Chemistry 106X - Fall 2019

General Chemistry

Instructor:	Dr. S. Ryan Oliver	Lecture Period:	MWF 11:45am-12:45pm
Office:	REIC 182	Classroom:	Reichardt 201
Email:	sroliver@alaska.edu	Office Hours:	W 9-11am
Phone:	474-5621		or by Appointment

Course materials

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

- *Chemistry: An Atoms-Focused Approach* , 2nd edition, Gilbert et al.
  Complete Book - ISBN 978-0-393-28421-8 (Hardcover), Soft cover also available at bookstore
- Norton Smartwork 5 access for *Chemistry: an atoms-focused approach,* 2nd 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 10*x*, LOG, EXP or e*x*, LN and x*y* 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 2nd edition
- *Essential Algebra for Chemistry Students* 2nd Ed. by Ball

Important Dates

Monday, Sept. 2	Labor Day (No Class)
Friday, Sept. 6	Last day for student and faculty-initiated drops (100% refund of tuition and fees)
Mon, Sept. 23	Exam 1
Mon, Oct. 18	Exam 2
Fri, Nov. 1	Last day for student and faculty-initiated withdrawals (W grade on transcript)
Th-Sun, Nov 28-Dec 1	Thanksgiving Break
Monday, Nov 20	Exam 3
Dec 13, 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 105X is the first semester of a two-semester series in general chemistry, emphasizing the quantitative and mathematical identification of chemical phenomena.
Corequisites: ENGL 111X and MATH 107X

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
Quizzes	100			
Homework	150			
Participation and Clicker	50			
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 6, 2019, 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 Monday, Oct. 7, 2019. 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 1, 2019 (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 Smartwork 5 program. Students should expect between 15 questions to be assigned each week with additional adaptive learning objectives. Homework assignments for the week will be due according to the course schedule below no later than 1pm (start of class). It is recommended that students promptly register and log in to Smartwork5 as homework will be assigned within the first class period.

Quizzes/Worksheets

Each student must obtain a radio frequency clicker (see above) or download the Turning Technologies app, which is used in lecture to answer questions projected on the overhead. Either option can be used but students must purchase a Cloud registration code if not obtaining a combo from the bookstore. 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.

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 with- out 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

Week	Date	Ch.	Lesson	Assignments	Topic	Laboratory
1	Aug 26 Aug 28 Aug 30	11 11 11	11.1-11.2 11.3-11.4 11.5-11.6		*Properties of Solutions*	No Lab
2	Sept 2 Sept 4 Sept 6	- 12 12	- No class - 12.1-12.3 (Quiz) 12.3-12.6	**HW1 Due**	*Thermodynamics*	1: Ten Solutions Ten Unknowns
3	Sept 9 Sept 11 Sept 13	12 13 13	12.6-12.8 13.1-13.2 (Quiz) 13.2-13.4	**HW2 Due**	*Chemical Kinetics*	2: Enthalpy
4	Sept 16 Sept 18 Sept 20	13 13 -	13.4-13.5 13.5-13.6 Review (Quiz)	**HW3 Due**	*Chemical Kinetics*	3: Kinetics
5	Sept 23 Sept 25 Sept 27	 14 14	**Exam 1** 14.1-14.3 14.4-14.6		***Exam 1*** *Equilibrium*	4: Silver Plate Photography
6	Sept 30 Oct 2 Oct 4	14 15 15	14.7-14.10 15.1-15.3 (Quiz) 15.3-15.5	**HW4 Due**	*Acid-Base Equilibria*	5: Keq
7	Oct 7 Oct 9 Oct 11	15 16 16	15.6-15.8 16.1-16.3 (Quiz) 16.4-16.6	**HW5 Due**	*Other Aqueous Equilibria*	6: Acid Base Week 1
8	Oct 14 Oct 16 Oct 18	16 - -	16.6-16.8 Review (Quiz) **Exam 2**	**HW6 Due**	***Exam 2***	7: Acid Base Week 2
9	Oct 21 Oct 23 Oct 25	17 17 17	17.1-17.3 17.3-17.6 17.6-17.8		*Electrochemistry*	8: Salts and Buffers
10	Oct 28 Oct 30 Nov 1	17 18 18	17.8-17.10 18.1-18.3 (Quiz) 18.4-18.6	**HW7 Due**	*The Solid State*	9: Voltaic Cells and Free Energy
11	Nov 4 Nov 6 Nov 8	18 21 21	18.7-18.9 21.1-21.4 (Quiz) 21.4-21.6	**HW8 Due**	*Nuclear Chemistry*	10: Thermo and Borax
12	Nov 11 Nov 13 Nov 15	21 22 22	21.7-21.10 22.1-22.3 (Quiz) 22.4-22.6	**HW9 Due**	*Main Group Elements*	11: Nuclear Chem
13	Nov 18 Nov 20 Nov 22	- - 23	Review (Quiz) **Exam 3** 23.1-23.4	**HW10 Due**	***Exam 3*** *Transition Metals*	12: Aspirin
14	Nov 25 Nov 27 Nov 29	23 - -	23.5-23.8 -NO CLASS- -NO CLASS-	Thanksgiving Holiday	*Transition Metals*	No Lab
15	Dec 2 Dec 4 Dec 6	19 - -	19.1-19.8 (Quiz) Example Problems Review for Final	**HW11 Due** **HW Sem. Review Due**	*Organic Chemistry- Brief* *Examples and Review*	Review
	Dec 13	-	Final Exam	**ACS Final Exam**	***FINAL EXAM*** ***Dec 13*** ***10:15am-12:15pm***	

* Honors sections of lab will have an altered schedule