

CHEMISTRY 109

Lecture 1, Fall 2012

Read This Syllabus Today. Keep It for Future Reference.

Advanced General Chemistry:	5 credit hours
Lecture:	12:05 PM MWF 1351 Chemistry
Instructor Information:	Professor Frank N. Keutsch 1305 Chemistry (262-5154) chem109fk@chem.wisc.edu
Office Hours:	M 13:00-14:00 PM 4355 Chemistry or email for an appointment

Chemistry 109 is a one-semester, accelerated, first-year college course in chemistry. The goals of this course are: 1) to build your skills in problem solving, analytical reasoning, and laboratory manipulation, and 2) to build your knowledge of the fundamental chemical principles of atomic and molecular structure, kinetics, and thermodynamics. In this class we will apply these principles to condensation-hydrolysis reactions, acid-base reactions, and oxidation-reduction reactions. We will emphasize applications in living organisms (for example in drug design), and in the industrial world (for example in fuel production and utilization).

Is Chemistry 109 the right course for me? It is if you can answer yes to all of these questions. 1) Does your potential major require chemistry beyond General Chemistry, or are you considering a major that would require more chemistry? 2) Did you qualify for placement into Calculus (Math 221) or a higher math course? 3) Have you taken one year of high school chemistry with a grade of A- or better and scored at least 29 on the ACT or at least 650 on the SAT math test, or have you taken two years of high school chemistry (AP is good) and scored at least 27 on the ACT or 620 on the SAT math test? 4) Do you enjoy science, feel reasonably well prepared, and have a strong work ethic?

Course Organization and Expectations

This course is designed to help you to learn chemistry. Your professor and TA will do their best to guide you in mastering the material, but no course or instructor can learn for you. Learning is something only you can do. For that reason *you are the most important feature of the course*. Many learning activities are offered to meet the needs of different types of students; however, if you find that your learning needs are not being met or you are not satisfied with something please bring your concern to your professor, your TA, or your Student Board of Directors representative.

You will need to devote considerable outside-of-class time to studying chemistry. A good rule of thumb is that you should be spending approximately three hours outside of class for each hour you are in class. A recommended study strategy for this course is: 1) read the assigned material in the textbook before each class session, 2) attend class and take your own notes, 3) as soon as possible after class, begin to work homework problems. When you encounter problems that you cannot solve, refer to the textbook, your notes, a tutorial, or your fellow students. Forming a study group to work through problems is an excellent way to learn chemistry.

Throughout this course emphasis will be placed on understanding chemistry and learning to think effectively in solving problems. Successful problem solving requires a basic knowledge of principles, facts, and terms: a vocabulary of chemistry. Some of this background and vocabulary should have been obtained from your high school chemistry course. From time to time you may need to review material you studied in high school in order to understand the new material presented in this course. To help you review there are three Review Homework assignments. The first of these must be completed Sunday, Sept. 9, and the second two weeks later (Sept. 23). The third comes in early November. Chemistry is a cumulative subject; what you learn this semester will build upon background material that you learned earlier.

To help you to master the new material presented in this course, specific learning objectives are provided for each exam. These objectives will be available under the Exam Preparation Materials headings in Moodle (see below). Use the learning objectives to guide your work on the homework sets and to review for the exams. Study questions keyed to the learning objectives are also available in the same location to give you more problem-solving practice. Practice exams, and fully worked out answers, will be available for you to use in preparing for each exam. Some additional objectives will become available from time to time to cover material introduced for the first time this year.

Required Texts & Materials

You will need to purchase each item listed below. These are the only required items for this course.

Textbook: *Chemistry: The Molecular Science* 4th ed. Moore, Stanitski, Jurs (or you can use the free online textbook).

Lab Manual: *Chemistry 109 Laboratory Manual, Fall 2012*, Chemistry Department, University of Wisconsin-Madison: available from Alpha Chi Sigma (the co-ed chemistry fraternity) in chemistry building lobby the first week of classes.

Lab Notebook: Carbonless laboratory notebook with duplicate pages: available from Alpha Chi Sigma or local bookstores (where it is more expensive).

Safety Goggles: Industrial quality eye protection—goggles that completely seal around the eyes and fit over regular glasses—is required at all times when you are in the lab. Purchase from Alpha Chi Sigma or local bookstores (~\$10).

Calculator: An inexpensive calculator is required. It should have capabilities for square roots, logarithms and exponentiation (antilogarithms), and exponential (scientific) notation operations. The calculator will be used on homework assignments, pre-lab quizzes, exams, and in the lab. You may use programmable calculators in this course.

Web-Based Course Materials and Class Emails

To access Web-based materials, you must activate your UW-Madison NetID so you have an ID and password. You probably did this at SOAR during the summer. If not, activate your NetID by going to <http://my.wisc.edu>, clicking on Activate your NetID, and following the directions. You may also change your NetID password at this same Web site.

Much information about this course will be transmitted via email, using an automated email list based on registration in the course. An email was sent to everyone on this list on August 27. If you did not receive such an email, you probably are not reading your @wisc.edu emails. It is best to use your @wisc.edu email for UW-Madison communications. You can tell your other email accounts to forward to your @wisc.edu email account, or *vice versa*.

Technology Enhanced Learning: Moodle Web Site; Online Textbook

Much of Chem 109 is only available via **Moodle**. You automatically have access if you are enrolled in this course. You can use Moodle on your own computer, a friend's computer, or any other computer on campus. Direct your Web browser to <http://innovate.moodle.wisc.edu>. Log in (link is in top-right corner) by entering your NetID and Password; this is the main course.

An optional **textbook** for this course is online and free. Click [this link](#) to access it. Then click on [How to Use This Site](#) in the menu on the left side of the screen. Next, go back to [UW-Madison Chem 109-2012](#) to access the textbook. The online textbook is keyed to each lecture in the course, so the first entry you want is W Sep 5. This date gives you all of the review readings for material you have studied in high school. Readings should be done before lecture on the specified date.

Please log in to Chemistry 109, Fall 2012, Lecture 1 (Keutsch) in Moodle as soon as possible. Using the link provided in the center panel, or on the Quizzes page (link to quizzes is in Activities panel on the left), work on the **Practice Quiz**, which is designed to check out your computer to make sure it will do everything you will need during the semester. Do the Practice Quiz on the computer you are most likely to use for online homework assignments and tutorials this semester. **The Practice Quiz is due at midnight, Sunday, September 9**, but don't wait until the last minute to do it. If you have trouble getting your own computer to do the Practice Quiz, then use a computer in the chemistry building to complete the assignment. If you change computers during the semester, do the Practice Quiz on the new computer to be sure everything works.

Also begin to work on **Review Homework 1**, which is **due at midnight Sunday, Sept. 9** and on **Homework 1**, which is **due at midnight on Sunday, Sept. 16**.

Safety Quiz

Before your first lab period you must achieve a perfect score on a Safety Quiz and an Academic Honesty Quiz in Moodle. The quizzes are listed under the second week's assignment. *If you carefully read the safety pages (pp xix to xxii) in your lab manual before taking the Safety Quiz, you should have no difficulty getting a perfect score.*

Health or Disability Concerns

All students at UW are entitled to an accessible, accommodating, and supportive teaching and learning environment. The provision of reasonable accommodation for students with disabilities is a shared faculty and student responsibility. Students are expected to inform their professor of their need for accommodation; the professor and TA are expected to make the reasonable arrangements. If you have special needs, please contact Prof. Keutsch and your TA at your earliest convenience. If you have a condition that might result in a seizure, loss of consciousness, or other situation that might endanger your safety or the safety of others in the laboratory, please inform your TA.

The rest of this syllabus and the course schedule are in Moodle. Log in and use the Course Info and other panels on the right to view and download the Syllabus, Assignment Schedule, and other resources. The full syllabus contains information about how your final grade will be calculated, among other things.

Learning Activities in Chemistry 109

Chemistry 109 has different learning activities to meet the needs of the many types of students in our class. You do not need to attend every class, make use of every tutorial, or do every study problem; rather, your job is to sample the different types of materials offered and to select those activities that most effectively support your learning. In the lecture, the professor will lecture, do demonstrations, or lead problem solving. In discussion section, your TA will engage a smaller group of students in problem solving, answer specific questions on the course material, and discuss the laboratory exercises. Finally, in lab you will explore chemical principles through hands-on experimentation. To supplement these activities, tutorials are provided to aid your mastery of the material. Attendance at the lectures and the discussion sections is strongly encouraged, but not required; students who consistently attend outperform those who do not. Laboratory attendance is mandatory; students who do not attend will not pass this course.

Lecture

In class Prof. Keutsch will provide an organizational framework, discuss principles, and present illustrations and demonstrations. He will not describe or explain everything you should learn; rather, he will indicate what topics you should study and provide insights into those topics. Lectures will also give you an opportunity to think about these topics and see whether you understand them. You should take notes during lecture; note taking should be an active, thinking process. Your notes should reflect your understanding of what you heard and saw. Prof. Keutsch will provide opportunities for you to test your understanding of particular concepts through in class questions. If there are particular concepts or ideas that are not clear to you feel free to ask Prof. Keutsch or your TA about them during class, after class, by email, or in office hours. Sample lecture notes taken by a Teaching Assistant (TA) will be posted in [Moodle](#) shortly after each lecture; don't rely on these notes in place of your own, but, if you need to miss a class, they are an acceptable substitute. Please do not expect to learn everything you need to know in the classroom; you will learn far better by working problems on your own or with a group of other students outside of class.

Textbook.

In addition to the printed textbook, an online textbook is available at zero cost to you in an online system called [ChemPaths](#). The textbook will continue to be available online after the course is over and you will continue to have access to it for at least two years. The textbook contains the usual text, equations, and figures, but it also contains videos, animations, molecular structures that can be manipulated with your mouse, and other features. Mousing over a word will give you a definition, and clicking on an element name will take you to information about that element. We would like to hear from you about how you like these features and how you use them. You can pass the word along to the Student Board member from your section, email your comments to Prof. Keutsch, or enter comments into a forum in Moodle.

Because the textbook is online, you will be able to use it in new and different ways. Instead of making notes in the margin and highlighting different passages, you will be able to annotate your personal copy of the textbook and also to share your annotations with others in the class (or the world). The online tool that allows this is called **Diigo**. Diigo is a social bookmarking tool built for academics. Social bookmarking is a relatively new technology that involves storing your bookmarks, or links to websites, online and sharing them with others. Various sites, such as *del.icio.us* or *digg* allow users to access sites that others have found to be useful and share them. Diigo focuses on people who want to manage websites as research and learning tools. It allows you to store your bookmarks in personal Lists and to share bookmarks with specific Groups (such as the 109 class in general, your section, or just your study partners). It also allows you to highlight text online and to put sticky notes on these websites to be viewed later. You can make private annotations for your personal study, or share them with others. You can even put a sticky note online and ask your TA to respond to a question about something in particular in your online textbook.

Using Diigo. To use Diigo, you must register for their site. Registration and use of Diigo is not required as a part of 109, but it is highly encouraged. When you go to the [textbook website](#), you will find that instructions for using Diigo are part of the pathway called "How to Use This Site". That will take you through the process of registration and learning specific tools. Once you have registered, you should join the 109 group by going to this URL: http://groups.diigo.com/group/chem_109_fall_2012 and clicking on the orange-yellow "Join Group" button. You should be able to join the group automatically. You can also feel free to make your own groups, if you would like. One important note: Always be aware of whether you are posting sticky notes or highlights publicly, privately, or to certain groups. Until you get the hang of things, it is probably better to post to the 109 group rather than publicly.

Using Your Textbook. We recommend that you read the assigned sections of the textbook prior to each lecture. For the printed textbook, the sections to read are listed in the course schedule for the date of each lecture. In the online textbook, each section is identified by the date of a lecture, so you would read the section "W Sep 5" before lecture the first week of classes. Take the time to carefully review the illustrations, equations, animations, videos, and graphs in the online textbook. Visualization is an important tool that chemists use to understand the world, especially when thinking about molecular structure. Try to make your reading an active process; keep track of those concepts that are confusing, so you will be able to pay especially close attention as those concepts are covered in class. As soon as possible after class, try

to work the sample exercises without looking at the answers. When you understand the sample exercises, practice your problem solving skills by working the related online homework questions or the extra questions in the Chemistry 109 Study Questions Moodle site for that material. Many of these will be directly linked to the online textbook sections. Review the learning/exam objectives that relate to a given topic as you study.

Laboratory

Laboratory work is important to understanding and appreciating chemistry, and for those of us who love chemistry, lab work is really fun. The laboratory exercises are designed to illustrate the principles described in class, and the exams will include questions based upon the laboratory material. **To receive a passing grade in Chem 109, you must successfully complete all laboratory assignments and achieve an overall lab score of at least 60% .**

During the lab period you will carry out the experiment, take notes, and complete your data analysis. *All your work must be turned in at the end of your lab period, in the format specified in the lab manual or by your TA.* You will be evaluated on your pre-lab preparation, your in-lab experimental technique and data analysis, and on your ability to observe chemical phenomena and record your observations in your notebook. Each laboratory experiment will have its own criteria for grading and your TA will apply those criteria to evaluating your work.

Pre-lab Quizzes. Pre-laboratory Quizzes are available via [Moodle](#). You can take each Pre-lab Quiz twice and your higher score will count. Pre-lab Quizzes must be completed an hour before you go to your scheduled laboratory class; that is, if you have lab at 7:45 am on Tuesday, you must take the Pre-lab Quiz for that week before 6:45 am on Tuesday.

ChemPages Laboratory Resource ChemPages is an interactive, Web-based encyclopedia of laboratory techniques. You will be able to access ChemPages from any computer on the campus network either from the General Chemistry web page, <http://genchem.chem.wisc.edu/> under Materials for Lab, or from [Moodle](#) course homepage under Lab Stuff. ChemPages contains multimedia demonstrations of the laboratory techniques that you will use in this course. For almost every laboratory one or two ChemPages sections will be assigned—see your lab manual to find out which they are. You should view these pages before taking the Pre-lab Quiz, which must be completed an hour before your lab starts.

Discussion Section

Discussion sections are led by your Teaching Assistant for a group of 22 students. The discussion periods are for questions, help, review, and problem solving relevant to recent whole class sessions, homework, laboratory experiments, computer exercises, and other assigned material. Discussion sections will be most helpful if you are prepared when you come to the class. You should have at least tried to work out the homework problems or the objective-keyed study questions from the text. Feel free to bring a printed copy of your homework with you, marked with areas where you need help; your TA has been instructed not to solve the specific problems that you have been assigned, but he or she will have a similar example for the class to solve together. Bring specific questions to ask; be sure you understand the questions asked by others and the answers given by your TA and fellow students. Your active participation in discussion will help you and your fellow students learn.

Exams

There will be three evening midterm exams of approximately 75 minutes each and a 2-hour final exam. Each midterm exam will cover the classroom, special assignment, and laboratory material up to that point in the course and since the previous exam. The final exam will be divided approximately equally between the material since the third exam and comprehensive coverage of the entire semester.

An early exam will be given before each midterm at 3:30 PM for students who have conflicts with the assigned time. Please note the exam dates on your calendar and avoid scheduling anything at those times. If you have an unavoidable conflict, contact your professor well in advance. (We are aware of a recurring conflict with certain sections of engineering courses: if you have this conflict, please notify your TA and professor.)

Midterm Exams:	Monday, Sept. 24	5:40 PM to 7:00 PM
	Monday, Oct. 22	5:40 PM to 7:00 PM
	Monday, Nov. 19	5:40 PM to 7:00 PM
Final Exam:	Monday, Dec. 17	5:05 PM – 7:05 PM

The room in which you will take each exam will be announced later. A review session will be held in lecture class before each exam. ***No make-up exams will be given, but appropriate accommodation will be made for all students to be fairly evaluated.*** If you have any type of special need, options are available to take the exam at an alternate time or place; please contact Prof. Keutsch as soon as possible to make the arrangements.

Learning Objectives, Study Questions and Practice Exams Learning objectives for each exam, and a selected set of study questions keyed to the learning objectives, can be found in the Exam Preparation Materials panel on the course homepage in [Moodle](#). Exams given in Chemistry 109 in a prior year are available in the same location. The study questions are typical of those you should master and you should use them for extra practice in problem solving. In some

cases your online homework will suggest that you work on specific study questions to make sure you understand a concept. If you do not understand how to solve one or more study questions, ask your TA in discussion section or during office hours. For those using the online textbook only (as well as others), a set of on line study questions is available in the [Study Questions Course](#); anyone can use these questions as a study aid, but they are especially useful if you don't have access to the questions in the printed textbook.

How To Prepare For Exams A recommended strategy is: 1) review the learning objectives for the exam referring to your notes or the text if necessary, 2) work the study questions associated with each objective, spending more time working problems on those topics you find most challenging, 3) simulate the test taking situation by working the practice exam in 75 minutes in a quiet place, 4) have a partner "grade" your own test using the answer key as your guide while you "grade" the partner's work, 5) review those areas that you identify as weak, and then work the other questions on the practice test.

Online Homework

Each week you will have an online homework assignment in [Moodle](#). Each online homework assignment (except Review Homeworks and Homework 1) is *a triple assignment*: an *Early Online Homework* worth 2 points with mainly multiple-choice questions; an *Online Homework* worth 6 points with the same kinds of questions on the same topics as the early homework; and a *Challenge Quiz* worth 4 points with a very challenging question. These assignments are available only in Moodle and are listed under the week that they are due; they are also available through the Quizzes link. The Early Online Homework is due Wednesdays at 11:55 PM and can be done only once. If you get more than 50% correct you will receive the full 2 points; if you get less than 50%, you will receive whatever score is assigned. This homework is to encourage you to try the questions prior to your discussion section so that you can ask your TA about concepts you don't understand. The regular Online Homework is due every Sunday at 11:55 PM; you can attempt it twice and your higher score will count. The Challenge Quiz can only be done once. Online homework and Challenge Quizzes can be done from any computer on the campus network. For both online homework and Challenge Quizzes you are encouraged to form a study group and work with them to learn how to answer the questions; however, the work you submit must be your own.

It is wise to save your homework every 15 minutes or so. If there is some glitch, this will prevent loss of work. *To save, scroll to the bottom of the screen and click "Next."* Moodle will indicate which questions have been saved. You can then exit Moodle (without clicking "Submit all and finish") and when you return to Moodle and access the same homework, the same questions and all of the answers you saved will still be there. You can change saved answers and answer the rest of the questions.

There are several useful things to know about online homework. 1) You will not get the same questions as other students do, although most of the questions on your homework will be on the same topics as those for other students. The second time you do the homework, you almost certainly will get different questions, but similar to the first time, so you should read each question carefully and make certain you answer what is asked for. 2) You can start a homework, print a copy of the questions, exit from Moodle, answer the questions on paper, and go back at a later time to enter your answers into Moodle. 3) You are strongly encouraged to ask other students or your TA to help you to learn how to solve the types of problems found on the homework, but you must submit your own answers. 4) Until you click "Submit all and finish" you have not completed an assignment; don't forget to submit! 5) Don't wait until the last minute before the deadline.

In order for you to view the online homework and pre-lab quizzes, your computer must be configured appropriately.

We have provided a **Practice Quiz** that tests all the features you will need. You should do the practice quiz on the computer you expect to use for online homework and pre-lab quizzes to make certain that on your computer you are able to view everything you need to see. If you cannot answer correctly, the Practice Quiz will tell you how to fix the problem.

There are also three Review Homework assignments to help you review material that will not be explicitly discussed in Chem 109 and should have been learned in your high school chemistry course.

Challenge Quizzes

To provide questions similar to the most challenging questions on midterm exams, there is a Challenge Quiz (Challenge Problem) due at the same time as the online homework assignment. Challenge Quizzes will ask more complicated, open-ended questions that will challenge you to display your understanding through both calculations and explanatory text. Challenge Quizzes will be graded by your TA or lecturer and you will receive detailed feedback via email.

Computer Assignments

Each of the two computer assignments (Window on the Solid State; four Biomolecules Tutorials) has its own set of directions that will be mentioned in lecture and posted on the course Web site. It is your responsibility to obtain the directions from the course Web site, follow them, and turn each Computer Assignment in on time. The Computer Assignments are to be turned in to your TA at the time indicated on the assignment and in the Course Schedule. The second Computer Assignment is a set of four Biomolecules Tutorials, each worth 5 points, that you will need to work

through. Three Biomolecules Tutorials are due the same week and the fourth is due two weeks later; this is indicated in the course schedule. Each Biomolecules Tutorial has an accompanying quiz that you must complete successfully to receive credit for the tutorial. The score on the quiz is your score for the tutorial.

Important Administrative Information for Chemistry 109

Student Board of Directors

The Student Board of Directors helps Prof. Keutsch to run the course and provides feedback from students on how the course is going. The Board consists of one representative from each discussion/lab section, chosen from the students in that section. The board will meet nearly every week at 1:00 PM on Wednesdays to discuss course policies, structure, and content. Meetings will take from half an hour to an hour depending on how much we have to discuss. Your TA will solicit volunteers for this role in your first discussion. If you are interested in serving as your class representative, send Prof. Keutsch an email (chem109fk@chem.wisc.edu) as soon as possible explaining why you would like to be a member of the board. Include your name, your email address, and your discussion section number (501, 502, 503, etc.) in your message; if possible, include your TA's name.

Electronic Mail

All students at UW-Madison have access to free electronic mail through the university. We strongly recommend that while you are a student you use your @wisc.edu email address to send and receive email. You are encouraged to contact Prof. Keutsch by email if you have questions about anything to do with the course. Electronic mail is available at all times of day and night, so you can send messages whenever something comes to mind. Do not, however, expect immediate responses in the middle of the night! Prof. Keutsch's email address is chem109fk@chem.wisc.edu. Whenever you send an email to Prof. Keutsch, please indicate the subject of your email, such as "Homework 1, problem 4".

What To Do If You Are Sick, Or Otherwise Unable To Attend An Exam or Lab

If you are unable to attend a specific lab session because of an unavoidable schedule conflict (such as a religious observance, an athletic activity, or a family obligation), contact your TA as soon as possible to reschedule. Make-up lab times can be accommodated only during the week when the entire class is doing a lab exercise, so planning ahead is important. If you find that you are unable to attend lab because you are ill, contact your TA as soon as possible. He or she will discuss your situation and decide what to do. **If circumstances arise unexpectedly that preclude your taking an exam, please contact your TA and professor before the scheduled exam time.** We recognize that in an emergency situation, you may not be able to contact us in a timely way.

Chemistry Resource Facilities: Computer Room, Study Room, Undergrad Chemistry Office

Computers are available for use in room 1375 Chemistry. Room 1371 is a study room for chemistry students. The staff in the Undergraduate Chemistry Office, room 1328, can assist you with enrollment, advising, and many other things.

Cell Phone Policy

If you bring a cell phone to class or lab, please turn it off for the duration of the class or lab period. If circumstances require that you be able to answer your cell phone during a class, please inform your instructor before the class.

Academic Misconduct

Academic misconduct includes and is not limited to acts in which a student seeks to claim credit for the work or efforts of another without authorization or citation, uses unauthorized materials or fabricated data in any academic exercise, forges or falsifies academic documents or records, intentionally impedes or damages the academic work of others, engages in conduct aimed at making false representation of a student's academic performance, or assists other students in any of these acts. Examples include but are not limited to: cutting and pasting text from the web without quotation marks or proper citation; paraphrasing from the web without crediting the source; using notes when such use is not allowed; using another person's ideas, words, or research and presenting it as one's own by not properly crediting the originator; stealing examinations or course materials; changing or creating data in a lab experiment; altering a transcript; hiding a book knowing that another student needs it to prepare an assignment; collaboration that is contrary to the stated rules of the course, or tampering with a lab experiment or computer program of another student (read the UW-Madison statement [here](#)). Each student in this course is expected to work entirely on her/his own while taking any exam, to complete assignments on her/his own effort without the assistance of others unless directed otherwise by the instructor or teaching assistant. If you have any questions about an assignment, please ask. Academic misconduct either in lab or lecture can result in assignment of "F" by the course instructors as the final grade for the student and any additional actions mandated by University policy.

Academic misconduct applies to laboratory work as well. In your lab manual, be sure to read pages xxiii-xxiv, which deal explicitly with situations you may encounter in laboratory. Before you can work in the laboratory you need to pass a quiz on academic honesty with a perfect score.

Grades

Your grade will be based on a maximum of 1000 points divided as follows:

Sixteen Moodle Online Homeworks @ 8 points each <i>(see Course Assignment Schedule for due dates; includes both weekly and review homework assignments; homeworks 2-13 are divided into early, 2-point, and regular, 6-point sections)</i>	128 points
Thirteen online Challenge Quizzes @ 4 points each <i>(see Course Assignment Schedule for due dates, which are the same as for weekly online homeworks.)</i>	52 points
Twelve Laboratories will make up 24% of the course grade* <i>(each week's experiment is listed in the schedule; point total includes Pre-Lab Quizzes in Moodle; you must score 60% in lab to pass the course.)</i>	240 points
Two Computer Assignments <i>(directions for each available in Moodle)</i> Window on the Solid State (10 points) Biomolecules Tutorials and Quizzes: (four @ 5 points each; 20 points) <i>(due dates are listed in the schedule)</i>	30 points
Safety Quiz <i>(must be completed with a perfect score before your first lab)</i>	6 points
Academic Honesty Quiz <i>(must be completed with a perfect score before your first lab)</i>	4 points
Practice Quiz <i>(see course schedule for due date)</i>	6 points
TA Personal Evaluation <i>(based on discussion and lab work)</i>	34 points
Three midterm exams @ 100 points each <i>(dates and times are listed in the course schedule)</i>	300 points
Final Exam <i>(date and time are listed in the course schedule)</i>	200 points

Total	1000 points
-------	-------------

*Each lab exercise will be graded as described in the laboratory manual. At the end of the semester we will scale the total number of lab points to obtain your final lab point total. If necessary, some grades may be normalized upward to a common scale at the end of the semester to minimize differences in grading practices among discussion/lab sections.

Letter Grades.

Final grades will be based upon the absolute scale shown below. If you score the number of points indicated, then you will receive the letter grade indicated, regardless of how many other students achieve the same grade. There is no curve. Therefore it is to your benefit (and to your friends' benefit) that you help other students learn and they help you learn. After each midterm exam you will be able to determine your probable grade by totaling your earned points, dividing by the total points possible at that time, multiplying by 1000, and comparing with this list.

A	900 points or more
AB	870 to 899 points
B	810 to 869 points
BC	780 to 809 points
C	650 to 779 points
D	600 to 649 points

If necessary some adjustments will be made at the end of the semester, but these adjustments will never lower your final letter grade, only raise it. Past experience in Chem 109 is that the class average is about 3.1 on a four-point scale—above a B average.

Class, Laboratory, and Examination Schedule, Fall 2012

Date	Subject	Reading (Moore)	On-line Homework / Moodle	Laboratory / Moodle Pre-Lab Quizzes
<i>September</i>				
W 5	Introduction; Relation of Chemistry and Biosciences	Review Ch. 1, Ch. 2, Ch. 3 Sec. 1-2, 8-10, Ch. 4, 5, App A, B	Begin working on Moodle Practice Quiz, Review Homeworks 1 and 2, and Homework 1 (see due dates below).	No lab this week. Do attend discussion section this week.
F 7	Atomic Electronic Structure; Electron Configurations;	Ch.7, Sec. 1-7 Do reading before coming to lecture.	Moodle Practice Quiz and Review Homework 1 due Sunday, Sep 9 , at 11:55 PM. Moodle Online Homework and Moodle Challenge Quiz are both <i>due Sunday by 11:55 PM each week.</i>	Work on Moodle online quizzes: Safety, Acad. Honesty, and Zinc and Iodine Pre-lab.
M 10	Ion Electron Configs; Paramagnetism	Ch.7, Sec. 8		Citizenship in the Lab talk. Come to lab starting Tuesday, Sept. 11. Purchase lab manual, notebook, goggles; prepare for lab next week
W 12	Periodicity of Atomic Prop.; Ionic Bonding;	Ch 7, Sec 9-13; Ch.3, Sec. 5-7	Several tutorials are available via the Tutorials link in Moodle. These tutorials are optional but will be helpful for review of material you learned in high school. For this week, work on Fundamentals of Chemistry: Measurement Tutorials and Stoichiometry Tutorials.	
F 14	Solid-State Structures; Prop. Ionic Cpds.	Ch. 11, Sec. 5-7;	Online Homework 1, Challenge Quiz 01 due Sunday, Sep 16 at 11:55 PM	
M 17	Covalent Bonding; Lewis Structures	Ch. 8, Sec. 1-5	Work on optional Chemical Reactions Tutorials this week. Work on Homework 2, Challenge Quiz 02, and Review Homework 2 (due Sun.)	Check In; Zinc and Iodine experiment; complete Safety, Acad. Honesty, and Zinc and Iodine quizzes before lab (3 quizzes; <i>perfect score required for Safety, Acad. Hon.</i>)
W 19	Structures of Hydrocarbons; Isomerism	Ch.3, Sec. 3-4	Early Online Homework 2 due tonight, 11:55 PM	
F 21	Review for Exam 1		Online Homework 2, Challenge Quiz 02, and Review Homework 2 due Sunday, Sep 23 at 11:55 PM	Window on the Solid State, Parts 1-4 (access tutorial through Moodle); due week of Sept. 24 at start of your lab
M Sept. 24	Exam 1 (5:40 – 7:00 PM, location to be announced); Ch. 3 (Sec. 3.3-3.7); Ch. 7 (all); Ch. 8 (Sec. 8.1-8.5); Ch. 11 (Sec. 11.5-11.7); Labs: Zn + I₂. Review material from two review homeworks and Ch. 1-5.			

Date	Subject	Reading	Online Work/Moodle	Laboratory
<i>September</i>				
M 24	Covalent Bonding; Bond Properties	Ch.8, Sec. 6-7	Work on Online Homework 3, Challenge Quiz 03 (due Sunday)	Modeling Solid Structures/Alum Crystals Moodle Pre-lab quiz before lab. (Window on Solid State due at start of lab this week.)
W 26	Formal Charge; Resonance; Exceptions to Octet Rule; Aromatic Compounds	Ch. 8, Sec. 8-11	Early Online Homework 3 due tonight, 11:55 PM	
F 28	Molecular Shapes; VSEPR, Hybridization	Ch.9, Sec. 1-3	Online Homework 3, Challenge Quiz 03 due Sunday, Sep 30 at 11:55 PM	
<i>October</i>				
M 1	Structure and Polarity; Noncovalent Interactions	Ch. 9, Sec. 4-6	Work on Online Homework 4, Challenge Quiz 04 (due Sunday)	Hydroxyapatite Moodle Pre-lab quiz completed before lab
W 3	Organic Chemistry; Fuels; Structure and Properties	Ch. 12, Sec. 1-3	Early Online Homework 4 due tonight, 11:55 PM	
F 5	Functional Groups: Alcohols; Carboxylic Acids	Ch. 12, Sec. 4-5	Online Homework 4, Challenge Quiz 04 due Sunday at 11:55 PM	
M 8	Condensation reactions;	Ch. 12, Sec. 5	Work on Online Homework 5, Challenge Quiz 05 (due Sunday)	Molecular Structures Moodle Pre-lab quiz
W 10	Addition Polymers; Condensation Polymers	Ch. 12, Sec. 6,	Required biomolecules tutorials and quizzes in Moodle due at start of lab next week. Early Online Homework 5 due tonight, 11:55 PM.	Proteins 1, Proteins 2, DNA 1 (in Tutorials in Moodle)
F 12	Structures of Biomolecules and Biopolymers	Ch. 3, Sec. 11; Ch.12, Sec. 7; Ch. 9, Sec. 7	Online Homework 5. Challenge Quiz 05 due Sunday at 11:55 PM	
M 15	Rates of Reactions Measuring Rates	Ch. 13, Sec. 1-2	Biomolecules tutorials and quiz Proteins 1, Proteins 2, DNA 1 (in Tutorials in Moodle) due at start of lab this week.	Biomolecules (<i>This is not the next experiment in the manual; it begins on p 7-1.</i>) Moodle Pre-lab quiz
W 17	Rate Laws; Elementary Reactions	Ch. 13, Sec. 3-4	Early Online Homework 6 due tonight, 11:55 PM	
F 19	Review for Exam 2		Online Homework 6, Challenge Quiz 06 due Sunday at 11:55 PM	
M Oct. 22	Exam 2 (5:40 – 7:00 PM, location TBA); Covers Ch. 3 (Sec. 3.11), Ch. 8 (Sec. 8.6-8.11), Ch. 9 (all), Ch. 12 (all), Ch. 13 (Sec. 13.1-13.4). Labs: Solid Structures/Alum Crystals, Window on Solid State, Hydroxyapatite, Molecular Structures, Biomolecules			

Date	Subject	Reading	Online Work/Moodle	Laboratory
<i>October</i>				
M 22	Effect of Temperature	Ch. 13, Sec. 5	Work on Online Homework 7, Challenge Quiz 07 (due Sunday)	Prep. of Aspirin and Flavoring Esters Moodle Pre-lab quiz
W 24	Rate Laws for Elem. Reactions; Mechanisms of Reactions	Ch. 13, Sec. 6-7	Early Online Homework 7 due tonight, 11:55 PM	
F 26	Multi-step mechanisms	Ch. 13, Sec. 8	Online Homework 7, Challenge Quiz 07 due Sunday at 11:55 PM	
M 29	Catalysis: Enzyme, Industrial	Ch. 13, Sec. 9-10	Work on Online Homework 8, Challenge Quiz 08 (due Sunday)	Iodine Clock Reaction Moodle Pre-lab quiz
W 31	Thermochemistry and calorimetry; Enthalpy and Hess's Law	Review Chapter 6	Early Online Homework 8 due tonight, 11:55 PM	Biomolecules tutorial Enzymes and quiz due at start of lab next week.
<i>November</i>				
F 2	Reactant/Product-Favored Processes	Ch. 18, Sec. 1-2	Online Homework 8, Challenge Quiz 08 due Sunday at 11:55 PM	
M 5	Entropy	Ch. 18, Sec. 3	Biomolecules tutorial Enzymes and quiz due at start of lab this week. Work on optional Thermodynamics Tutorial	Enzyme Kinetics Moodle Pre-lab quiz
W 7	Entropy and the Direction of Change	Ch. 18, Sec. 4-5	Early Online Homework 9 due tonight, 11:55 PM	
F 9	Gibbs Free Energy	Ch. 18, Sec. 6	Online Homework 9, Challenge Quiz 09, Review Homework 3 due Sunday at 11:55 PM	
M 12	Chemical Equilibrium; Determining Equilib. Consts	Ch.14, Sec.1-3	Work on Online Homework 10, Challenge Quiz 10 (due Sunday)	Le Chatelier's Principle (no pre-lab quiz)
W 14	Using Equilibrium Constants; Le Chatelier's Principle	Ch. 14, Sec. 4-6, 8	Early Online Homework 10 due tonight, 11:55 PM	
F 16	Review for Exam 3		Online Homework 10, Challenge Quiz 10 due Sunday at 11:55 PM	
M Nov. 19	Exam 3 (5:40 – 7:00 PM; location to be announced); Covers Chapter 6 (review), Chapter 13 (Sec. 13.5-13.10), Chapter 14 (except Sec. 14.7) and Chapter 18 (Sec. 18.1-18.6); Lab: Aspirin, Iodine Clock, Enzyme Kinetics, Le Chatelier's Principle			

Date	Subject	Reading	Online Work/Moodle	Laboratory
<i>November</i>				
M 19	Gibbs Free Energy and K_{eq}	Ch.18, Sec. 7-8		Thanksgiving week—no lab
W 21	Gibbs Energy and Biological Systems; Thermodynamic and Kinetic Stability	Ch.18, Sec. 9-11	Work on optional Acids and Bases Tutorials this week and next	
F 23	Thanksgiving Break, Nov. 22-25		Thanksgiving Break	Thanksgiving Break
M 26	Acids and Bases	Ch.16, Sec. 1-3	Work on Online Homework 11, Challenge Quiz 11 (due Sunday)	Discovering Electrochemistry (no pre-lab quiz)
W 28	Acid-Base Equilibria	Ch. 16, Sec. 4-5, 7	Early Online Homework 11 due tonight, 11:55 PM	
F 30	Acidity and Molecular Structure	Ch.16, Sec. 6, 8	Online Homework 11, Challenge Quiz 11 due Sunday at 11:55 PM	
<i>December</i>				
M 3	Lewis Acids and Bases; Buffer Solutions	Ch. 16, Sec. 9-10; Ch. 17, Sec. 1	Work on Online Homework 12, Challenge Quiz 12 (due Sunday)	Chemical Equilibrium and Thermodynamics of a Ligand Substitution Reaction; Moodle Pre-lab quiz
W 5	Titration and Titration Curves	Ch.17, Sec. 2	Early Online Homework 12 due tonight, 11:55 PM	
F 7	Electrochemistry; Electrochemical Cells; Cell Voltage	Ch.19, Sec. 1-4	Online Homework 12, Challenge Quiz 12 due Sunday at 11:55 PM	
M 10	Reduction Potentials; Reduction Potentials and ΔG	Ch.19, Sec. 5-7	Work on Online Homework 13, Challenge Quiz 13 (due Friday—not Sunday)	Titration Moodle Pre-lab quiz; Check out
W 12	Practical cells; Electrolysis	Ch.19, Sec. 9-12	End of Semester Survey due Saturday, Dec. 15, at 11:55 PM; Early Online Homework 13 due tonight, 11:55 PM	
F 14	Special Summary Lecture	Study for final exam	Online Homework 13, Challenge Quiz 13 due TODAY at 11:55 PM	Optional Moodle Review Homework for final available until 12:00 noon Tuesday, Dec 18.

FINAL EXAM: Monday, Dec. 17, 5:05-7:05 PM. Rooms to be announced. Approximately half of the final covers all material in the course, and the other half covers material since the third midterm exam.