

# Chemistry 106X - Fall 2016

## General Chemistry



Instructor: Dr. S. Ryan Oliver  
Office: Reichardt 182  
Email: [sroliver@alaska.edu](mailto:sroliver@alaska.edu)  
Phone: 474-5621

Lecture Period: MWF 11:45am-12:45pm  
Classroom: Reichardt 201  
Office Hours: MW 9-11am 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.  
Complete Book - ISBN 978-0-07-802151-0
- McGraw-Hill ConnectPlus access for *Chemistry* 12th Ed.
- TurningPoint Technologies Response – See Blackboard for registration instructions
- Experiments in General Chemistry 106X: A Laboratory Manual  
(free! Handouts can be printed from Blackboard, 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 will meet the needs of this course as long as it has standard arithmetic keys as well as 10x, LOG, EXP or ex, LN and xy functions.
- A University of Alaska email address is required for all communication in the class. This also provides access to the Blackboard system for individual scores and grades.

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*
- *Chemistry* 12th Ed. *Student Study Guide*
- *Essential Algebra for Chemistry Students* 2nd Ed. by Ball

## Important Dates

Monday, Sept. 5	Labor Day (No Class)
Friday, Sept. 9	Last day for student and faculty initiated drops (100% refund of tuition and fees)
Fri, Sept. 23	Exam 1
Mon, Oct. 24	Exam 2
Fri, Nov. 4	Last day for student and faculty initiated withdrawals (W grade on transcript)
Th-Sun, Nov 24-27	Thanksgiving Break
Monday, Nov 21	Exam 3
Dec 14 10:15am-12:15pm	Final Exam

## Who should take this course?

The course is intended for students who are interested in enriching their lives with chemistry. The study of chemical science is valuable from an academic standpoint, fulfilling UAF's core science credits, as well as

introducing students to proper laboratory techniques. Chemistry 106X is the second semester of a two-semester series in general chemistry, emphasizing the quantitative and mathematical identification of chemical phenomena.

## Course expectations and outcomes

Students are expected to attend class; attendance will be monitored from in class responses. Each day *before* class the student should read and digest the portion of the textbook appropriate as per the class schedule, including example questions. *Active learning* involves the student using their sensory motor cortex (sight, smell, sound, taste and touch) in addition to their intelligence, to solidify through practice a concept the student has just read or heard about. Supplementing the course catalog, the course goals are to continue 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 grades may be adjusted (curved) from the following schedule only in the students' favor.

	Points	Grade Range	Letter Grade	Points
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	150	69 - 60%	D	699-600
Lab and Groupwork	250	59% or less	F	< 600
HW, Pre-lecture work	160			
Lecture Quizzes	100			
Participation and Clicker	40			
Total	1000			

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 Friday, September 9, 2016, or has many zeros for class participation grades. Students will be notified once via email before the drop; if the student corrects the deficiency, the student may remain in this class. Progress reports for freshman students are due to the Registrars Office by Sunday, Oct. 2, 2016. The grade reported at that time will include the student's scores on the first exam, homework and the in-class participation grade. The last day for instructor initiated withdrawal is Friday, November 4, 2016 (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 will be assigned using questions from the textbook in coordination with the Connect-Plus program. Students should expect between 10-20 questions to be assigned each week. Homework assignments for the week will be due according to the course schedule below no later than 11:45pm (start of class). It is recommended that students promptly register and log in to Connect-Plus as homework will be assigned within the first class period.

\* Occasionally, students experience problems using Connect. For example, students may type in a right answer, but Connect will count their answer as wrong. Or, perhaps a student cannot open Connect on his or her

particular laptop for some unknown reason. If a student experiences any “electronic” problems using Connect, the student must contact Connect at **1-800-331-5094** for help. The Connect technicians are usually able to resolve the problem. However, if the problem is still not resolved, then the student should contact Dr. Oliver with the case number given by the Connect technician. Dr. Oliver will then notify the Connect sales team of the problem and give them the case number so that the problem can be resolved.

## Quizzes/Worksheets

Each student must obtain a radio frequency clicker (see above), which is used in lecture to answer questions projected on the overhead. 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 unless specified; 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 and are designed to help prepare for exams as well as the ACS final. Students should come prepared to class with any materials needed for the quizzes, as the quiz may be open book or open note or require a calculator. However, sharing of class materials will not be permitted. Quizzes will occur the last lecture period for each chapter and consist of 5 questions worth a total of 10 points, 3 minutes for each question. Answers will be collected through the use of clickers. A total of 11 quizzes will be given throughout the semester and the highest 10 scores will be tabulated (dropping lowest score).

\*If a student misses an in-class clicker quiz and is concerned about losing points, then that student should see Dr. Oliver about making up the quiz. Dr. Oliver will assign textbook problems similar to the quiz problems to the student and the student must solve the problem immediately on a sheet of paper and turn in the answer. The student will receive points if and only if the answers are correct.

## Laboratory

The purpose of lab is to do hands-on investigation of chemical principles and theories. Students will gain skills in scientific reasoning, experimental design, and use of chemicals as well as laboratory apparatus. Laboratory procedures will be available for printing on blackboard before the start of the lab section. Small group learning assignments will also accompany laboratory and account for a portion of the lab grade. Lab reports must be turned in the following week to be graded by the laboratory assistant, attendance in lab is *mandatory* for report 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.

## 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 exam 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 schedule. The final exam will be a curved two-hour 70 item multiple-choice exam provided by the American Chemical Society Examinations Institute. **All students are required to take this exam in order to pass the course.** The recommended review text (see above) is an excellent source of information assist students in practicing and preparing for the final exam. This final examination will also test for some concepts covered in Chem F105X.

## 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), contact 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 grades will receive a 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:

*Any student caught cheating will be assigned a course grade of F. The students 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
- 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:

*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, 474-7043, located 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 course outline and calendar**

## UAF CHEM F106X Syllabus

Fall 2016

Oliver

Week	Date	Ch.	Lesson	Assignments	Topic	Lab Experiment
1	Aug 29 Aug 31 Sept 2	11 11 11	11.1-11.2 11.2-11.5 11.6-11.9 (Quiz)	HW11 Open	<i>Kinetic Molecular Theory Nomenclature and intermolecular forces</i>	-
2	Sept 5 Sept 7 Sept 9	- 12 12	- No class - 12.1-12.3 12.3-12.6	<b>HW11 Due</b> , HW12 Open	<i>Solutions and their properties</i>	1. Review, IMF
3	Sept 12 Sept 14 Sept 16	12 13 13	12.6-12.8 (Quiz) 13.1-13.2 13.3-13.4	<b>HW12 Due</b> , HW13 Open	Solutions Chemical Kinetics and Rate Laws	2. Ten solutions and ten unknowns
4	Sept 19 Sept 21 Sept 23	13 - -	13.5-13.6 (Quiz) Review <b>Exam 1</b>	<b>HW13 Due</b>	<i>Rate laws</i> <b>Exam 1</b>	3. Silver plate photography
5	Sept 26 Sept 28 Sept 30	14 14 15	14.1-14.2 14.3-14.5 (Quiz) 15.1-15.4	HW14 Open	<i>Equilibrium</i>	4. Kinetics
6	Oct 3 Oct 5 Oct 7	15 15 15	15.5-15.7 15.8-15.10 15.10-15.12 (Quiz)	<b>HW14 Due</b> , HW15 Open	<i>Chemical Equilibrium Acids and Bases</i>	5. Keq
7	Oct 10 Oct 12 Oct 14	16 16 16	16.1-16.2 16.3-16.5 16.6-16.7	<b>HW15 Due</b> , HW16 Open	<i>Acid/base strength and Equilibria</i>	6. Acid/Base Week 1
8	Oct 17 Oct 19 Oct 21	16 16 -	16.8-16.9 16.10-16.11 (Quiz) Review	<b>HW16 Due</b>	<i>Equilibria and Solubility</i>	7. Acid/Base Week 2
9	Oct 24 Oct 26 Oct 28	- 17 17	<b>Exam 2</b> 17.1-17.2 17.3-17.4	HW17 Open	<b>Exam 2</b> <i>Entropy, Free Energy, and Equilibrium</i>	8. Salts and Buffers
10	Oct 31 Nov 2 Nov 4	17 18 18	17.5-17.7 (Quiz) 18.1-18.2 18.3-18.4	<b>HW17 Due</b> , HW18 Open	<i>Free Energy and Equilibrium Electrochemistry</i>	9. Thermo/Borax
11	Nov 7 Nov 9 Nov 11	18 18 19	18.5-18.6 18.7-18.8 (Quiz) 19.1-19.3	<b>HW18 Due</b> , HW19 Open	<i>Electrochemistry Nuclear Chemistry</i>	10. Voltaic Cells and Free Energy
12	Nov 14 Nov 16 Nov 18	19 19 -	19.3-19.6 19.6-19.8(Quiz) Review	<b>HW19 Due</b>	<i>Nuclear Chemistry</i>	11. Nuclear Chem
13	Nov 21 Nov 23 Nov 25	- - -	<b>Exam 3</b> -NO CLASS- -NO CLASS-	Thanksgiving Holiday	<b>Exam 3</b>	No Lab
14	Nov 28 Nov 30 Dec 2	20 23 23	20.3-20.8 23.1-23.2 (Quiz) 23.2-23.3	HW20 Open HW23 Open	<i>Chemistry in the Atmosphere, Coordination Compounds</i>	TBD
15	Dec 5 Dec 7 Dec 9	24 - -	23.3-23.5 24.1-24.4 (Quiz) Review	<b>HW 20 Due</b> HW 24 Open <b>HW 23 Due</b>	<i>Coordination Compounds Organic Chemistry</i>	Review
	Dec 12 Dec 14	- -	Review for Final Final Exam	<b>HW 24 Due</b>	<b>FINAL EXAM</b> <b>Dec 14</b> <b>10:15am-12:15pm</b>	No Lab