CH 1010 General Chemistry  
Syllabus for Fall 2017

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](http://www.clemson.edu/chemistry) (go to “Academics,” then “Undergraduate Courses,” then “General Chemistry”) or directly via [www.clemson.edu/chemistry/genchem](http://www.clemson.edu/chemistry/genchem). Course objectives, exam information including dates, and lab information are posted on this site. Many instructors also use Canvas to post course information as well as other course relevant materials.

**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 (if you plan to take only CH 1010) or for two semesters (if you are required to take both CH 1010 and CH 1020) directly from Sapling Learning. Alternatively you may purchase an access code through the Clemson University bookstore.
- Non-programmable, non-graphical 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.
  - 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.
  - The chapter ordering may differ slightly 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). Note that iclickers may not be required by all instructors.
# Class Schedule for CH 1010 Fall 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></td>
<td>Introduction to CH 1010</td>
<td>1.0</td>
<td>0.5</td>
</tr>
<tr>
<td>Chap. 1</td>
<td>Matter and Energy</td>
<td>1.5</td>
<td>1.0</td>
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<tr>
<td>Chap. --</td>
<td>Introduction to Thermochemistry</td>
<td>0.5</td>
<td>0.5</td>
</tr>
<tr>
<td>Chap. 2</td>
<td>Atoms, Ions, and Molecules</td>
<td>3.0</td>
<td>2.0</td>
</tr>
<tr>
<td>Chap. 3</td>
<td>Atomic Structure</td>
<td>8.0</td>
<td>5.0</td>
</tr>
<tr>
<td><strong>EXAM 1</strong></td>
<td><strong>Monday September 25 (7:15 pm)</strong></td>
<td></td>
<td></td>
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<tr>
<td>Chap. 4</td>
<td>Chemical Bonding</td>
<td>5.0</td>
<td>3.5</td>
</tr>
<tr>
<td>Chap. 5</td>
<td>Bonding Theories</td>
<td>4.0</td>
<td>2.5</td>
</tr>
<tr>
<td>Chap. 6</td>
<td>Intermolecular Forces</td>
<td>3.0</td>
<td>2.0</td>
</tr>
<tr>
<td><strong>EXAM 2</strong></td>
<td><strong>Monday October 30 (7:15 pm)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chap. 7</td>
<td>Stoichiometry: Mass</td>
<td>3.0</td>
<td>2.0</td>
</tr>
<tr>
<td>Chap. 8</td>
<td>Aqueous Solutions</td>
<td>3.0</td>
<td>2.0</td>
</tr>
<tr>
<td>Chap. 9</td>
<td>Thermochemistry</td>
<td>6.0</td>
<td>4.0</td>
</tr>
<tr>
<td><strong>EXAM 3</strong></td>
<td><strong>Monday December 4 (7:15 pm)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chap. 10</td>
<td>Properties of Gases</td>
<td>3.0</td>
<td>2.0</td>
</tr>
<tr>
<td><strong>FINAL EXAM</strong></td>
<td><strong>Wednesday December 13 (11:30 am)</strong></td>
<td></td>
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</tbody>
</table>

**Laboratories:** Labs will begin the week of September 4. You **must** be scheduled for a laboratory section 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 sheet.
- 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](http://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:

- Your Peer Leader: See the note below on PAL.
- Your lecture Instructor: See section syllabus for office hours.
- Drop-in tutoring: The Academic Success Center offers FREE drop-in tutoring in a group setting on the first floor of the ACS building. For the tutoring schedule, see [www.clemson.edu/asc/tutoring/](http://www.clemson.edu/asc/tutoring/).
- Form a study group with other students who are taking CH 1010. (They don’t have to be in your section.) It can really help.
- Help sessions may be offered periodically by instructors.
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 activities (comment 3). Course grades will be apportioned as shown below:

- Laboratory (comment 1) 25%
- Exams 40% (three exams 13½ % each)
- Final Exam (comments 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 dramatically.

Comment 2: The Final Exam grade may substitute for your lowest exam grade of the semester if it is to your advantage and you score above 70% on the Final Exam.

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, page 2, in your planner. The location of the exam for your section will be communicated to you 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 will be tested. The Final Exam in CH 1010 will be comprehensive over the semester. The Final Exam in CH 1020 (Spring 2018) will be cumulative, covering material from both CH 1010 and CH 1020.

3. Students who have conflicts with official university functions must see their instructor by Friday September 1 to resolve these issues. 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 errors occur with your exam grade, see your instructor within 10 days of the exam. NOTE: Most grade problems are due to poor erasures, not using a #2 pencil, poorly filled out answers, I.D. number, section number, etc.

5. 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 one-half a chapter ahead by reading the text and working the problems.

6. Resolve Final Exam scheduling issues at least 10 days prior to 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 1010 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)

7. 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. It would be to the student's advantage to utilize this period reading the missed material from the current chapter.

8. The last day to withdraw from the course without record is Tuesday, September 5; the last day to drop the course without a final grade is Tuesday, October 31.

9. Other Problems – First, see your professor. For general questions, see Ms. K. Coleman in Hunter 219; telephone: 656-3089, email: kcolem3@clemson.edu. If necessary, see the Director of General Chemistry, Dr. Taylor in Hunter 265; email: dftay@clemson.edu.

**Make-up Exam Policy**

Should a student be unable to take a scheduled exam due to an emergency situation, the student should contact his/her instructor as soon as possible, providing documentation of the emergency. For an excused absence, the student has two options as to making up the missed work. It is the student’s responsibility to notify her/his instructor within one week of his/her return to class as to which option the student chooses for making up the exam. Option 1 is recommended by the Chemistry department.

**Option 1:** Allow the score from the Final Exam to replace the missed exam score. Essentially, the missed exam score is treated as the student’s lowest score and handled as per comment 2 above.

**Option 2:** Take a make-up exam that is scheduled for Friday December 15 at 9:00 a.m. This exam will be a mix of multiple choice and fill-in-the-blank questions and will cover material similar, but not identical, to that of the missed exam. A student who chooses this option is not eligible for the exam replacement policy detailed in comment 2 above.

Should you be unable to take the final exam due to an emergency situation contact your instructor prior to the exam time, providing documentation. A make-up will be scheduled and the student will receive an Incomplete (I) grade in the course. The expectation is that the make-up exam will be completed within 30 days of the beginning of the spring semester.

**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 TTh 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 [2017-2018 Undergraduate Announcements](http://2017-2018 Undergraduate Announcements).

If a class is to be missed, the “Notification of Absence” module on the student’s tab of Canvas should be used to notify the instructor of the absence, whether anticipated or unanticipated. A brief explanation should be included in the notification along with dates and times of the absence. This notification does not serve as documentation of an excused absence; students are encouraged to discuss the absence with their instructor as the instructor is the only person who can excuse an absence. 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 Canvas 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 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 course instructor, there is evidence that a student has committed an act of academic dishonesty, that instructor will make a formal written charge of academic dishonesty to the Associate Dean of Undergraduate Studies.

Accommodations for Students with Disabilities
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. You can access further information here: http://www.clemson.edu/campus-life/campus-services/sds/.

Students who receive Academic Access Letters are expected to meet with their instructor to discuss necessary accommodations. This meeting should take place during the instructor’s office hours as Academic Access Letters are confidential and not to be discussed in a classroom setting. This meeting should be scheduled as early as possible in the semester so that accommodations can be made in a timely manner. It is the student’s responsibility to schedule the meeting and ensure that accommodations are adequate. Attaching an Academic Access Letter to an email message addressed to your instructor is not an acceptable substitute for a face to face discussion with your 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 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 110 Holtzendorff Hall, 864.656.3181 (voice) or 864.565.0899 (TDD).

Outside Study Help
Peer Assisted Learning (PAL) sessions are available for CH 1010 to assist you in better understanding the subject material and how to study. Course Support Services at the Academic Success Center provides free PAL sessions by qualified undergraduate peer leaders. These sessions are open to all students who wish to improve their understanding of course material, concepts and study skills. The sessions give students the opportunity to learn more from the course by keeping the material from lectures fresh in their minds and the opportunity to discuss and practice course material in an engaging and interactive environment. The scheduled times, locations and peer leaders CH 1010 are provided on the ASC website at www.clemson.edu/asc/.
**Prerequisites**
This course has a pre- or co-requisite of a math placement (CMPT) score of a 60 or higher or completion of MATH 1010, 1020, 1030 or 1050 or concurrent enrollment in MATH 1040 or 1060.

Before beginning the first CH 1010 class, you should be able to do the following (some of these will be reviewed briefly, but if you cannot do these, you should work especially hard now, or consider delaying Chemistry until you build your background skills). This background knowledge is expected on all exams!

- Use mathematical terms and equations including: algebra, exponential numbers, logarithms, ratio and proportion.
- Use significant figures.
- Interpret and work with numbers in scientific notation.
- Convert between English - metric (SI) units.
- Make and read graphs.
- Interpret word problems.

**Student Learning Objectives for CH 1010**

1. Make conversions of quantities using dimensional analysis.
2. Use the rules for significant figures with numbers in calculations.
3. Understand the organization of the Periodic Table. Identify elements as metals, non-metals, metalloids and Noble gases.
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. Explain what is meant by the wave-particle duality of both light and matter.
6. Predict relative magnitude of the elemental properties of electronegativity, electron affinity, ionization energy, and ionic or covalent radius from the position in the Periodic Chart.
7. Use the periodic chart to predict the ionic charge of an element in a compound and write formulas of chemical compounds using ionic charges.
8. Explain the continuum that exists for bonding in compounds;
   ionic → polar covalent → non-polar covalent.
9. Draw Lewis structures for covalent compounds.
10. Use VSEPR concepts and Lewis structure to predict: a) bond angles b) geometry c) hybridization.
11. Use Valence Bond Theory to describe the bonding between atoms in a molecule.
12. Distinguish between intramolecular and intermolecular forces of attraction.
13. Identify the types of intermolecular forces and use them to predict properties of liquids, such as viscosity, surface tension and heat of vaporization.
14. Write and balance a chemical equation if given the names or formulas of each reactant and product.
15. Define and calculate: theoretical yield, actual yield, percent yield and limiting reagent; and determine which reactant is the limiting reagent.
10. Classify compounds according to the type: salt, strong acid, weak acid, strong base, weak base, strong electrolytes, weak electrolytes, non-electrolyte.
11. Identify the three major types of reactions that can occur in aqueous solution.
12. Distinguish between exothermic and endothermic chemical reactions and physical processes.
13. Perform calculations related to the energy changes that accompany chemical reactions and physical processes.
14. Use the Ideal Gas model and equation to describe the behavior of a gas or a mixture of gases.
Final Comment on Learning Chemistry.
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 is designed to give you every opportunity to master fundamental chemical concepts and to demonstrate your mastery while earning a good grade.

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 opportunities 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 questions that test your conceptual understanding, 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 text 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 insecure with the material you are learning. It is better to address issues when they arise, before they become an obstacle to your progress.