

# CHEMISTRY 109

Lecture 1, Spring 2016

**Read This Syllabus Today. Keep It for Future Reference.**

Advanced General Chemistry:	5 credit hours
Class time:	8:50 AM MF 1361 Chemistry 8:50 AM WR 2425 or 3425 Sterling Hall
Instructor Information:	Professor John W. Moore 1305 Chemistry (262-5154) <a href="mailto:jwmoore@chem.wisc.edu">jwmoore@chem.wisc.edu</a>
Office Hours:	MWRF 9:40-10:15 AM; F 2-3 PM 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, mathematical and 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, provided 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. Prof. Moore and your TA will do their best to guide you in mastering the material, but no course or instructor can learn for you. 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 this: 1) work through the assigned material in the textbook (following the process demonstrated the first day of class) before each class session, 2) always attend class and participate fully in the discussion activities 3) as soon as possible after class, begin to work homework problems. When you encounter problems that you cannot solve, refer to the textbook, video lectures, a tutorial, or your fellow students. Forming a study group to work through problems is an excellent way to learn chemistry. As you study the textbook, make notes about questions you have or points you don't understand; such questions can be entered in Piazza (see below) so that an instructor or a fellow student can help you gain insight.

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 Friday, January 22, and the second Sunday, January 31. The third comes Monday, March 28. 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 online 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 may become available from time to time to cover material introduced for the first time this year.

This course is designed to help you to learn as much chemistry as possible and to perform at the highest possible level. I found this online post to be helpful in providing insights into what is needed if you want to be the best of the best:

[http://www.entrepreneur.com/article/247518?utm\\_source=MailingList&utm\\_medium=email&utm\\_campaign=150619](http://www.entrepreneur.com/article/247518?utm_source=MailingList&utm_medium=email&utm_campaign=150619)

## 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* 5<sup>th</sup> ed. Moore, Stanitski + OWLv2 w/ 24 Months MindTap eReader (you can get either a hardbound book or 3-hole punched pages that you would put in a notebook).

**Lab Manual:** *Chemistry 109 Laboratory Manual, Fall 2015*, Chemistry Department, University of Wisconsin-Madison: available in the Chemistry Computer Room (room 1375 on the first floor) during the first two weeks of classes.

**Lab Notebook:** Carbonless laboratory notebook with duplicate pages: available in room 1375 with the lab manuals.

**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 with lab manual or from 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 <https://mynetid.wisc.edu/activate>, and following the directions. You may change your NetID password at <https://www.mynetid.wisc.edu/modify>.

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 January 17. If you did not receive such an email, either you were not yet enrolled or you 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*.

## Moodle Web Site; OWLv2

Much of Chem 109 is only available via a course management system called **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 <https://ay15-16.moodle.wisc.edu>. Click Login at the upper right on the screen; enter your NetID and Password. Choose Spring 2015-2016 and click Chem 109.

Homework in this course is provided online via **OWLv2**. An OWLv2 access code should have been purchased with your textbook. In Moodle you will find directions for registering for OWLv2 (OWLv2 Info and Registration pull down). View the [Registration Video](#) as soon as possible and then use the link in Moodle that corresponds with your discussion section number (521, 522, etc.) to login to OWLv2 and get to know the system. **When you register for the first time in OWLv2, use your @wisc email for your email address and use your NetID as your Student ID.**

Each week a set of OWLv2 problems will be assigned for homework and there will be optional assignments as well. There are **five OWLv2 Prep Assignments** (1 pt each) that you should do before you start any other OWLv2 assignment: (1) Intro: System Setup; (2) Intro: Assignment Types; (3) Intro: Answering Questions; (4); Intro: ChemDoodle Sketcher and (5) Math Review. Complete these as soon as possible. Then begin to work on **Review Homework 1**, which is **due at 11:55 PM Friday, Jan 22** and on **Homework 1**, which is **due at 11:55 PM on Tuesday, Jan 26**.

## Safety Quiz and Academic Honesty 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 first 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. The relevant pages in the lab manual for the Academic Honesty Quiz are xxiii to xxiv.*

## 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. Moore 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, go to Chem 109, and use the Course Info and other pull-down menus 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. Many of these activities are assigned point values and must be done. Others are optional: you can sample the different types of materials offered and to select those activities that most effectively support your learning. In the lecture, Prof. Moore will lecture, do chemical demonstrations, and point out the important things to be learned each week. In discussion section, you will do individual exercises with your laptop computer, work with a small group of students in problem solving, and arrive at group explanations for concepts. In lab you will explore chemical principles through hands-on experimentation. To supplement these activities, online tutorials are provided to aid your mastery of the material. Attendance at the lectures and the discussion sections is 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 on Monday and Friday Prof. Moore 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. You need to write more than just what Prof. Moore writes on the chalkboard. If there are particular concepts or ideas that are not clear to you, feel free to ask Prof. Moore or your TA about them during class, after class using Piazza, during office hours, or during an appointment meeting. 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. As soon as possible after lecture practice your problem solving skills by working the related online homework questions.

### **Textbook.**

We require that you work through the assigned sections of the textbook prior to each class; the sections to read are listed in the course schedule for the date of each class. Make your reading an active process; read with pencil, paper, and calculator at hand and work through each Problem-Solving Practice problem and each Exercise in the textbook. Keep track of concepts that are confusing and write down questions that occur to you about the material. (If further reading does not provide answers to your questions, submit them through Piazza; your TA, Prof. Moore, and other students will be reading those questions and providing answers.) The questions you write should suggest topics for you to pay especially close attention to in class. During class every Friday there will be significant time devoted to the topics that most students found difficult that week.

### **Active-Learning Discussion Sections**

Classes on Wednesday and Thursday are active-learning sessions led by your Teaching Assistant for a group of 36 students. These classes will be held in Sterling Hall rooms 2425 (sections 521 and 522) or 3425 (sections 523 and 524). During the discussion sections you will need to use a laptop or tablet to work on OWLv2 lessons. You will be seated at a table with six other student so that you can work them with and discuss critical thinking questions during the class. If you don't have a laptop or tablet, you can borrow one from the University Library. To help Prof. Moore and the TAs to learn your names you will have a name card to display at your place at the table. These cards are your responsibility to keep and bring to each active-learning discussion class.

Prior to the Wednesday class you must work through the textbook material assigned for that week and complete a Pre-Discussion Worksheet designed to ensure that you are prepared to participate in the class discussions. The worksheet must be handed to your TA at the start of class every Wednesday. During class you will have a Discussion Activities Worksheet that will organize your work. Your active participation in discussion will help you and your fellow students learn. We have done an educational experiment that reveals that students in active-learning discussion sections achieve higher exam scores than students in more traditional discussion sections, which is why we have organized these sections as we have.

**Pre-Discussion Worksheets.** For each discussion section there is a Pre-Discussion Worksheet available in [Moodle](#). You must turn in your completed worksheet at the beginning of the discussion section class period. Your TA will grade the worksheet on this basis: no worksheet or worksheet turned in late, 0 points; some questions answered correctly, 1 point; all questions answered correctly or only one question incorrect, 2 points.

**Discussion Activities Worksheet.** The Discussion Activities Worksheets are also available in [Moodle](#). Each worksheet contains five to seven activities. In an activity you usually will first do an individual exercise on your laptop and then work with one or two partners on critical thinking questions about the exercise or about a topic closely related to the exercise. For some activities you and your fellow students will be encouraged to write on a whiteboard to develop the solution to a problem or to work together to write a group explanation of a phenomenon or theory and then discuss your

group's work with your TA. If your TA is not available right away when you are ready to discuss a result, just let your TA know you are ready and start working through the next activity.

## 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%.** Coming to laboratory well prepared and strictly following all safety instructions given by your TA is an important prerequisite to safely complete this mandatory laboratory assignment. When in the laboratory you must act in a professional manner.

During the lab period you will carry out the experiment, take notes, and complete your data analysis. 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 2:25 PM on Monday, you must take the Pre-lab Quiz for that week before 1:45 PM on Monday.

**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 Resources > 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 that must be completed an hour before your lab starts.

## 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.

Please note the exam dates on your calendar and avoid scheduling anything at those times. If you have an unavoidable conflict, contact your TA and professor well in advance.

Midterm Exams:	Monday, Feb 8	7:15 PM to 8:35 PM
	Monday, Mar 7	7:15 PM to 8:35 PM
	Monday, Apr 11	7:15 PM to 8:35 PM
Final Exam:	<b>Sunday, May 8</b>	<b>12:25 PM – 2:25 PM</b>

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. Moore 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. If you do not understand how to solve one or more study questions, ask your TA, post a question in Piazza, or ask Prof. Moore.

**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 on topics you find more 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.

## Online Homework: OWLv2

Each week you will have an online homework assignment in OWLv2. Except for the first weeks of the semester and at Spring Break, Online Homework is due every Sunday at 11:55 PM. 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. Two of them are due during the first and third weeks of classes; the third one is due in March. Online homework can be done from any computer with internet access. For online homework you are encouraged to form a study group and work with the group to learn the principles needed to answer the questions; however, the work you submit must be your own.

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 a question it will almost certainly be different, so you should read each question carefully and make certain you answer the questions you get the second time, not the ones you remember from the first time. 2) You are strongly encouraged to ask other students, Prof. Moore, 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 to your specific questions. 3) Things that puzzle you about the homework can be entered as Piazza Questions at any time. 4) It is possible to save your homework assignment and come back to it later. Use the “Save and Exit button to do this. If you are interrupted and can’t finish an assignment, be sure to save it so as not to lose your work. 4) Each question in an assignment has a Submit Answer button. You have not completed a question until you click Submit Answer. 5) Until you click Finish Assignment you have not completed an assignment; don’t forget to click Finish Assignment before you close your browser. 6) Don’t wait until the last minute before the deadline.

## Computer Assignments

Each of the three computer assignments (Excel Assignment; Window on the Solid State; four Biomolecules Tutorials, each with online quiz) 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 in each Computer Assignment 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 third 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.

## Student Advisory Board

The Student Advisory Board helps Prof. Moore 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 Thursdays to discuss course policies, structure, and content. Meetings will take from 20 to 40 minutes depending on how much we have to discuss. If you are interested in serving as your class representative, send Prof. Moore an email ([jwmoore@chem.wisc.edu](mailto:jwmoore@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 (521, 522, 523, or 524) in your message; also, include your TA’s name if possible.

## Communicating with Your Professor

There are two types of communications: individual questions/comments that are intended to be seen only by you and your instructor (such as the reason you need to miss a class) and questions about chemistry content where the responses will be useful to everyone in the class.

**Individual Questions about Course Organization.** For the first type of communication we strongly recommend that you use your @wisc.edu email address to send and receive email and forward your other email accounts to the @wisc.edu account. You are encouraged to contact Prof. Moore by email if you have questions about anything to do with the operation of the course. Prof. Moore’s email address is [jwmoore@chem.wisc.edu](mailto:jwmoore@chem.wisc.edu). Whenever you send an email to Prof. Moore, please begin the subject line with “109:”. This can be followed by whatever the subject of the message is, such as “Conflict with Exam 2 time” or “Grade on first exam”. Using 109 in the header will differentiate course emails from the many other emails that Prof. Moore receives. As a reminder, a professional email contains a proper salutation, a concise description of the background and a well articulated question. Emails that do not follow these criteria may not be answered.

**Questions about Chemistry Topics.** For this type of communication use Piazza. To access Piazza, use the link in [Moodle](#). Piazza is a wiki-like question-and-answer system in which you can enter your chemistry question and it can be answered by another student in the class, by a TA, or by Prof. Moore. In Piazza you will find a set of categories. Choose the one that best fits your question and enter your question there. The Piazza system makes it possible for anyone else in the course to answer your question, so you can expect a response fairly soon no matter when you enter your question. Please use Piazza for all chemistry questions.

## 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. You also need to hand in a tear-out page in the lab manual on which you certify that you have read and understand the academic misconduct policies.

## Grades

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

<b>Five OWLv2 Prep Assignments @ 1 point each</b> (1) Intro: Answering Questions; (2) Intro: Assignment Types; (3) Intro: ChemDoodle Sketcher; (4) Intro: System Setup; (5) Math Review (due Wednesday, Jan 20 at 11:55 PM)	5 points
<b>Eighteen OWLv2 Online Homeworks @ 7 points each</b> (see Course Assignment Schedule for due dates; includes both weekly and review homework assignments)	126 points
<b>Fifteen Pre-Discussion Worksheets @ 2 points each</b> (due at start of Wednesday discussion section each week)	30 points
<b>Safety Quiz and Academic Honesty Quiz</b> two Moodle quizzes @ 4 points each (must be completed with a perfect score before your first lab)	8 points
<b>Thirteen Laboratories @ 20 points each</b> (including pre-lab quizzes)* (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.)	260 points
<b>Three Computer Assignments</b> (directions for each available in Moodle) Window on the Solid State (5 points) Excel Assignment (5 points) Biomolecules Tutorials and Quizzes (four @ 5 points each; total 20 points) (due dates are listed in the schedule)	30 points
<b>Beginning Assessment, Midsemester Survey, Ending Survey @ 4 points each</b> (see Course Assignment Schedule for due dates)	12 points
<b>TA Personal Evaluation</b> (based on discussion and lab work)	29 points
<b>Three midterm exams @ 100 points each</b> (dates and times are listed in the course schedule)	300 points
<b>Final Exam</b> (date and time are listed in the course schedule)	200 points
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Total	1000 points

\*Each lab exercise will be graded as described in the laboratory manual. 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, Spring 2016**

<b>Date</b>	<b>Topics</b>	<b>Reading</b>	<b>Video</b>	<b>Online: <a href="#">Moodle</a> / <a href="#">OWL</a></b>	<b>Laboratory / Moodle Pre-Lab Quizzes</b>
W 1-20 Chem 1361	Introduction; Review of chemistry you should already know.	Review Ch. 1 Sec. 1-15; Ch. 2, Sec. 1-3, 10-12; Ch. 3 all Secs.; Appendix A, B	These optional video lectures are for review or to enhance understanding. 1 Light	<b>OWL Intro Assignments (all four)</b> due tonight at 11:55 PM. Begin working on Review Homework 1 and Homework 1 (see due dates below).	<b>Attend all lecture and discussion classes this week. No lab</b> this week. Purchase lab manual, notebook, goggles.
R 1-21 Sterling Hall 2425 or 3425	Atomic Spectra; Wave Properties; Atomic Energy Levels	Do <b>before</b> each class. Ch. 5, Sec. 1-6	2 Waves 3 E Levels 4 H At E Lev 5 Electron W 6 Particle-in-	<b>Pre-Discussion Worksheet 01</b> is due at start of class today	Work on Moodle online quizzes: <b>Safety, Acad. Honesty</b> both due in lab next week. (These are in Moodle, not OWL.)
F 1-22 Chem 1361	Electron as a Wave; Quantum Numbers; Energy Levels; Electron Density; Atomic Orbital Shapes		7 E-lev Diag 8 Elec. Prob. 10 Elec. H At 1: H At Quan 12 Elec Scree 13 Elec Spin 17 Quan Nos	<b>OWL Math Review and OWL Review Homework 1</b> due tonight at 11:55 PM	<b>Come to lab starting Monday, Jan. 25. Hand in Lab Worksheet at start of lab.</b> Start to work on <b>Zinc and Iodine Pre-lab Quiz</b> , due 1 hour before lab next week.
M 1-25 Chem 1361 <b>Prof. J.R. Schmidt</b> <b>Beginning Assessment</b>	Electron Configurations; Ion Electron Configs; Paramagnetism	Ch. 5, Sec. 7-8	14 C At Elec 15 E-lev Diag 16 At Orb Sh 18 Elec Cnfg 19 Paramag	<b>OWL Homework 1 (HW#1)</b> due <b>Tuesday, Jan. 26</b> at 11:55 PM Start working on <b>OWL Homework 2 (HW#2)</b> and <b>Review Homework 2</b> , both due <b>Sunday, Jan. 31</b> at 11:55 PM	Check In; Lab Orientation: where things are in the lab. <b>Zinc and Iodine</b> experiment. Pre-lab quiz due 1 hour before lab.
W 1-27 Sterling Hall	Periodic Variation of At. Radii, I.E., E.A.; Eff. Nuclear Charge; Ionic Bonding; Prop. Ionic Cpds.	Ch. 5, Sec 9-13; Ch. 2, Sec. 4-6	20 Per Prop 21 Ionic Cpds 22 Prop Ionic 23 Form LiH 24 Ionic Radii	<b>Pre-Discussion Worksheet 02</b> is due at start of discussion today. <b>Window on the Solid State, Parts 1-4</b> (5 pts, access tutorial through Moodle); <b>due Monday, Feb 1 at start of class.</b>	

<b>Date</b>	<b>Topics</b>	<b>Reading</b>	<b>Video</b>	<b>Online: <a href="#">Moodle</a> / <a href="#">OWL</a></b>	<b>Laboratory / Moodle Pre-Lab Quizzes</b>
R 1-28 Sterling Hall	Covalent Bonding; Molecular Orbitals;	Ch. 6, Sec. 1, Sec. 12 (parts a and b only)	25 Cov Bond 26 Molec Orb		
F 1-29 Chem 1361	Wrap-up Session			<b>Homework 2 and Review Homework 2 both due Sunday, Jan 31 at 11:55 PM</b>	
M 2-1 Prof. Danny Fredrick- son	Solid-State Structures; Lewis Structures	Ch. 9, Sec. 4 (parts a and b), Sec. 6 and 7; Ch. 6, Sec. 2, 4;	26 Molec Orb 28 Bond Struc	<b>Window on Solid State</b> (5 pts) due at start of class today. <b>Work on Online Homework 3</b> (due <b>Sunday, Feb 7</b> at 11:55 PM)	<b>Modeling Solid Structures/Alum Crystals.</b> Pre-lab quiz due 1 hour before lab.
W 2-3	Structures of Hydrocarbons; Isomerism	Ch. 6, Sec. 3; Ch.2, Sec. 7-9	29 Conform 30 Isomers	<b>Pre-Discussion Worksheet 03</b> due at start of class today.	
R 2-4	Alkenes; Alkynes; cis- trans isomers	Ch. 6, Sec. 5	31 Reactivity Triple Bond	Start Excel Assgt. (directions in Moodle) Part 1 due next week.	
F 2-5	Wrap-up Session Review for Exam 1			<b>Online Homework 3 due Sunday at 11:55 PM</b>	
<b>M Feb 8</b>	<b>Exam 1. 7:15 – 8:35 PM, location to be announced; Ch. 2 (Sec. 4-9); Ch. 5 (all); Ch. 6 (Sec. 6.1-6.5, parts a and b of Sec. 12); Ch. 9 (Sec. 9.4 parts a and b, 9.6, 9.7); Labs: Safety; Zn + I<sub>2</sub>; Modeling Solid Structures; Review material from two review homeworks, Ch. 1-3, Appendixes A and B.</b>				
M 2-8 Prof. Bob McMahon	Bond Length; Bond Energy Bond Polarity; Electronegativit y	Ch.6, Sec. 6-7		Work on <b>Online Homework 4</b> (due Sun).	<b>Hydroxyapatite</b> Pre-lab quiz due 1 hour before lab.
W 2-10	Formal Charge; Resonance; Exceptions to Octet Rule	Ch. 6, Sec. 8-10		<b>Pre-Discussion Worksheet 04</b> due at start of discussion today;	