Chemistry 2070 **Fall 2016**

GENERAL COURSE INFORMATION

Instructors and Office Hours:

Professor **Brian Crane**:	Room 336 Physical Sciences Building, PSB (4-8634, chem2070@cornell.edu)
Office Hours:	Wed. 3:00-4:00 pm; Fri. 3:00-4:00 pm or by appointment **Professor Crane will lecture until Oct. 20th.**
Professor **Kyle Lancaster:**	Room 678A ST Olin (5-0502, chem2070@cornell.edu)
Office Hours:	Wed. 4:45-5:45 pm; Fri. 4:45-5:45 pm or by appointment **Professor Lancaster will lecture from Oct. 25th.**
Laboratory Director Dr. Cynthia Kinsland	Room 131A Baker Lab (5-8844, chem2070@cornell.edu)
Office Hours:	Mon. and Wed. 10-11 am and drop in or by appointment
Course Website	http://blackboard.cornell.edu

Undergraduate Instructional Office: Ms. Pat Hine (5-5287, chem2070@cornell.edu) in **Baker 131** handles all questions concerning entrance to and exit from the course, lecture and laboratory. If you are adding, dropping, or petitioning out of this course, a course change form must be submitted to Ms. Hine for signature. She is authorized to sign for the course instructor on "add" or "drop" forms. The Department of Chemistry and Chemical Biology requires Departmental approval for all course changes. The Instructional Office is open M-F 8:00-4:30.

Lecture Schedule: Lectures are given in Baker 200 at either **10:10-11:00 am** or **12:20-1:10 pm** on Tuesdays and Thursdays. If you arrive late for lecture, do not enter through the doors on the second or third floor halls of Baker. Instead, go to the back of the lobby on the first floor of Baker where, near a bust of a famous former member of this department, you will find two staircases leading to the back of the main floor and balcony of Baker 200.

Laboratory and Recitation Sections: You need to be enrolled in one laboratory and one recitation section! Each will meet weekly and will have different teaching assistants (TAs). Both will begin the week of Monday, August, 29th. You will be assigned to a TA and a laboratory room on the Blackboard Course Site. Bring calculator, laboratory assignment (available on Course Website) and lab notebook to the first session (see Textbooks and Required Materials at the bottom of this sheet). Recitation sections allow you to work on problem-solving skills in a small group setting. **Note that Monday lab sections will be performing an experiment in addition to Check-In on Aug 29th due to the labor day holiday the following week**.

LSC Study Groups: There will be an opportunity to sign up for study groups organized by the Learning Strategies Center (LSC). These groups will meet once a week for one hour with a discussion leader who was recently a student in Chem2070. The purposes of the study groups are to review CHEM 2070 concepts and problem solve in a group environment. Participation in study groups is voluntary. If you are interested in the study groups go to the online survey for planning of times and participation levels. https://cornell.qualtrics.com/SE/?SID=SV_43oBGiZw6flcPaZ

Teaching Assistants: Teaching assistants (TAs) have regularly scheduled office hours. Times and locations will be posted on the course Web page and on the bulletin board around the corner from Baker 131. Office hours will start during the first full week of classes. All regular office hours are open to any student in the course (you need not attend only your lab TA's office hours). The TA mailboxes are located in Baker 131.

Excused Absences and Make-ups: If you must miss a laboratory session because of **illness**, you **must** email both your lab TA and the course mailbox (chem2070@cornell.edu) prior to the start of your lab in order to be excused or schedule a make-up lab, should space be available. If you miss the laboratory for other valid reasons recognized by the University, such as religious holidays, University-sponsored event or crisis in your immediate family, you must see Dr.

Kinsland for an excused absence or Ms. Hine for a make-up session **before** the holiday/event (or upon your return to campus in the event of a family emergency).

Recesses and Travel Plans: There will be no class Labor Day, Monday September 5. Fall Break begins Saturday, October 8th. Instruction resumes Wednesday, October 12. Thanksgiving recess begins ***following lecture period*** at 1:10 pm Wednesday, November 23. **There are no labs M-F Thanksgiving week.** University instruction resumes Monday, November 28. Because of limited space, laboratory/recitation sessions just before and after recesses cannot be excused or rescheduled; travel arrangements should be made accordingly.

Textbooks and Other Materials:

1. Digital Materials: Ebook Of Mcquarrie – General Chemistry & Sapling Homework Manager Product. Hard Copy of *General Chemistry,* 4th ed., by McQuarrie, Rock and Gallogly also available in bookstore.
2. Optional - Solution Manual for even number problems in General Chemistry (Author- Carole McQuarrie).
3. Calculator with logarithms and exponential functions. ***No programmable calculator or calculator capable of displaying text may be used during exams or quizzes.***
4. Laboratory Research Notebook (notebook with carbon paper or carbonless duplicate sets).
5. Ball-point pen.

Items 3-5 above are necessary for the completion of the experiment performed during the first lab session.

Instructions for purchasing Digital Materials:

Online Purchase at The Cornell Store

- Students will go to the Online Booklist / Price Comparison Tool (click here to go directly THERE)
- Under CHEM 2070 the student will see the MCQUARRIE product listed as an EBOOK
- Student will put the EBOOK in their shopping cart and checkout like normal
- The student will receive an Order Summary Email and then after will receive a Status Update Email.
- Within the Status Update email the Redemption Code or the product will be present
- Students will enter the Redemption Code at cornellstore.redshelf.com
- Student will follow instructions on the product to gain access to the Sapling Learning products / eBook

If any students have questions about ordering online they may contact cbsonline@cornell.edu.

Chemistry 1007: The Learning Strategies Center offers Chemistry 1007 (one credit hour, S/U) to help students better understand the concepts presented in the course and improve performance. Chemistry 1007 is taught by Dr. Steve K. Johnson and meets Wednesdays and Thursdays. For more information visit the Chem 1007 website through: http://www.blackboard.cornell.edu. Chem 1007 closely tracks Chem 2070 material.

Chemistry 1070: Chemistry 1070 helps develop student quantitative reasoning skills necessary for success in Chem 2070 and other similar physical sciences courses. 1070 is more demanding than 1007 (two credit hours, S/U) and is well suited for mid-range 2070 students who wish to develop higher-end reasoning skills.

Lecture Notes: Lecture notes will be available on the course Blackboard site.

Homework Problem Sets: Weekly assignments will be given assigned on the Sapling Learning Homework site and announced in class. Problem Sets will be typically released on **Wednesday** morning and then due **9 days later** the following **Friday** evening. Additional ungraded problems for practice will also be assigned on Blackboard for practice, usually from the McQuarrie Chapters, with the answer key posted the following **Friday** (9 days later). Lab Quiz questions will be derived from the Quiz problems in the blackboard assignments.

Weekly Quizzes: At the beginning of each laboratory session you will be given a 20 min quiz closely derived from the assigned homework of the previous Wednesday. The aggregate score on these quizzes will count for 5% of your grade. **Laboratory quizzes will begin the week of Monday Sept. 5th.**

Course Web Site: The Chem 2070 website can be accessed via the link http://www.blackboard.cornell.edu/. You will be automatically enrolled into the Chem 2070 Blackboard site once you are admitted to the course.

Laboratory Reports: There will be ten laboratory experiments requiring brief reports. Each will be worth 100 points, with the cumulative score counting for 20% of your grade. Information concerning lab report requirements can be found on the course website.

Examinations: Preliminary examinations will be held on Tuesday, Oct. 4; and Tuesday, Nov. 15 from 7:30-9:00 p.m. The final exam period begins December 7 and ends December 15. The date and time of the final examination will be announced as soon as the registrar has determined it. Exam locations will be announced in lecture and on the course website. If you have a conflict with any of the examinations contact Ms. Hine as soon as possible. Early exams will be scheduled if such conflicts occur, but no make-up exams will be given and no excused absences will be issued to accommodate travel plans. If your health condition prevents you from taking a prelim exam, you will be granted an excused absence. This means that the missed prelim exam will not count toward your grade, which will be based on your remaining course work. No make-up prelim exams will be given for any reason. If illness prevents you from taking the final exam, and you have notified Ms. Hine, you may be eligible to take a make-up final at the beginning of the Spring semester.

Academic Integrity: *Each student in this course is expected to abide by the Cornell University Code of Academic Integrity. Any work submitted by a student in this course for academic credit will be the student's own work.*

Grading: The course is graded on the percent breakdown as shown below:

Online Homework	5
Lab Quizzes	5
Laboratory Reports	20
Preliminary Examinations (2 @ 20% each)	40
Final Examination	30
Total	100%

Syllabus – Based on *General Chemistry,* 4th ed., by McQuarrie, et al.

Week	Date	Topics	Chapter
	Professor Crane		
1	T Aug 23	Elements, States of Matter, Constant Composition	2.1 – 2.4
	R Aug 25	Naming Cmpds, Experiments that Revealed Atomic Structure	2.5 – 2.7
2	Aug 30	Atomic Structure, Isotopes, Ions	2.8 – 2.12
	Sep 1	Periodic Table, Basic Reactivity, Chemical Eqns	3.1 – 3.7
3	Sep 6	Types of Chemical Reactions, Acids and Bases	10.1 – 10.5
	Sep 8	Displacement and Precipitation Reactions	10.6 – 10.7
4	Sep 13	Redox Reactions, Metal and Halogen Reactivity	10.8 – 10.10
	Sep 15	Oxidation States and Balancing Redox Reactions	24.1 – 24.5
5	Sep 20	The Mole, Molecular Formula, Combustion Analysis	11.1 – 11.6
	Sep 22	Limiting Reagents and Reaction Yields	11.7 – 11.11
6	Sep 27	Molarity, Reactions in Solution, Titrations	12-1 – 12-7
	Oct 29	Gases, The Ideal Gas Law	13.1 – 13.6
7	Oct 4	Partial Pressures, Kinetic Theory of Gases	13.7 – 13.10
	Tues 4	**Prelim 1 7:30-9:00 pm**	
	Oct 6	Enthalpy and Bond Energies	14.1 – 14.5
8	Fall Break		
8	R - Oct 13	Waves, Light and Energy levels of the H-atom	4.1 – 4.9
9	Oct 18	Uncertainty, Schrödinger Equation, Bohr Model	5.1 – 5.5
	Oct 20	Atomic Structure and Periodic Properties	5.6 – 5.12
Professor Lancaster			
10	Oct 25	Where Can The Electrons Go I: Orbital Shapes and Sizes	Handout
	Oct 27	Where Do We Put Electrons: Electronic Configurations	5
11	Nov 1	Interpreting the Periodic Table I: Effective Nuclear Charge	5
	Nov 3	The Table II: Atom Size, Electron Affinity, Electronegativity	5
12	Nov 8	Table Salt and Beyond: Ionic Bonding	6
	Nov 10	Sharing Electrons: Covalent Bonding and Lewis Structures	7, 8
13	Nov 15	Taking Shape: VSEPR	7, 8
	Tues 15	**Prelim 2 7:30-9:00 pm**	
	Nov 17	Where Can the Electrons Go II: Valence Bond Theory	9.5 – 9.13
14	Nov 22	What About Physical Properties: Molecular Orbital Theory	9
	Thanksgiving		

15	Nov 29	Applying Molecular Orbitals: Diatomic Molecules	9
	Dec 1	The Main Group Mastered: MOs of Polyatomic Molecules	9
Dec 9-17		**Final Exam**	