Look for news and information on the General Chemistry website. You can access our home page through the Chemistry Department site at www.clemson.edu/chemistry (go to “Academics,” then “Undergraduate Chemistry Courses,” then “General Chemistry”) or directly via www.clemson.edu/chemistry/genchem. Click the “Lecture” drop down heading and choose “CH 1020.” Course objectives, exam information including dates and lab information are posted on this site.

Required Materials

- Access to Sapling Learning on-line homework system. Instructions for the registration process can be found on the General Chemistry webpage (link is in the previous paragraph).
  - You may purchase access for a single semester directly from Sapling Learning. Alternatively, you may purchase an access code through the Clemson University bookstore.
  - Your access remains valid if you chose the two semester purchase option for CH 1010.
- Non-programmable scientific calculator.
  - Possible models include but are not limited to:
    - Casio: all fx-115 models
    - HP: 33 or 35 models
    - TI: 30X or 36X models
  - If you have a calculator that you think may be acceptable, please ask for clarification. A cell phone is not an acceptable calculator.

Recommended Materials

A textbook is recommended but not required; here are two possible options. Both options were offered for CH 1010 in the fall semester.

  - Two versions are available in the Clemson bookstore (i) new, three-hole punched loose-leaf textbook (ii) used soft cover textbook. You may be able to find a used version on the internet.
- Chemistry OpenStax College.
  - A free etextbook available from Rice University, https://openstax.org/details/chemistry-atoms-first. The chapter ordering is different from that presented in the course but the content is similar. This ebook is an acceptable supplement to the lecture.

Other Materials

- Some instructors use a class response system which requires an iClicker remote. An iClicker2 can be purchased from the Apple Store, which is located in the University Union. Cost is $60 (after tax) and can be paid by Tiger Stripe or credit card (no cash). Note that iclickers may not be required by all instructors.
Class Schedule for CH 1020 Spring 2017

Note: This schedule is tentative and subject to change.

<table>
<thead>
<tr>
<th>CHAPTER</th>
<th>ACTIVITY</th>
<th>50 MIN.</th>
<th>75 MIN.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction to CH 1020</td>
<td>1.0</td>
<td>0.5</td>
<td></td>
</tr>
<tr>
<td>Chap. 12</td>
<td>Thermodynamics (Entropy &amp; Free Energy)</td>
<td>3.0</td>
<td>2.0</td>
</tr>
<tr>
<td>Chap. 11</td>
<td>Properties of Solutions</td>
<td>5.0</td>
<td>3.5</td>
</tr>
<tr>
<td>Chap. 13</td>
<td>Chemical Kinetics</td>
<td>4.0</td>
<td>3.0</td>
</tr>
<tr>
<td><strong>EXAM 1</strong></td>
<td><strong>Monday February 13 (7:15 pm)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chap. 13</td>
<td>Chemical Kinetics (continued)</td>
<td>2.0</td>
<td>1.5</td>
</tr>
<tr>
<td>Chap. 21</td>
<td>Nuclear Chemistry</td>
<td>4.0</td>
<td>3.0</td>
</tr>
<tr>
<td>Chap. 14</td>
<td>Chemical Equilibrium</td>
<td>5.0</td>
<td>3.5</td>
</tr>
<tr>
<td><strong>EXAM 2</strong></td>
<td><strong>Monday March 13 (7:15 pm)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chap. 15</td>
<td>Aqueous Equilibria</td>
<td>7.0</td>
<td>4.5</td>
</tr>
<tr>
<td>Chap. 17</td>
<td>Electrochemistry</td>
<td>4.0</td>
<td>3.5</td>
</tr>
<tr>
<td>Chap. 19</td>
<td>Organic Chemistry</td>
<td>3.0</td>
<td>2.0</td>
</tr>
<tr>
<td><strong>EXAM 3</strong></td>
<td><strong>Monday April 24 (7:15 pm)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>FINAL EXAM</strong></td>
<td><strong>Wednesday May 3 (11:30 am)</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Laboratories: Labs will begin the week of January 23. You must be scheduled for a laboratory section, CH 1021, even if you are repeating the course. Look for an email from the Ms. Lewis, the lab coordinator, with key information regarding your lab section including its location.

- A schedule of laboratory experiments will be issued as a separate syllabus.
- Safety goggles must be worn at ALL times while in the laboratory. Safety goggles may be purchased during the first week of labs from the Chemistry Graduate Student Association. Notices will be posted as to places and times when goggles will be offered for sale. If you purchase goggles from other sources please note that they must be chemical splash goggles that meet ANSI Z87.1 standard safety code.
- If you are repeating the course, but completed lab with a grade of 75 or above, you may exempt lab and let your previous lab score count in computation of your overall class grade. Fill out the lab exemption form on the General Chemistry website (www.clemson.edu/chemistry/genchem) and you will be notified if you are eligible to exempt the lab.

  Note: You will be moved into an exempt lab section, do not drop the lab since this is a four hour course and you must be registered in a lab section to receive credit.

Help: You may obtain extra help from the following sources:

- Peer Assisted Learning (PAL) Sessions—details on the first day of class. Check the Academic Success Center for dates and schedules (www.clemson.edu/asc/).
- Your lecture Instructor: See section syllabus for office hours.
- Drop-in tutoring on the first floor of the ASC building. The Academic Success Center offers FREE drop-in tutoring in a group setting, http://www.clemson.edu/asc/tutoring/.
- Form a study group with other students who are taking CH 1020 (they don’t have to be in your section). It can really help; collaboration improves learning.
Grading Scale: Final grades will be assigned on the following average score range:

- 90% through 100% A
- 80% through 89% B
- 70% through 79% C
- 60% through 69% D
- below 60% F

This average score will be based on the laboratory grade (comment 1), three exams, the final exam (comment 2), class quizzes, homework and class participation. Course grades will be apportioned as shown below:

- Laboratory (comment 1) 25%
- Exams 40% (three exams 13⅓ % each)
- Final Exam (comment 2) 20%
- Class Activities (comment 3) 15%
- Total 100%

Comment 1: You must be registered for a laboratory section. If the lab is not completed (more than one unexcused absence or uncompleted lab), your grade will be reduced significantly.

Comment 2: The Final Exam grade may substitute for your lowest exam grade of the semester if it is to your advantage and you make over 70% on the Final Exam. Unexcused exam absences will not be replaced.

Comment 3: What constitutes “class activities” will vary by instructor and may include such things as homework, quizzes, iclickers and/or other class participation activities. See your instructor’s section syllabus for more information.

Important Notes

1. Exams 1, 2 & 3 are given at 7:15 P.M. on a Monday night. Put the dates and time on your schedule as there will be no rescheduling of exams. The time allotted for the exam and the location of the exam for your section will be communicated by your instructor about one week prior to the exam. Make sure you know where your exam will be given, since it is unlikely that it will be in your usual lecture room. You will be expected to bring your Clemson Student ID card.

2. All exams should be considered comprehensive; previously covered material may be tested. The Final Exam in CH 1020 will be cumulative, covering material from both CH 1010 and CH 1020.

3. No makeup exams will be given for any reason. Students who have conflicts with official university functions must notify their instructor by Friday January 20. Check your commitments to NCAA sports programs, ROTC or other university groups. Pay particular attention to the time of the Final Exam. Students are expected to resolve travel schedule conflicts and attend the Final Exam. If you miss the Final Exam a grade of zero will be recorded.

4. If you require special accommodations for exams, these must be communicated to your instructor via an Academic Accommodation Letter (AAL) at least one week prior to the exam date. The AAL must be presented in person to your instructor outside of class time so that a discussion of the required accommodations can take place. Accommodations will be made no earlier than the date that the AAL is presented to the instructor.
   - If use of the Test Proctoring Center is required, you must schedule a time for your exam at least one week prior to the exam date. It is suggested that you schedule your exams as soon as possible.

5. For an excused absence on any major exam, the weight for that exam will be applied to the Final Exam (this is the fairest way to handle absences for everyone concerned, including the absent student).
Excused absences include documented student illness and family emergencies. If the Final Exam is missed for an excused absence (identified before the time of the final), the student will receive an Incomplete (I) grade in the course and they will be required to make up missed work within 30 days of the beginning of the following semester.

6. If errors occur with your exam grade, see your instructor. NOTE: Most grade problems are due to poor erasures, not using #2 pencil, poorly filled out answers, I.D. number, section number, etc.

7. Each exam will cover the material listed in the objectives posted on the class web site, or as modified in class. Attempts will be made to cover most of these in class. Covered or not, these objectives will be subject to examination. Use your textbook; stay at least a half chapter ahead by reading the text and working the problems.

8. **Resolve Final Exam scheduling issues before finals week.** A student who has more than two exams in one calendar day may request that one of the exams be taken at a different time. The registrar has established a priority as to which course must provide an alternative exam time. The CH 1020 final exam has top priority and cannot be rescheduled. See the registrar’s webpage for additional information, [www.registrar.clemson.edu/html/examSched.htm](http://www.registrar.clemson.edu/html/examSched.htm).

9. Cancelled lectures: If your lecturer is more than 15 minutes late, you can assume that the lecture will be canceled for the day. However, you are still responsible for the material that would have been reviewed during this period. **Check for an email from your instructor regarding the missed material.**

10. The last day to drop the course without a final grade is March 17, four days after the second exam.

11. For other problems - First see your instructor. For general questions, see Ms. Kris Coleman in Hunter 219; email: kcolem3@clemson.edu. If necessary, see the Director of General Chemistry, Dr. Dennis Taylor in Hunter 265; email: dftay@clemson.edu.

**Attendance Policy**

The academic resources of Clemson University are provided for the intellectual growth and development of students. Class attendance is critical to the education process; therefore students are expected to attend class. A student who misses more than four MWF classes (three TR classes) including exams without a valid excuse may be dropped from the course due to excessive absences. The university attendance policy can be found on pages 27-28 of the 2016-2017 Undergraduate Announcements. In case of an emergency, it is the responsibility of the student to make direct contact with his/her instructor preferably before a class or exam takes place.

Any exam that is scheduled at the time of a class cancellation due to inclement weather, power outage, etc. will be given at the earliest possible date, probably the next week. Details will be communicated by your instructor through Blackboard and/or your Clemson email. Any assignments due at the time of a class cancellation will be due the next class meeting unless contacted by your instructor. Any extension or postponement of assignments or exams must be granted by the instructor via email or Blackboard/Canvas within 24 hours of the weather related cancellation.

**Academic Integrity Policy**

"As members of the Clemson University community, we have inherited Thomas Green Clemson's vision of this institution as a "high seminary of learning." Fundamental to this vision is a mutual commitment to truthfulness, honor, and responsibility, without which we cannot earn the trust and respect of others. Furthermore, we recognize that academic dishonesty detracts from the value of a Clemson degree. Therefore, we shall not tolerate lying, cheating, or stealing in any form."

“When, in the opinion of a faculty member, there is evidence that a student has committed an act of academic dishonesty, the faculty member shall make a formal written charge of academic dishonesty, including a description of the misconduct, to the Associate Dean of Undergraduate Studies.
Accessibility Accommodations Policy
Clemson University values the diversity of our student body as a strength and a critical component of our dynamic community. Students with disabilities or temporary injuries/conditions may require accommodations due to barriers in the structure of facilities, course design, technology used for curricular purposes, or other campus resources. Students who experience a barrier to full access to this class should let the professor know, and make an appointment to meet with a staff member in Student Accessibility Services as soon as possible. You can make an appointment by calling 864-656-6848, by emailing studentaccess@lists.clemson.edu, or by visiting Suite 239 in the Academic Success Center building. Appointments are strongly encouraged – drop-ins will be seen if at all possible, but there could be a significant wait due to scheduled appointments. Students who receive Academic Access Letters are strongly encouraged to request, obtain and present these to their professors as early in the semester as possible so that accommodations can be made in a timely manner. It is the student’s responsibility to follow this process each semester. You can access further information here: http://www.clemson.edu/campus-life/campus-services/sds/. Please be aware that a new Academic Access Letter must be presented each semester. These letters are not retroactive and do not take effect until the letter is presented to the instructor.

Clemson University Title IX Statement
Clemson University is committed to a policy of equal opportunity for all persons and does not discriminate on the basis of race, color, religion, sex, sexual orientation, gender, pregnancy, national origin, age, disability, veteran’s status, genetic information or protected activity (e.g., opposition to prohibited discrimination or participation in any complaint process, etc.) in employment, educational programs and activities, admissions and financial aid. This includes a prohibition against sexual harassment and sexual violence as mandated by Title IX of the Education Amendments of 1972. This policy is located at www.clemson.edu/campus-life/campus-services/access/title-ix/. Mr. Jerry Knighton is the Clemson University Title IX Coordinator. He also is the Director of Access and Equity. His office is located at 111 Holtzendorff Hall, (864) 656-3181 (voice) or (864) 565-0899 (TDD).

Prerequisites:
The main prerequisite for CH 1020 is a ‘C’ or better in CH 1010. It is your responsibility to recognize whether or not you meet the perquisite requirement. If you are found to be missing this prerequisite you will be dropped from the course, even if after the final drop date of January 25 or if your removal from the class drops you below 12 enrolled hours.

We assume that you bring the following skills with you from CH 1010 or its equivalent. If you cannot do these, you must quickly learn them by self study. We may give a pretest the first week of classes to test your knowledge of these topics.

Before beginning this course you should be able to:
1. Define, identify, and/or give examples of:
   - chemistry
   - energy
   - solid
   - chemical properties
   - physical change
   - elements
   - molecules
   - matter
   - work
   - gas
   - chemical change
   - pure substances
   - compounds
   - density
   - mass
   - liquid
   - solution
   - physical properties
   - mixtures
   - atoms
   - temperature

2. Make conversions of quantities using dimensional analysis (include units!).
3. Use the rules for significant figures with numbers in calculations.
4. Use the mole concept to interconvert among mass, moles, number of molecules, number of atoms, volume of gas (using gas laws), density and molarity.
5. Write and balance a chemical equation if given the names or formulas of each reactant and product.
6. Define and calculate: theoretical yield, actual yield, percent yield and limiting reagent; and determine which reactant is the limiting reagent.

7. Draw Lewis structures for ionic and covalent compounds and identify bond order (single, double, triple, etc.) covalent bonds in these compounds.

8. Predict relative magnitude of the elemental properties of electronegativity, electron affinity, ionization potential, and ionic or covalent radius from the position in the Periodic Chart.

9. Use the periodic chart to predict the ionic charge of an element in a compound and write formulas of chemical compounds using ionic charges.

10. Name inorganic compounds or give formulas from the names, including common acids and bases.

11. Use VSEPR concepts and Lewis structure to predict: a) bond angles b) geometry c) hybridization.

12. Classify compounds according to the type: salt, strong acid, weak acid, strong base, weak base, strong electrolytes, weak electrolytes, non-electrolyte.

13. Identify elements as metals, non-metals, metalloids and Noble gases, describe their ideal properties, and describe the periodic trends of each of these.

14. Identify compounds as ionic or covalent (molecular or network), and predict the properties based upon the structure of the compound.

15. Distinguish between intramolecular and intermolecular forces of attraction.

16. Identify the types of intermolecular forces and use them to predict properties of liquids, such as viscosity, surface tension and heat of vaporization.

To The Student:
The study of chemistry can be exciting and rewarding when there is a joint effort among students and instructors to continually improve learning. The General Chemistry program has been designed to give you every opportunity to master fundamental chemical concepts, to demonstrate this mastery and earn a good grade in the course.

Learning chemistry can be a challenge: you are confronted with a new language (terminology and symbolism) and you must synthesize new ideas while integrating your previous understanding of basic math and science. Success is a matter of exposure and practice, as any successful chemistry student will tell you. Take advantage of all facets provided for your study of chemistry: the text, lecture, computer software, lab, help sessions and office hours with your instructor. To earn a good grade you must apply yourself in all of these areas. Your goal is to understand the material well enough to answer questions, both numerical calculations and concept questions, with an ease that comes from familiarity with a subject. Read your text, and stay about one half of a chapter ahead of your lecturer. After each lecture go back to your book to reinforce things that were unclear in class. This is important — do some chemistry every day. Study of your textbook and attention in class will be most effective if you work with chemistry in small sessions, as opposed to "cramming" right before an exam. Do not expect that just because you go to class and listen that you are learning. You must explore chemistry on your own to make the subject a part of your working knowledge.

Learning is hard work. Make the effort to put in the time necessary to understand chemistry and you will be rewarded. If you fall behind seek help immediately. See your instructor as soon as you feel unsure of your learning so that together you can determine how to fix small problems early to avoid big problems later.