/reg\\_academicintegrity.shtml](http://www.luc.edu/academics/catalog/undergrad/reg_academicintegrity.shtml).

## Grading

Your grade for Chemistry 102 will depend on the following factors:

Homework	15%
Group Quizzes	10%
<u>Exams</u>	<u>75%</u>
Total	100%

Generally, 88% is the lowest A-, 75% the lowest B-, 60% the lowest C-, 50% the lowest D. Chemistry is not easy to learn, thus the grading policy allows for the lowest midterm exam score to be dropped in order to reward improvement by the final exam (see details below). Points for homework assignments and group quizzes are included to help students learn the material and improve their course grades. Each student will be assigned an estimated midterm grade following the 2<sup>nd</sup> midterm exam.

## Homework

Online, via OWL system, can be accessed anywhere, on or off campus. After the first week of classes, assignments are due every Tuesday at 11:59pm, strict deadline; “computer problems” do not merit extensions! OWL questions include easy- to moderate-level questions and are meant to help you learn the material by practicing it yourself. Full credit on each assignment (15% of your course grade) is expected to be earned by re-doing questions as necessary and learning from your mistakes via the instant feedback provided by the OWL program. Those students expecting the highest exam scores will further develop their understanding of the material and problem-solving skills by working the more difficult end-of-chapter problems as listed on page 4 of this syllabus.

## Group Quizzes

Groups will be announced by the instructor, and will change following each exam. Work must reflect efforts of ALL group members, and is meant to foster cooperation and communication between students for better understanding of material. Quizzes may be open-book unless otherwise announced in advance, and will include a variety of moderate to difficult exam-level questions. 30-40 minutes in length, held during each discussion period. No early quizzes, no make-ups in other sections. Your quiz score (10% of your course grade) will be calculated as the average of your scores, dropping the lowest score. If you miss a quiz for any reason, that quiz will count as the dropped score. Keep up with the material so that you can gauge your level of understanding on the quizzes in order to identify areas of weakness prior to the exams.

## Exams

No early exams, no make-ups! Exams will consist of multiple-choice and long-answer questions. Exams comprise 75% of your overall course grade, and will be calculated by the instructor as the higher score between these two options:

Option 1: 3 midterms, 15% each; final exam, 30%; Total exam score = 75%

Option 2: 2 midterms, 15% each; final exam, 45%; Total exam score = 75%

Midterms: 50 minutes, Friday February 12, Friday March 19, Monday April 19. If you miss a midterm *for any reason*, grading Option 2 will automatically be used to determine your grade.

Final: 2 hours, Monday May 3, 1-3pm, **MANDATORY**. The final exam must be taken on the date scheduled or a grade of F will automatically result. Comprehensive, with emphasis on selected topics TBA.

I will return your midterm exams during the discussion periods or in office hours (photocopies will be kept). Scoring errors must be brought to my attention in person no later than one week after the exams are returned. The final exam cannot be returned. A copy of the long-answer key will be posted in the display case by the elevators on 4<sup>th</sup> floor Flanner following each midterm exam.

## Exam Day Procedure

Cell phones, PDAs, mp3 players, are not permitted. If seen or heard, will be confiscated along with exam copy and student will be asked to leave. Come to the exam with your Loyola ID, and leave visible on desk during exam to be checked. All purses, bags, jackets, etc must be left at front of room. Once the exam is distributed, if you exit the room (quietly, please), for any reason before time is up, your exam is considered complete and will be collected.

Pay attention to instructions and clarifications given for each exam. You will be deducted points for failing to fill in your name on your exam sheet. You will also lose points if you fail to turn in your exam to a proctor promptly when time is called. Only answers that appear in the indicated answer blanks will be scored (this is especially critical for multiple-choice questions). If you have a question during an exam, raise your hand and a proctor will come to you. When you are instructed to begin any exam, take a minute to look over all of the questions. Start with the problems you are confident you can solve before moving on to questions for which you are unsure of how to begin. Prioritize your time where it will be well spent.

## Study Strategies and Suggestions

Because many topics we will cover build heavily on prior material, the best plan is to study chemistry regularly, every day, similar to practicing the piano. Experience dictates that positive outcomes (for exam and course grades) are directly proportional to working and UNDERSTANDING the assigned and suggested problems on a regular basis, i.e., applying the CONCEPTS learned in lecture to non-generic compounds and calculations. Overnight cramming will probably not produce success. The student should quickly read the chapter/segment to be covered before lecture to improve lecture comprehension. After lecture, careful detailed re-reading of the chapter/segment and focused working of the assigned and suggested problems are appropriate and expected, along with formulating follow-up/clarifying questions for your instructor by the next class meeting.

There are some things in any subject that must simply be memorized. Chemistry is no exception. Some students may find it helpful to make notecards or keep lists of important definitions and formulas to quickly master the material as needed to keep pace with the class. You are encouraged to form study groups – talk to the people sitting next to you in lecture or discussion and exchange phone numbers or email addresses – and attend office hours regularly to receive help.

*If anticipating a passing grade, the minimal time per week in the regular academic year devoted to General Chemistry is estimated at 4 hr for lecture/discussion, 2-4 hr for reading, and 4-6 hr for homework. It is up to the individual student to devote enough time to chemistry in order to achieve the desired grade. You are strongly urged to contact the instructor to discuss problems before they become serious.*

## Exam Preparation Suggestions

Practice, practice, practice. On exams you will be asked to work problems, therefore, you should study by working problems. Listed on the next page are questions from your textbook that you may find particularly helpful. When you are working multistep problems in class, in OWL, and from your textbook, write out all of the steps clearly so that you can find your own mistakes and correct them promptly. When you do not understand how to solve a problem, ask for help promptly: your success on exams will depend on understanding the concepts behind the problems, not just the math! Reading your textbook is important and expected on a regular basis to clarify material, assist with homework questions, etc, but reading and note-taking alone will probably not lead to high exam scores. You may wish to use the Chapter Goals as a review tool, or to make your own study guides/outlines prior to exams: find a review method that works for you. And practice, practice, practice, solving problems! *Exams consist of two parts:*

1. Multiple-choice questions ranging from definitions, formulas or concepts, to small calculations. Familiarize yourself with strategies for answering multiple-choice questions. No partial credit is given on these questions, and you must check your work meticulously for small mistakes that could cause you to obtain an incorrect answer. If the concept being tested is well-understood, each these questions should be answered easily in 1 minute.
2. Long answer questions requiring detailed calculations with all work shown. Partial credit may be awarded on these questions at the discretion of the instructor, but work should still be carefully checked for errors. These problems will require the student to rapidly identify the question being asked and the strategy required to solve the problem, but each may take several minutes to obtain a solution. The most difficult of these problems will involve combining several chemical equations and/or concepts to obtain a solution.

## Tutoring Center

The Tutoring Center offers free small group tutoring and walk-in tutoring for Loyola students. The groups meet once a week through the end of the semester and are led by a peer tutor who has successfully completed study in the course material. To learn more or request tutoring services, visit the Tutoring Center online at [www.luc.edu/tutoring](http://www.luc.edu/tutoring).

**Recommended End-Of-Chapter Problems** from your book: note that these are to be completed only for your own practice, not to be turned in for credit. All of the EOC problems are worthy of your time, however, if you do not have time to complete all of them, start first with these. If you require more practice with a particular topic, work the even numbered-problems in that section as well.

14: 17, 21, 25, 45, 51, 53, 55, 57, 63, 65, 73, 77, 79, 83, 91, 93, 97

15: 11, 1, 29, 39, 43, 45, 51, 55, 59, 61, 63, 65, 71, 77, 79, 81

16: 5, 11, 17, 23, 27, 29, 33, 35, 39, 43, 45, 59, 55, 57, 61, 63, 67, 69, 71

17: 3, 5, 15, 21, 31, 35, 43, 53, 61, 63, 67, 77, 79, 85, 89, 93, 99, 105, 107, 121

18: 5, 9, 19, 21, 23, 25, 29, 33, 37, 43, 49, 51, 53, 57, 61, 73, 75, 83, 89, 97, 99, 101, 111

19: 1, 7, 11, 13, 21, 23, 27, 31, 39, 41, 43, 47, 53, 57, 67, 71, 79

20: 3, 5, 7, 15, 17, 27, 29, 31, 37, 51, 53, 55, 61, 77, 79

23: 13, 15, 19, 21, 23, 31, 35, 37, 39, 43, 47, 51, 55, 57

## Tentative Lecture Schedule

Week	Dates	Monday	Wednesday	Friday
1	Jan 18, 20, 22	MARTIN LUTHER KING, JR.	Introduction, Solution Concentration (Ch. 14)	Solutions, Solubility (14)
2	Jan 25, 27, 29	Colligative Properties (14)	Reaction Rates (15)	Rate Laws, Constants (15)
3	Feb 1, 3, 5	Collision Theory (15)	Arrhenius, Mechanisms (15)	Equilibrium Constant (16)
4	Feb 8, 10, 12	Equilibrium Calculations, Concentrations (16)	Le Chatlier's Principle (16)	<b>EXAM I (Ch. 14-16)</b>
5	Feb 15, 17, 19	Bronsted-Lowry Acids & Bases (17)	pH, $K_a$ , $K_b$ , Acid-Base Equilibria (17)	Solution pH (17)
6	Feb 22, 24, 26	Acid-Base Reactions (17)	Polyprotic Species (17)	Common Ion Effect (18)
7	Mar 1, 3, 5	Buffers (18)	Buffers (18)	Acid-Base Titrations (18)
8	Mar 8, 10, 12	SPRING BREAK		
9	Mar 15, 17, 19	Acid-Base Titrations (18)	Solubility Equilibria (18)	<b>EXAM II (17-18)</b>
10	Mar 22, 24, 26	Solubility Equilibria (18)	Spontaneous Change (19)	Entropy, 2 <sup>nd</sup> Law of Thermodynamics (19)
11	Mar/Apr 29, 31, 2	Gibbs Free Energy (19)	Gibbs Free Energy (19)	GOOD FRIDAY
12	Apr 5, 7, 9	EASTER MONDAY	RedOx Reactions (20)	Electrochemical Cells (20)
13	Apr 12, 14, 16	Nernst Equation (20)	RedOx Equilibria (20)	Nuclear Decay (23)
14	Apr 19, 21, 23	<b>EXAM III (18-20)</b>	Decay Kinetics (23)	Fission & Fusion (23)
15	Apr 26, 28, 30	Nuclear Medicine (23)	Lewis Acids & Bases (17)	Selected Topics, Catch-up

**Monday May 3, 1-3pm**

**FINAL EXAM Comprehensive: Chapters 14-20, 23**