



Chemistry 110
General Chemistry
Syllabus
Fall 2014



Lecture Instructor

Dr. Jeremy Ramsey

Responsibilities

Lecture, Recitation

Office Number

232 Heim
321-4103

Office Hours

Just stop in or
by appointment

Contact Info

ramsey@lycoming.edu
Twitter-- @lycochem110fall2014

Rationale for Instruction

The material presented in this course covers the fundamental principles of chemistry. Topics to be covered include models of atomic structure, stoichiometry, gas laws, thermochemistry, basic quantum theory, chemical bonding, and molecular shape. The concepts presented will be used to understand the chemical nature of the major classes of matter—solids, liquids, and gases.

We will perform a large number of calculations this semester, but it is not just important to be able to get the right answer. You should also understand why you performed the particular calculation and how it relates to the theory of the chemical problem that you are studying. Because of this, it will be necessary for you to understand what is happening chemically before beginning a calculation. This is a source of frustration for many students as they are used to memorizing how to solve a problem and then being evaluated using almost identical problems during an exam or quiz. This will not be the case with this class. As with all learning, some memorization will be necessary, however, methods involving straight memorization will not be effective for much of this class. You should strive to adapt your learning method toward understanding what you are doing as opposed to just memorizing a necessary series of steps to complete a problem.

One of the goals that I have for this semester is to introduce you to the fundamental principles of chemical systems, and I have dedicated myself to helping you reach this goal. The motivation, however, must begin with you. The material in this course will be challenging and will require a lot of hard work for its mastery. A wealth of opportunities exists to assist you with your studies so please take advantage of them. If you do, I am confident that we can both achieve our goals for the semester.

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

"In the middle of difficulty lies opportunity"

-- Albert Einstein

"Practice isn't the thing you do once you're good. It's the thing you do that makes you good."

-- Malcolm Gladwell from *Outliers: The Story of Success*

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.

Meeting Times

Lecture	MWF	11:30 am to 12:20 pm	G09 Heim
Recitation	Th	7:45 am or 1:00 pm	G09 Heim

Prerequisite

- Math 100 (credit for or exemption from)

Required Course Materials

- Textbook: Chemistry: The Science in Context, 2nd Edition by Gilbert, Kirss, Foster, and Davies (An electronic copy is available on-line from CourseSmart at <http://www.coursesmart.com>)
- 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)

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

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> and searching for Chemistry 110 (not the lab page).

Twitter

I am using Twitter for the first time this year so that I can be a little more available for interacting when I'm away from my office and computer (I don't check my Lycoming email in the evenings or on weekends). I will use this Twitter feed to make class announcements and to share things with anyone that follows @lycochem110fall2014 . This will be a good place to answer quick questions and make announcements. All official announcements will also be sent via Moodle, but this will give me a quick method of communicating when I am away from my computer and unable to post via Moodle.

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.*

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).

Grading

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

	<u>Points</u>
Examinations (4)	450
<i>First midterm score</i>	<i>105</i>
<i>Second midterm score</i>	<i>105</i>
<i>Third midterm score</i>	<i>105</i>
<i>Final exam</i>	<i>135</i>
Homework	100
<i>Quizzes</i>	<i>85</i>
<i>Clicker Questions</i>	<i>15</i>
Laboratory	115
Total	665

- 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 and the usage of YouTube instructional videos. 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.
- 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.**

"You have to be confused before you can reach a new level of understanding anything."
-- Dudley Herschbach

The grading scale will be as follows. Adjustments to this scale are possible, but very highly unlikely.

≥ 90%	A range (A/A- cutoff: 92%)
80-89%	B range (B+/B cutoff: 88%, B/B- cutoff: 82%)
70-79%	C range (C+/C cutoff: 78%, C/C- cutoff: 72%)
60-69%	D range (D+/D cutoff: 68%, D/D- cutoff: 62%)
< 60%	Fail

- ***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.***

Examinations

Midterm examinations will be given during regularly-scheduled lecture time in D001 (Academic Center) 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.

Examination 1	September 24 (Wednesday)
Examination 2	October 22 (Wednesday)
Examination 3	November 24 (Monday)
Final Examination	December 11 (Thursday; 8:30 – 11:30 AM)**

Homework

The selected homework problems provide an indication of the topics that are important. This makes solving them of utmost importance to your grade and your performance in the course will likely correlate with the amount of time spent solving problems. 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.*** Assigned homework will take the form of textbook problems that can be found at the end of each chapter. 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, your mastery of the homework concepts in this course will be evaluated through the use of quizzes and clicker questions.

Quiz dates are listed below and will be given at the end of a regularly scheduled lecture. The quiz questions are taken from or based on recitation/homework problems. ***They will require that you actually practiced prior to the quiz.*** As with the examinations, quizzes should be considered cumulative and may contain information from the lecture portion of the course. The five highest quiz scores will count toward your homework 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:

	<u>Date</u>
Algebra Check	September 1 (Monday)
Quiz 1	September 10
Quiz 2	September 17
Quiz 3	October 8
Quiz 4	October 15
Quiz 5	November 5
Quiz 6	November 12

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. Students will be allowed to drop nine clicker questions for the semester, which is intended to allow for absences that may be beyond the control of students (for a funeral, health-related circumstance, or Lycoming athletic events). **It is in your best interest to not only be in class for every meeting, but also to answer every clicker question.**

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. Ramsey 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 3:15-4:15pm). 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 assignment. The assignment will be submitted to Turnitin. 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!).**

“The most dangerous kind of overconfidence in our abilities comes not when we are already skilled at a task but when we are still unskilled.”

-- Christopher Chabris and Daniel Simons from *The Invisible Gorilla and Other Ways Our Intuitions Deceive Us*

Laboratory Instruction

<u>Lab Instructor</u>	<u>Responsibilities</u>	<u>Office Number</u>	<u>Email Address</u>
Dr. Charles Mahler	Lab Sections M, N, R	202 Heim, x4351	mahler@lycoming.edu
Dr. Chriss McDonald	Lab Section Q	233 Heim, x4186	mcdonald@lycoming.edu

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, and will only be permitted for legitimate reasons. All laboratory makeup sessions (even for night lab students) must be approved by and arranged through Dr. Mahler.

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.**

"Anyone who stops learning is old, whether at twenty or eighty."

--Henry Ford

"Discipline is just choosing between what you want now and what you want most." --Unknown Author

"Success is a function of persistence and doggedness and the willingness to work hard for twenty-two minutes to make sense of something that most people would give up on after thirty seconds."

-- Malcolm Gladwell from *Outliers: The Story of Success*

"The finding that incompetence causes overconfidence is actually reassuring. It tells us that as we study and practice a task, we get better at both performing the task and knowing how well we perform it."

-- Christopher Chabris and Daniel Simons from *The Invisible Gorilla and Other Ways Our Intuitions Deceive Us*