

Chem 102-001 Fall 2017 Syllabus

General Information¹

Course Chemistry 102, General Chemistry B; 3 Credits: Lecture and discussion

Prerequisites Chemistry 101 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 A student may be withdrawn from the course at any time if the prerequisites have not been satisfied.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 8:15 – 9:05 am in Cuneo Room 102

Discussion You must attend the section for which you are registered: Monday 9:20-10:10 or Monday 10:25-11:15 Flanner Hall Room 7.

Instructor Dr. Alanah Fitch

Email To receive a response use your Loyola email account and send to afitch@luc.edu with only Chem 102-001 in subject line. Emails will be answered within 3 days. If it is urgent please call 508-3119. Collective emails will be sent to the class via Sakai (to your Loyola account).

Office Flanner Hall 418

Office Hours You are welcome to stop by at any time to see if my door is open and check my posted schedule. For regular office hours, just show up with your questions anytime during: Monday, Wednesday, Friday 12:30-1:30pm; occasional extra hours may be announced in class

Course Content & Objectives

Prerequisite knowledge from Chemistry 101 is necessary for in-depth study of topics in Chemistry 102. We will focus on applying a conceptual understanding of fundamental chemical principles. Students will continue to learn the language of chemistry and develop their skills in scientific problem solving and critical thinking. This will serve as a foundation for further study in chemistry, other sciences and related disciplines.

The material is highly cumulative over two semesters, such that you will be able to do the following:

- Use multiple perspectives of matter (macroscopic, particle, symbolic levels) to qualitatively describe and explain characteristics, properties, and relationships of the following: liquids and solids, solutions, reaction kinetics, equilibria, acids and bases, reaction thermodynamics, electrochemical reactions.
- Quantify relationships between variables controlling chemical systems.
- Solve quantitative multistep problems combining multiple concepts within the systems.
- Differentiate among closely related factors, categorize problem types, and select appropriate tools to solve these problems.
- Apply chemical principles to explain natural phenomena.

IDEA Objectives: Chosen by the faculty for General Chemistry; also apply across other courses and disciplines

- Gaining a basic understanding of the subject (e.g., factual knowledge, methods, principles, generalizations, theories)
- Learning to *apply* course material (to improve thinking, problem solving and decisions)
- Gaining a broader understanding and appreciation of intellectual/cultural activity (music, science, literature, etc)
- Learning how to find, evaluate, and use resources to explore a topic in depth

Course Materials

The textbook/eText is Required for class (*Chemistry The Central Science*, Brown et al, 14th edition; can use copies on reserve at the Library); the student guide and solutions manual are Optional. Students that choose to use an alternate version of the textbook must do the extra work to align their reading/figures/problems with the current edition.

Web access is Required for use of the ALEKS learning system (links/information are posted on Sakai sakai.luc.edu).

Each student will need a scientific calculator – only calculators approved for use on the ACT exam are permitted – all calculator memory must be cleared prior to use on exams. Calculators cannot be shared between students.

Time Investment

¹ Much of this syllabus derives from that of Dr. Sandra Helquist. Many thanks to her.

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For a second-semester general chemistry course, the average independent working time (outside of class) required to learn the material to achieve a minimal passing grade of C- is 1.5-2.5 hours per day, every day, every week, of pre-and post-lecture reading, & homework, office hours, group study, additional preparation and problem-solving, spent by the student. This time is merely an estimate and it is up to you to devote the time necessary to achieve your desired course grade. Students expecting to obtain a C or better grade MUST work every day on the material. (Studying needs will vary depending on your prior knowledge and your ability to master cumulative concepts in the course material.)

Student and Faculty Expectations

Student Expectations Each student will determine her/his level of learning in the course. I expect each of you to make the decision to take ownership of your learning early during the semester, and to adjust your daily practices and habits as needed to reach your desired level of achievement in the course. It is up to you to access resources for help as often as needed: office hours, tutoring, study groups, mentoring, and more.

Faculty Expectations What can you expect of me? My primary objectives are to provide you with the tools, environment, encouragement, and support to learn Chemistry. I expect that all of us will work together to follow the classroom guidelines listed on the next page and to master the course objectives listed above. Please ask me for additional assistance, clarifications, and contact to me to provide feedback as needed.

Classroom Guidelines

- A “participant” is any person present in the classroom. If you have questions, concerns, or feedback about these guidelines, please contact me directly.
- All participants are expected to respect, value, and encourage each other’s contributions in the classroom. This will be done by:
 - Participants actively listening to each other’s presentations, questions and answers. Distractions (side conversations, use of personal devices, other) will be kept to a minimum.
 - Participants asking questions individually and in groups; participants engaging in problem-solving individually and in groups.
 - Correct, incorrect, incomplete and partial answers to questions will be critically but respectfully examined and discussed to cultivate conceptual understanding of material from multiple perspectives.
 - Participants will seek to engage with the material by finding areas of personal interest and exploring topics further by asking questions and seeking additional resources for information.

Class Attendance, No Makeup, and Content

Class attendance and active participation is expected of all students; there are no make-up classes or assignments. You are responsible for all material presented, handed out, or recommended. If you miss a class for any reason, contact a classmate promptly for notes and topics covered. Prepare for lecture by reading ahead in the textbook and working the ALEKS Objective. Come prepared to continue learning, ready to ask and answer questions individually and in groups. Lectures will be presented as a combination of “chalk talks” and slides/links/animations, and a large amount of time will be spent analyzing and working medium-to-difficult problems. Links, files, handouts and powerpoint slides will be posted on Sakai.

No early exams, no make-ups, no exceptions.

No early quizzes, no make-ups, no exceptions.

Academic Integrity

You are encouraged to study with other students in and out of class, however, anything submitted for an individual grade during or outside of class must represent your own knowledge and understanding of the material. Evidence of cheating (for homework, quiz, or exam) will result in, at a minimum, a “zero” on the item and penalty up to failure of the course, as well as referral to the Dean’s Office. For the Undergraduate Catalog statement on academic integrity, visit:

http://www.luc.edu/academics/catalog/undergrad/reg_academicintegrity.shtml

Accommodations

Students requiring accommodations must provide appropriate documentation from the University and meet with the instructor to discuss arrangements. Accommodations are provided after receiving documentation and allowance of a

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reasonable time frame for implementation: minimally, one week in advance of an exam. Accommodations cannot be retroactive. Information for students with disabilities is available at: <http://www.luc.edu/sswd/>

Sakai Items

- A tentative Course Schedule is posted in the [Course Materials](#) section and will be updated as needed. The ALEKS objectives will keep pace with the course schedule as pre-lecture preparation.
- A list of Highly Recommended Textbook problems is posted in the Course Materials section.
- A list of Best Practices and Suggestions is posted in the Course Materials section.
- Complete information and Tips for [ALEKS](#) and [MasteringChemistry](#) are posted and will be updated during the beginning weeks of the semester.
- All emails sent to the class via Sakai will also be posted as Announcements; announcements may be updated as needed.
- Additional resources will be continually posted and updated on Sakai.

Other Items

- A link to the official Loyola calendar can be found here: <http://luc.edu/academics/schedules/index.shtml>
- The Withdraw deadline for the semester is Monday March 27th. Students can seek assistance with LOCUS procedures from the Department office (Flanner 125), or from academic advising in the Sullivan Center.

Course Repeat Rule

Effective with the Fall 2017 semester, students are allowed only THREE attempts to pass Chemistry courses with a C- or better grade. The three attempts include withdrawals (W).

After the second attempt, the student must secure approval for a third attempt. Students must come to the Chemistry Department, fill out a permission to register form or print it from the Department of Chemistry & Biochemistry website: <http://www.luc.edu/chemistry/forms/> and obtain a signature from the Undergraduate Program Director, Assistant Chairperson, or Chairperson in Chemistry. A copy of this form is then taken to your Academic Advisor in Sullivan to secure final permission for the attempt.

- For information about Loyola tutoring in the Sullivan Center, see: <http://www.luc.edu/tutoring/>
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Grading	ALEKS	15%	Cutoffs:	A 91.0% A- 88.0%
	Group Quizzes	10%		C+ 72.0% C 64.0% C- 60.0%
	Exams	70%		D 50.0%
	Total score	100%		

These are the grade cutoffs for Total scores. Letter grades are only assigned to your Total score, not to individual assignments, quizzes or exams. Total **scores are not rounded up** after calculation.

Rationale for grading scheme Chemistry concepts and problem-solving skills are not easy to learn, thus the grading policy rewards students for keeping up with the material via homework and group quizzes, as well as two grading options for the exams (details immediately below). Note that both grading options for the exams give more weight to the final exam than to a midterm exam.

Exams comprise 70% of your overall course grade, and will be automatically calculated as the higher score between these options:

Option 1: All 3 midterms, 15% each; final exam, 25%; Total exam score = 70%

Option 2: Best 2 midterms, 15% each; final exam, 40%; Total exam score = 70%

Each student will receive an estimated midterm grade before the withdraw deadline, and final course grades at the end of the semester are posted only on LOCUS. In accordance with departmental standards, the average course grade is usually between C+ and B- at the end of the semester. All scores will be visible in the ALEKS and Sakai Gradebooks. Grades are only based on the criteria listed in this syllabus: no substitutes, no additional criteria will be considered for your

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scores. Please let me know what I can do to help you achieve your desired level of success in this course. ALEKS, and Quizzes are all designed to help you!

ALEKS

Online, at www.aleks.com, due SunTuesThurs at 11:59 pm as pre-lecture objectives. Assessments or “Knowledge Checks” are also automated in the system to help you remember course content throughout the entire semester. Chemistry is a complex and challenging subject, so I have chosen ALEKS to make sure you master the basic, fundamental concepts in the course to fully advance your personal educational and career goals. We have solid data that show this service can improve mastery and retention, particularly for students who would otherwise have difficulty passing. ALEKS will help you by finding out YOUR individual state of knowledge, and then tutoring you in only the topics on which YOU need to work. The final outcome, the list of topics to be mastered, has been set for the course, and it is the same for everybody. But YOUR individual path, how you will get from your present state of mastery to that ultimate goal, is going to be unique to you. No other student will have exactly the same experience. What you must do is decide to trust the system when it assigns you work: trust that this is indeed the work you should be doing now, and that doing it diligently will build the essential mastery you need to succeed in chemistry as fast as possible. ALEKS is worth 15% of your Course Grade. The 15% is distributed as follows: 50% Intermediate Objectives and 50% Final pie mastery. You can find additional [ALEKS info and tips on Sakai](#).

Group Quizzes

Quizzes include exam-level long-answer problems and are completed in discussion, in small groups assigned by the instructor. Quiz work must reflect efforts of ALL group members: the purpose of the quizzes is to foster cooperation and communication between students and the instructor, to help you learn the material. If you struggle with any part of a question in the group session, get help as needed and keep practicing working problems (studying!) until you can solve similar and related problems from the textbook well enough to achieve the exam scores you desire (this will be different for each of you). Quizzes are worth 10% of your course grade, calculated from the average of your best ten scores. This grading policy is designed to account for an unavoidable absence (illness, emergency, etc).

EXAMS

Exams will consist of multiple-choice and long-answer questions.

Midterms: 50 minutes, Sep 22, Oct 30, Nov 27. If you miss a midterm *for any reason*, Option 2 (see grading) will be used to determine your grade. A second missed midterm will result in a score of zero counted in your course grade. It is in your best interest to prepare for and take all exams. Final: 2 hours, Thursday Dec 14, 9-11 am. *Mandatory: a missed final exam will result in a course grade of F.* The final exam must be taken [on the date scheduled](#) per College of Arts and Sciences policy. Exams are completed individually, and only midterm exams will be returned to students, with copies kept by the instructor.

Content

A tentative schedule is given here and on Sakai, ***subject to change***. We will cover roughly Chapters 11-17, 19-20 during the semester. We will begin with Chapter 11 on the first day of class, but not all textbook sections will be fully covered, so focus first on the material that is directly covered in lecture and assigned for homework, quizzes and recommended problems.

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ALEKS Due dates	Class Dates	Class Problems	Comments
Sun Aug 27	Mon Aug 28	Ch 11 Liquids Intermolecular Forces Sections 11.1-2: Prob: 11.4, 11.43, 11.47	Guest Lecture
Tue Aug 29	Wed Aug 30	Ch 11 Liquids Intermolecular Forces Sections 11.4: Prob: 11.74	Guest Lecture
Thu Aug 31	Fri Sept 1	Ch 11 Liquids Intermolecular Forces Sections 11.5: Prob: 11.84, 11.85, 11.96	Guest Lecture
Sun Sept 3	Mon Sept 4		Labor Day No Class
Tue Sept 5	Wed Sept 6	Ch 12 Solids Sections 12.1-12.3 Prob: 12.25, 12.27, 12.31, 12.35, 12.39	
Thu Sept 7	Fri Sept 8	Ch 12 Solids Sections 12.4-12.5 Prob: 12.51, 12.59, 12.63, 12.111	
Sun Sept 10	Mon Sept 11	Ch 12 Solids Sections 12.7 Prob: 12.75, 12.79, 12.100	
Tue Sept 12	Wed Sept 12	Ch 13 Properties of Solutions Sections 13.1-13.2: Prob: 13.25 and 13.27	
Thu Sept 13	Fri Sept 15	Ch 13 Properties of Solutions Sections 13.3-13.4 Prob: 13.37, 13.39, 13.49, 13.53	
Sun Sept 17	Mon Sept 18	Ch 13 Properties of Solutions Sections 13.4-13.5 Prob: 13.75, 13.65, 13.67, 13.69, 13.77	
Tue Sept 19	Wed Sept 20	Ch 13 Properties of Solutions Sections 13.5-13.6 Prob: 13.98, 13.103	
Thu Sept 21	Fri Sept 22		EXAM I
Sun Sept 24	Mon Sept 25	Ch 14/21 Chem and Nuclear Kinetics Sections 14.1-14.2 Prob: 14.3, 14.19, 14.21	
Tue Sept 26	Wed Sept 27	Ch 14/21 Chem and Nuclear Kinetics Sections 14.3-14.4 Prob: 14.45-14.49	
Thu Sept 28	Fri Sept 29	Ch 14/21 Chem and Nuclear Kinetics Sections 21.1-21.2 Prob: 12.13, 12.21	
Sun Oct 1	Mon Oct 2	Ch 14/21 Chem and Nuclear Kinetics Sections 21.3-14.5 Prob: 21.37, 21.41, 21.43, 14.9, 14.59, 14.61, 14.63, 14.130	
Tues Oct 3	Wed Oct 4	Ch 14/21 Chem and Nuclear Kinetics Sections 14.6-14.7 Prob: 14.67	
Thur Oct 5	Fri Oct 6	Ch 15 Chem Equilibrium Sections: 15.1-15.2 Prob: 15.13, 15.15	
Sun Oct 8	Mon Oct		No Class/Early Alerts
Tue Oct 10	Wed Oct 11	Ch 15 Chem Equilibrium Sections: 15.3-15.4 Prob: 15.27, 15.21	
Thu Oct 12	Fri Oct 13	Ch 15 Chem Equilibrium Sections: 15.5-15.6 Prob: 15.35, 15.33, 15.41, 14.47, 14.45, 15.59	
Sun Oct 15	Mon Oct 16	Ch 15 Chem Equilibrium Sections: 15.6-15.7 Prob 15.61, 15.93, 15.85, 15.82	
Tue Oct 17	Wed Oct 18	Ch 16 Acid Base Equilibria Sections: 16.1-16.3 Prob: 16.15, 16.17, 16.21, 16.29, 16.31	
Thu Oct 19	Fri Oct 20	Ch 16 Acid Base Equilibria Sections 16.4-16.5 Prob: 16.35, 16.37, 16.43, 16.45, 16.100	
Sun Oct 22	Mon Oct 23	Ch 16 Acid Base Equilibria Sections 16.6-16.7 Prob: 16.53, 16.55, 16.59, 16.65, 16.71, 16.73, 16.119	
Tue Oct 24	Wed Oct 25	Ch 16 Acid Base Equilibria Sections 16.8-16.9 Prob: 16.75, 16.77, 16.83, 16.81, 16.109	
Thu Oct 26	Fri Oct 27	Ch 16 Acid Base Equilibria Sections 16.10-16.11 Prob: 16.87, 16.89, 16.97	
Sun Oct 29	Mon Oct 30		EXAM 2
Tue Oct 31	Wed Nov 1	Ch 17 Additional Aspects of Aqueous Equilibria	

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Thu Nov 2	Fri Nov 3	Ch 17 Additional Aspects of Aqueous Equilibria Sections 17.1	Prob: 17.15, 17.17	Last Day to Withdraw
Sun Nov 5	Mon Nov 6	Ch 17 Additional Aspects of Aqueous Equilibria Section 17.2	Prob: 17.19, 17.23, 17.27, 17.29	
Tue Nov 7	Wed Nov 8	Ch 17 Additional Aspects of Aqueous Equilibria Section 17.3	Prob: 17.3, 17.41, 17.45	
Thu Nov 9	Fri Nov 10	Ch 17 Additional Aspects of Aqueous Equilibria Section 17.4	Prob: 17.53, 17.55, 17.61	
Sun Nov 12	Mon Nov 13	Ch 17 Additional Aspects of Aqueous Equilibria Section 17.5	Prob: 17.67, 17.97	
Tue Nov 14	Wed Nov 15	Ch 17 Additional Aspects of Aqueous Equilibria Section 17.6	Prob: 17:102	
Thu Nov 16	Fri Nov 17	Ch 19 Chem Thermodynamics Sections 19.1-19.2	Prob: 19.23, 19.27	
Sun Nov 19	Mon Nov 20	Ch 19 Chem Thermodynamics Sections 19.3-19.4	Prob: 19.29, 19.39, 19.51	
Tue Nov 21	Wed Nov 22			Thanksgiving
Thu Nov 23	Fri Nov 24			Thanksgiving
Sun Nov 26	Mon Nov 27			EXAM 3
Tue Nov 28	Wed Nov 29	Ch 19 Chem Thermodynamics Sections 19.5	Prob: 19.57, 19.73, 19.59, 19.69	
Thu Nov 30	Fri Dec 1	Ch 19 Chem Thermodynamics Sections 19.6-19.7	Prob: 19.79-19.83	
Sun Dec 3	Mon Dec 4	Ch 20 Electrochem Sections 20.1-20.2	Prob: 20:23, 20.25, 20.15, 20.19	
Tue Dec 5	Wed Dec 6	Ch 20 Electrochem Sections 20.5	Prob: 20.51, 20.53, 20.57	
Thu Dec 7	Fri Dec 8	Ch 20 Electrochem Sections 20.4&20.6	Prob: 20.37, 20.39, 20.65, 20.69, 20.71	
		Sections	Last Day of Class	
Thu Dec 14	9-11 a.m.			FINAL EXAM