

Chemistry 106X - Spring 2017

General Chemistry



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Class: TR 6:00-7:30
Classroom: Reichardt 201
Office Hours: MWF: 1-3 pm or by appointment

Course materials

The following materials are *required* for the course and can be purchased in the UAF bookstore or elsewhere:

- *Chemistry* 12th Ed. by Chang and Goldsby.
Published by McGraw Hill
ISBN 978-0-073-40268-0
- McGraw-Hill ConnectPlus access for *Chemistry* 12th Ed.
- TurningPoint Technologies ResponseCard RF radio frequency clicker (new or used) or TurningPoint smartdevice app (Code:UAFACCT)
- Experiments in General Chemistry 106X: A Laboratory Manual
(free! print from Blackboard and updated weekly)
- A non-programmable non-graphing scientific calculator is required for each exam. The Department of Chemistry and Biochemistry does not provide calculators for exams, the student *must* provide their own. A ~\$10 calculator that has the standard arithmetic keys as well as 10^x , LOG, EXP or e^x , LN and x^y functions is sufficient. Programmable calculators are not permitted.

The following materials are *optional* and may assist the student in their studies:

- American Chemical Society (ACS) General Chemistry Study Guide
- *Chemistry* 12th Ed. *Student Solutions Manual* by Cruickshank
- *Chemistry* 12th Ed. *Student Study Guide*
- *Essential Algebra for Chemistry Students* 2nd Ed. by Ball

Who should take this course?

Chemistry is a wonderful science that encompasses a broad range of areas, from understanding the functional process of biological systems to determining the mechanisms that underlie geological

phenomena in the earth's crust. This course is intended for students who are interested in enriching their lives with chemistry and enhancing their critical thinking skills. The study of chemical science is valuable in not only fulfilling UAF's core science credits, but also in introducing students to proper laboratory techniques as well as challenging a student's critical thinking. Chemistry 106X is the second semester of a two-semester series in general chemistry, emphasizing the quantitative and mathematical analysis of chemical phenomena.

Course expectations and outcomes

Students are expected to attend class, attendance will be monitored from in class responses and participation points will be given. Each day *before* class the student should read and digest the portion of the textbook appropriate as per the class schedule, including example questions. There is a large amount of material that will be covered throughout the semester, so the class will move fairly quickly in order to cover everything. Clickers and nonprogrammable calculators should be brought to class every day. Students are also expected to attend and participate in lab each week. Completion of fewer than 8 lab reports will result in failure of the course regardless of his/her exam grades and other scores.

Supplementing the course catalog, the course goals are to continue to build the student's skills solving chemical problems, reading critically, formulating questions, completing laboratory experiments and communicating information assimilated throughout the course by completing exams. Class conduct should be professional as well as respectful of the rights other students to constructive learning experience.

Grading

Grades will be posted to blackboard, which can be accessed from the UAF homepage. Class and/or student grades may be adjusted (curved) from the following schedule only in the students' favor. Tentative Points and Letter Grades:

	Points	Grade Range	Letter Grade	
Examination 1	100	100 - 90%	A	1000-900
Examination 2	100	89 - 80%	B	899-800
Examination 3	100	79 - 70%	C	799-700
Final Examination	100	69 - 60%	D	699-600
Lab and Groupwork	200	59% or less	F	<599
Homework	250			
Lecture Quizzes	100			
Class Participation	50			
Total	1000			

Important Dates

Monday, Jan. 16	Alaska Civil Rights Day (No Classes)
Friday, Jan. 27	Last day for student and faculty initiated drops (100% refund of tuition and fees)
Tuesday, Feb. 7	Exam 1
Thursday, Mar. 9	Exam 2
Mar. 13-17	Spring Break (No Classes)
Friday, Mar. 31	Last day for student and faculty initiated withdrawals (W grade on transcript)
Friday, Apr. 21	Spring Fest (No Classes)
Thursday, Apr 13	Exam 3
Thursday, May 4	Final Exam (5:45-7:45 pm)

Instructor Withdrawals

The instructor reserves the right to drop any student from class if that student has missed an exam without an excused absence, has missed more than two labs, appears to be failing as of January 27, 2017, or has many zeros for class participation grades. Students may be notified via email before the drop, if the student corrects the deficiency, the student may remain in this class. Additionally, progress reports for freshman students are due to the Registrar's Office by February 19, 2017. The grade reported at that time will be based on the students' scores on the first exam, homework and the in-class participation grade. The last day for instructor initiated withdrawal is March 31, 2017 (W grade appears on academic record). An incomplete grade will only be assigned if a student misses the final exam for an outstanding reason, such as a medical problem, a death in the family, etc.

Homework

Homework problems are assigned using end of chapter questions from the textbook in coordination with the McGraw-Hill Connect program. Students should expect roughly 25 homework problems from the book to be assigned each week. Homework assignments for the week will be available on Tuesdays at midnight and previous homework's due Tuesdays at 9 pm on the Connect system clock. It is recommended that students promptly register and log in to Connect through Blackboard as homework will be assigned within the first class period.

Quizzes

In order to keep students engaged in the classroom activities as well as ensure retention of a chapter's topics, quizzes will be assigned. Each student must obtain a radio frequency clicker or smartphone app (see above), which is used in lecture to answer questions. Clicker numbers *must* be registered online in the Blackboard system to receive grades as responses are recorded electronically by the TurningPoint receiver and software on the classroom computer. No answers on paper will be accepted after the first two quizzes, any student found using any clicker other than their own will be in violation of the UAF honor code (see below). The quiz questions are likely to be similar to assigned homework problems. Students should come prepared to class with any materials needed for the quizzes and sharing of materials between student is not permitted, but the quizzes are open book and open note.

Laboratory

Weekly laboratories help solidify concepts and gain hands on experience investigating chemical principles and theories. Students will gain skills in scientific reasoning, experimental design, use of chemicals, as well as proper waste disposal techniques laboratory apparatus. Procedures for the weekly lab will be available for printing on Blackboard before the start of the lab section. Lab reports are due the following week and graded by the laboratory assistant, attendance in lab is *mandatory* for credit. The laboratory portion of the student's grade will be based upon the average of the student's best 10 lab reports. Students may miss one lab with no impact on their lab grade, lack of attendance or failure to complete 8 laboratories will result in a *failing* grade for the course. If the student has special scheduling problems please discuss alternative options with Emily Reiter, Laboratory Director. Late reports may be accepted with penalized scores, excluding the last report of the semester which will not be accepted late. **The first lab of the semester includes a safety review and must be attended in order to continue in the course.**

Exams

The student is responsible for all information from text, lecture, homework, quizzes and assigned study questions. Any of these sources will be used to construct exams questions. No use of a cell phone, pda, graphing calculator or otherwise will be allowed during the exam. Three one hour exams and a cumulative final exam will be given as per the course and UAF finals schedule. The final exam will be a *curved* two hour 70 item multiple choice exam provided by the American Chemical Society Examinations Institute. The recommended review text (see above) is an excellent source of information assist students in practicing and preparing for the final exam.

Absences

Make up examinations at Testing Services will be allowed for legitimate absences only, an unexplained absence from an exam results in a zero. If the student anticipates an absence (intercollegiate sports, travel for military or university business) talk to the professor *before* the exam. If the absence is unexpected (illness, family or personal calamity) talk with the professor at the earliest possible opportunity. Please note that makeup exams require the student to have *no* knowledge of the original exam. No extensions, makeup or late work will be accepted otherwise, however homework and clicker grades will receive a 20% buffer for any missed assignments to be utilized by the student at their discretion.

Ethical considerations

The Chemistry and Biochemistry Department *Policy on Cheating* states the following:

Any student caught cheating will be assigned a course grade of F. The student's academic advisor will be notified of this failing grade and the student will not be allowed to drop the course.

Examples of cheating include, but are not limited to:

- Copying another student's answer while taking a quiz or exam
- Copying another student's answer in response to in-class questions
- Using another student's clicker for any reason
- Using another student's work while writing lab reports

Students must also adhere to UAF policies, the student code of conduct as well as the University of Alaska *Honor Code* which states in part:

Students will not collaborate on any quizzes, in-class exams, or take-home exams that will contribute to their grade in a course, unless permission is granted by the instructor of the course. Only those materials permitted by the instructor may be used to assist in quizzes and examinations.

Students will not represent the work of others as their own. A student will attribute the source of information not original with himself or herself (direct quotes or paraphrases) in compositions, theses, and other reports. No work submitted for one course may be submitted for credit in another course without the explicit approval of both instructors. Violations of the Honor Code will result in a failing grade for the assignment and, ordinarily, for the course in which the violation occurred. Moreover, violation of the Honor Code may result in suspension or expulsion.

Student success

There are a large number of resources to help students who would like to perform at their best. The student may make an appointment to see the instructor for help. (The instructor will attempt to reply to email questions within 24 hours during the school week.) The Chemistry and Biochemistry Department has established the Chemistry Learning Center (CLC) which offers student led instruction. Students may also see a tutor for additional assistance. Laboratory teaching assistants are available for help during posted office hours.

Disabilities

Students with a physical or learning disability are required to identify themselves to the Disability Services office (<http://www.uaf.edu/disability/>), Email: uaf-disabilityservices@alaska.edu, Phone: 474-5655 or TTY: 474-1827, located in room 208 in the Center for Health and Counseling. The student must provide documentation of the disability. Disability Services will then notify the instructor of special arrangements for taking tests, working homework assignments, and doing lab work.

Tentative outline and calendar

Week	Date	Ch.	Lesson	Topic	HW	Lab Experiment
1	Jan-17 Jan- 19	11 11 11	11.1-11.5 11.6-11.9 (Quiz)	<i>Molecular theory Solids and liquids</i>	Ch 11- Open	No lab
2	Jan-24 Jan-26	12 12 12	12.1-12.4 12.4-12.8 (Quiz)	<i>Solutions and their properties</i>	Ch11 Closed, Ch12 Open	Review, Intermolecular forces
3	Jan-31 Feb- 2	13 13 13	13.1-13.3 13.4-13.6 (Quiz)	<i>Chemical kinetics and rate laws</i>	Ch 12 Closed, Ch 13 Open	Ten solutions and ten unknowns
4	Feb-7 Feb-9	-- 14	Review Exam 1 14.1-14.2	<i>Equilibrium preview EXAM 1</i>	Ch 13 Closed, Ch 14 Open	Silver plate photography
5	Feb-14 Feb-16	14 14 15	14.3-15.2 (Quiz) 15.3-15.7	<i>Chemical equilibrium</i>	Ch 14 Closed, Ch15 Open	Kinetics of blue dye oxidation
6	Feb-21 Feb-23	15 15 16	15.8- 15.12 (Quiz) 16.1-16.2	<i>Acid/base strength</i>	Ch 15 Closed, Ch 16 Open	Keq
7	Feb-28 Mar-2	16 16	16.3-6.6 16.7-16.9	<i>Acid/base equilibrium</i>	Ch 16 Closed	Acid/Base Week 1
8	Mar-7 Mar-9	16 16 -- --	16.10- 16.11 (Quiz) Review Exam 2	<i>Equilibria and Solubility EXAM 2</i>		Acid/Base Week 2
-	-	-	Spring break	-		-
10	Mar-21 Mar 23	17 17	17.1-17.4 17.5-17.7 (Quiz)	<i>Entropy and Free Energy</i>	Ch 17 Open,	Hydrolysis of salts and behavior of buffers
11	Mar-28 Mar-30	18 18	18.1-18.3 18.4-18.6	<i>Electrochemistry</i>	Ch 17 Closed, Ch 18	Thermodynamics and solubility of borax

					Open	
12	April-4 April-6	18 18 19	18.7-19.2 (Quiz) 19.3-19.5	<i>Nuclear Chemistry</i>	Ch 18 Closed, Ch 19 Open	Voltaic cells and free energy
13	Apr-11 Apr-13	19 19 -- --	19.6-19.8 (Quiz) Review Exam 3	<i>Nuclear Chemistry contd. EXAM 3</i>	Ch 19 Closed	Nuclear chemistry
14	Apr-18 Apr-20	20 23	20.3-20.8 23.1-23.4 (Quiz)	<i>Atmospheric chemistry & Transition metal properties</i>	Ch 20- 24 Open	<i>TBD</i>
15	Apr-25 Apr-27	23	23.4-23.5 24.1-24.4 (Quiz)	<i>Organic Chemistry</i>		<i>Review</i>
-	May-1	20	Review		Ch 20-24 Closed	
-	May-4	-	Final Exam	5:45-7:45pm		-