Chemistry 110 General Chemistry

Syllabus
Fall 2016
Dr. Doug Hines

Contact Info:
Office: 213 Heim
Phone: 321-4359
Office Hours: Stop by, or make an appointment
Email: hines@lycoming.edu

Prerequisite:
Math 100 (credit or exemption from)

Meeting Times:
Lecture: MWF (10:15 am – 11:05 am) in G09 Heim
Recitation: TH (7:45 am – 8:35 am or 1:00 pm – 1:50 pm) in G09 Heim

Course Description:
In this course we will begin to cover the foundations of chemistry. The focus will be on the first 9-10 chapter of the book and will span the topics of atomic structure, chemical reactions and stoichiometry, gas laws, thermochemistry, orbitals and basic quantum theory, bonding theories and molecular geometry. In short, we will study the physical and chemical behavior of solids, liquids and gases while at the same time developing an understanding of some of the basic relationships between matter and energy. Successful completion of this course will indicate that you have the ability to work through the math associated with the course material while also demonstrating an in depth understanding of what your solutions mean. To pass this course, you will need to have (or develop) a basic knowledge of algebra and familiarity with logarithms.

While there will be a significant amount of conceptual information studied in this course, it is important to remember that this is not a memorization based subject. The focus on problem solving, even in entry level chemistry courses, is a product of my belief that every student should be better at critical thinking. This is important to your success at Lycoming College and is imperative in your pursuit of employment in the future. If you have any difficulty with Math please see me immediately and we will begin to work on enhancing your skillset. Also, feel free to seek additional help in the tutoring center on campus (see additional help section). The key to passing this class is to work hard on homework assignments and to seek help (from myself, your classmates or the tutoring center) immediately if you have any difficulties.

Learning Objectives:
Upon completion of the lecture portion of this course, you should be able to:

- Describe measured quantities, their magnitude, and their uncertainties using units, unit conversion, and significant figures
- Demonstrate an understanding of the fundamental properties of chemical systems including atomic structure, molecular structure, stoichiometry, thermochemistry, quantum theory, and chemical bonding as well as the vocabulary that goes along with these topics
• Demonstrate how the state in which matter exists (solid, liquid, gas) is related to its chemical properties and reactivity
• Use mathematical calculations to describe the fundamental properties of chemical systems including atomic structure, molecular structure, stoichiometry, thermochemistry, quantum theory, and chemical bonding

The Lycoming Chemistry Department believes that students completing a major in chemistry will be able to:

1. Exhibit proficiency in the major sub-disciplines of chemistry
2. Perform wet laboratory techniques as appropriate to the major sub-disciplines of chemistry
3. Understand and use modern chemical instrumentation
4. Exhibit integrative, problem-solving skills, such as experimental design, data manipulation, and data interpretation
5. Communicate the results of chemical investigations effectively in written and oral form
6. Search the chemical literature, evaluate the results of the search, and access desired research materials
7. Demonstrate responsible conduct in the laboratory, including laboratory safety and ethical research practices

This course will provide instruction in the following areas covered by departmental learning goals 1, 2, 4, 5, and 7. The course also provides instruction in support of the Lycoming College mission statement.

**Required Course Materials:**

- Chemistry 110 Laboratory Manual (available at the Lyco bookstore)
- Turning Technologies RCRF-02 or RCRF-03 Clicker Device (available at the bookstore)
- Casio FX-260 Solar non-programmable calculator (no passing or sharing allowed in exams)
- Bound laboratory notebook (available at the Lyco bookstore)
- Safety Glasses (available at the Lyco bookstore)

**Office Hours/Additional Help**

Office hours are for the purpose of walk in instruction, discussion, or just to chat. Unless otherwise announced, I will normally be available when my door is open, but you are always welcome to make an individual appointment. The Academic Research Center (ARC) is available for course tutoring, including writing. ARC is on the third floor of Snowden Library. **Do not wait until the night before an exam or assignment is due to get assistance.** An optional study group led by a student facilitator will be scheduled (date and time to be announced later). **The path to success in this course is through hard work. If you find yourself struggling with the material, please get help before you get behind.**
Grading

Grades will be scaled to the number of points in the table below.

<table>
<thead>
<tr>
<th>Points</th>
<th>Examinations (4)</th>
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<tbody>
<tr>
<td></td>
<td>First midterm score</td>
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<td></td>
<td>Second midterm score</td>
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<td>Third midterm score</td>
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<td></td>
<td>Final exam</td>
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<td></td>
<td>Weekly Moodle Quizzes</td>
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<td></td>
<td>Quizzes (7)</td>
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<td></td>
<td>Clicker Questions</td>
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<td></td>
<td>Laboratory</td>
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<td>Total</td>
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- The quiz grade consists of the algebra check score and the five highest quiz scores. **There will be no makeup quizzes.** Because there are six quizzes, this means that the lowest score will be dropped.
- Clickers will be used to monitor progress on homework questions as well as for monitoring your understanding of material in class. The percentage of correct answers will determine the points earned for these questions. Each student will be able to drop nine questions so being absent for approximately three classes will not affect this portion of your grade. On the off chance that a question is harder than originally planned, I reserve the right to throw that question out and not use it as part of the overall clicker grade. While it is unlikely that this will happen often, it remains a possibility.
- If you know that you will be unable to attend class on the day of an examination (for a funeral, health-related circumstance, or Lycoming athletics), it is your responsibility to contact the instructor a week before to arrange to take the exam early. If you miss an exam due to an unforeseen emergency (with an excuse approved by the Provost’s office), the exam will be replaced with the average of your other exam scores (only one exam per semester may be replaced). All other absences on exam dates will result in the awarding of zero points for the exam. **No makeup examinations will be given after the scheduled exam date/time.**

The grading scale will be as follows. Adjustments to this scale are possible, but only in an extreme case.

\[
\begin{align*}
\geq 90\% & \quad \text{A range (A/A- cutoff: 92\%)} \\
80-89\% & \quad \text{B range (B+/B cutoff: 88\%, B/B- cutoff: 82\%)} \\
70-79\% & \quad \text{C range (C+/C cutoff: 78\%, C/C- cutoff: 72\%)} \\
60-69\% & \quad \text{D range (D+/D cutoff: 68\%, D/D- cutoff: 62\%)} \\
< 60\% & \quad \text{Fail}
\end{align*}
\]
- **In order to receive a passing grade, you must achieve at least 60% of the points in both the lecture (exams/homework) and laboratory portions of this course.**

**Moodle**

This course utilizes a content management system (fancy name for a website) called Moodle. You will be **expected** to check this website frequently for announcements, course information, and scheduling. **The course Moodle site is the only place where homework assignments will be announced.** You can find the site by going to [http://moodle.lycoming.edu](http://moodle.lycoming.edu) searching for Chemistry 110 (not the lab page). This website will also be the location of the aforementioned weekly Moodle quizzes. These quizzes will be opened weekly from Wednesday to Sunday night and will not be reopened other than for legitimate excuse.

**Examinations**

Midterm examinations will be given during regularly-scheduled lecture in Heim G09 and will be administered on the following dates. Because the material presented later in the class builds upon concepts presented earlier, all exams should be considered cumulative. **The final examination time and date is established by the registrar.**

<table>
<thead>
<tr>
<th>Examination</th>
<th>Date</th>
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<tr>
<td>Examination 1</td>
<td>September 28 (Wednesday)</td>
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<td>Examination 2</td>
<td>October 26 (Wednesday)</td>
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<td>Examination 3</td>
<td>November 30 (Wednesday)</td>
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<td>Final Examination</td>
<td>December 16 (Friday; 8:30 – 11:30 AM)**</td>
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**Homework/Quizzes/Clickers**

The selected homework problems provide an indication of the topics that are important in this class and I believe that practicing these problems is the best strategy for successfully completing this course. Because learning can be much more efficient through failure, I feel strongly that they should be attempted individually before seeking help from others or before checking the solutions manual. **Homework assignments will be posted on our class Moodle website and will not be announced in class.** Please feel free to stop by my office to discuss any difficulties you may have with the homework problems. Although some professors will collect homework problems that have been completed by students, I will not be collecting these problems. Your mastery of the homework concepts in this course will be evaluated through the use of quizzes on the Moodle site. You will have one Moodle quiz per week for a total of 36 total points across the semester. You can assume that each quiz is worth 3 pts and that you get to drop your two lowest scores of the 14 quizzes.

In-class quiz dates are listed below and will be given with 20 minutes remaining in the regularly scheduled lecture. The quiz questions will either reflect the recitation/homework problems or in some cases may address the same topics but in a different manner. **Successful completion of these quizzes will require that you have done practice problems outside of class and recitation.** As with the examinations, quizzes should be considered cumulative and may contain information from the lecture portion of the course. The six highest quiz scores will count toward your grade. Quizzes will occur on Wednesdays and, unless you are notified otherwise (no later than a week prior to the scheduled quiz
date), they will be given on the following dates:

<table>
<thead>
<tr>
<th>Quiz #</th>
<th>Date</th>
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<tbody>
<tr>
<td>Quiz 1 (Algebra)</td>
<td>September 7</td>
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<td>Quiz 2</td>
<td>September 14</td>
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<td>Quiz 3</td>
<td>September 21</td>
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<td>Quiz 4</td>
<td>October 12</td>
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<td>Quiz 5</td>
<td>October 19</td>
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<td>Quiz 6</td>
<td>November 9</td>
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<td>Quiz 7</td>
<td>November 16</td>
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Clicker question will be implemented during each lecture class meeting. They may occur at any point of the lecture, and they will require students to respond using the class-assigned clicker (either Turning Technologies RCRF-02 or RCRF-03). You are responsible for bringing these to class and they will also be used to take attendance (you will be considered absent if you forget your clicker device). No one will receive any accommodation if they have forgotten or lost their clicker device. **It is in your best interest to not only be in class for every meeting, but also to answer every clicker question.**

**Distribution Requirement**

Because this course meets a distribution requirement, it includes a writing component. At least 10 pages of writing will be expected from each student during the semester, some of which will be formally evaluated. If you need help with writing, please feel free to ask the instructors for assistance. You can also get assistance with writing at the writing center on the third floor of Snowden Library.

**Special Needs**

Lycoming College provides academic support for students who officially disclose diagnosed learning, physical, and psychological disabilities. If you have a diagnosed disability and would like to seek accommodations, please contact Jilliane Bolt-Michewicz, Assistant Dean of Academic Services. She can be reached by calling 570-321-4050, emailing michewicz@lycoming.edu, or visiting her office (Academic Resource Center, 3rd Floor of Snowden Library).

**Schedule**

The schedule of this class is subject to some adjustment, however the plan is to get through at least the first 3 chapters by Exam 1. The second exam will cover through chapter 5, the third exam should cover up through chapter 7, and the final will be composed of some new material from the remaining chapters (8-9) as well as cumulative information from the entirety of the course. Again this schedule is subject to some change, and our pace in the course will be dictated by your level of comprehension of the course material.

**Attendance**

Regular attendance at lecture and recitation is **expected**. Students with 4 or more absences will incur a reduction in their final grade of 10%. I do not distinguish between excused and unexcused absences. Missing the attendance taking process (using clicker devices) will cause you to be considered absent. **I will not inform you of the number of classes that you have missed during the semester.**
In the case of a campus-wide flu outbreak, Lycoming College advises that you do not attend class until any fever has dissipated for 24 hours. I will honor this policy, so if you find that you have contracted the flu, you should contact Dr. Hines and your lab instructor using your Lycoming email prior to missing your first class.

Colloquium/Extra Credit

Extra credit will be awarded for attendance at chemistry colloquium (Fridays and some Wednesdays from 3:25–4:25pm). Two points will be added to your exam grades for each seminar attended (to a maximum of 12 points). If your schedule does not permit attendance at colloquium, you may complete an alternate writing assignment that will be discussed in class. Plagiarism of an extra credit assignment will be considered a violation of the academic honesty policy of the student handbook and will be reported to the Provost.

Academic Dishonesty (from the Student Handbook):

Academic dishonesty is a willful perversion of truth, or stealing, cheating, or defrauding in instructional matters. Students will have engaged in academic dishonesty if they copied the work of another without attribution, willfully allowed another to copy their work, falsified information, submitted the work of another as though it were their own, or committed other acts of plagiarism or actions deemed to be dishonest by the instructor. ACADEMIC DISHONESTY IS A VERY SERIOUS CHARGE, WHICH CAN LEAD TO SUSPENSION FROM THE COLLEGE. All students should become familiar with the rules of academic honesty and apply them in ALL academic work. Instances of academic dishonesty will result in failure of the course and will be reported to the Provost.

Technology Policy

While you are expected to attend and participate in this class, your cell phone, computer, and MP3 players are not. Use of cell phones, tablets, computers, and MP3 players during class will not be permitted and will result in your dismissal from the class for the day. Students wanting to use a tablet device for taking notes in lecture should discuss this with the instructor first. Use of cell phones, computers, MP3 players, or other devices during examinations, written quizzes, or clicker quizzes will be considered academic dishonesty, which will be reported to the Provost and will result in a zero being awarded for the quiz or examination (No exceptions!).

The only calculator that you may use in this course is the Casio FX-260 Solar. We have taken this step because we have found that some basic scientific calculators produce erroneous results due to the programming utilized by the manufacturer to round numbers and because we have found that many students have difficulty using scientific calculators. Having one model will allow the instructors to introduce directions for using the calculator that will be applicable to all students in the course. It is suggested that you utilize this calculator even outside of class so that you will become familiar with it. Students found using an alternate calculator during an exam or quiz will receive a zero for the assignment (No exceptions!).

Laboratory Instruction

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<thead>
<tr>
<th>Lab Instructor</th>
<th>Responsibilities</th>
<th>Office Number</th>
<th>Email Address</th>
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<tbody>
<tr>
<td>Annie DiSante</td>
<td>Q, QT, R, RT</td>
<td>212</td>
<td><a href="mailto:disante@lycoming.edu">disante@lycoming.edu</a></td>
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</table>
Laboratory Attendance

Acceptable performance in the laboratory is imperative for success in chemistry and attendance in laboratory is mandatory. No student will pass the course with less than a score of 60% in the laboratory portion of the course. You will be expected to arrive to laboratory on-time. Missing the prelab lecture session may result in your dismissal from the lab for the day. Makeup laboratory experiments will be difficult, if not impossible to schedule, and will only be permitted for legitimate reasons. All laboratory makeup sessions must be approved by myself and Annie DiSante.

Laboratory Safety

Safe laboratory practices, including proper attire, will be expected at all times. Long pants are required as well as closed toe shoes (no sandals or bare feet). Wearing contact lenses during laboratory session is strongly discouraged. If you feel you need to wear your contact lenses during laboratory session, you should first discuss this with the laboratory coordinator. You will not be permitted to begin any experimental procedures until all safety concerns have been addressed. Repeated safety violations will cause your expulsion from the laboratory and a zero for the experiment.