

CHEMISTRY 103

FALL 2014

Lecture 1:	MWF 11:00-11:50 a.m. in Chemistry 1351
Lecture 5:	MWF 8:50-9:40 a.m. in Chemistry 1351
Lecturer:	Dr. Linda Zelewski
Email:	zelewski@wisc.edu (Please sign any email messages with your name, your TA's name and your discussion or lab section.)
Office:	Room Chemistry 7108 (Take the elevator in the lobby at the corner of Johnson St. and Charter St. up to the 7 th floor.)
Office Hours:	Wednesday 1:00-3:00 p.m. in Chemistry 7108
Problem Solving Sessions:	Monday 5:30-7:00 p.m. in Chemistry 1371
Website:	https://learn@uw.wisc.edu
General Chemistry Homepage:	http://genchem.chem.wisc.edu
Undergraduate Chemistry Office:	Chemistry 1328, 263-2424
Chemistry Study Room:	Chemistry 1371
Chemistry Computer Room:	Chemistry 1375

Chemistry 103 is the first semester course in a two-semester sequence. This course has been designed with the expectation that students will also take Chemistry 104. Chemistry 103 and 104 provide a general background concerning the principles and factual basis of chemistry and serve as a prerequisite for advanced courses such as Organic Chemistry (341 or 343), Analytical Chemistry (327 or 329), and Inorganic Chemistry (311). A suitable algebra placement test score or completion of Math 112, Math 114, Math 171 or equivalent is a prerequisite for the course. One year of high school chemistry is recommended.

REQUIRED MATERIALS

Textbook: *Chemistry: The Central Science with MasteringChemistry Technology Kit*, 12th edition by Brown, LeMay, Bursten, Murphy and Woodward, available at the University Bookstore. You may purchase the hardcover edition, a less expensive unbound edition, or an e-text version of the book (available with a MasteringChemistry account).

Mastering Chemistry Access Code: Required to access on-line homework assignments. MasteringChemistry access codes are bundled with new textbooks. If you purchase a used textbook or receive a textbook from another student, you must purchase your own access code to the MasteringChemistry system online at <http://www.masteringchemistry.com>. Instructions on how to register and join the course are given on the course homepage on Learn@UW. The course ID for Lecture 1 is CHEM103LEC1ZELEWSKI. The course ID for Lecture 5 is CHEM103LEC5ZELEWSKI.

i>clicker or i>clicker +: Available at local bookstores. Bring your clicker to every lecture. Your clicker must be registered in every class in which you use it. *To register your clicker for Chemistry 103, go to our homepage on Learn@UW and click on "Register Your i>clicker".*

Lab Manual: *Chemistry 103 Laboratory Manual*, Fall 2014, Department of Chemistry, UW-Madison, available in the chemistry building lobby from Alpha Chi Sigma during the first two weeks of class (\$20, cash only).

Lab Notebook: Carbonless laboratory notebook with duplicate pages, available from Alpha Chi Sigma and local bookstores.

Safety Goggles: Industrial quality eye protection is *required* at all times when you are in the lab. Safety goggles that fit over regular glasses can be purchased from local bookstores. Contact lenses should not be worn in laboratory because fumes or splashes may be trapped between them and your eyes.

Calculator: An inexpensive calculator having capabilities for square roots, logarithms and exponentiation (antilogarithms) and exponential (scientific) notation operations is required. The calculator will be used on homework assignments, exams and in the lab. A programmable calculator may be used on exams as long as no information is stored on it such as chemical formulas or equations. It must be of the type allowable on an ACT or SAT exam (no cell phone or iPod calculators). You must clear the memory before entering the exam room.

USB Drive: A USB flash drive that will hold at least 2 GB is required for laboratory data collection.

COURSE INFORMATION

This course has been designed and organized to help you learn chemistry. Your lecturer 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.

The majority, but not all of the students in Chemistry 103, are first semester freshmen. You will find several differences between this course and most of your high school courses. Perhaps the biggest difference is the amount of time you will need to devote to this course. Not counting in-class time, you should expect to spend anywhere from 8 to 12 hours per week. Some of you may need more or less depending on your academic background and native ability. In order to keep up, you may need to work on improving your studying and time management skills. Also, spending some time on chemistry every day is much more effective than one or two marathon blocks of time a week.

A recommended study strategy for this course is: 1) read the assigned readings from your textbook before each lecture, 2) attend class and take your own notes, 3) review your notes and fill in any missing information in your notes using the TA lecture notes posted on Learn@UW or your textbook, and 4) begin to work homework problems as soon as possible after reading each chapter section. When you encounter problems that you cannot solve, refer to the textbook and its example problems, your notes, a Mastering Chemistry tutorial, or your fellow classmates. Forming a study group to work through problems is an excellent way to learn chemistry. Use the “chapter summary and key terms”, “key equations” and “key skills” at the end of each chapter to help you focus on key points.

LECTURE AND DISCUSSION

Lecture: During lectures, I will introduce principles and illustrate concepts with examples and demonstrations. A lecture cannot describe or explain everything you need to learn; rather, it will indicate what topics are important to study and provide insight into those topics. Please read the assigned sections of the textbook prior to lecture and take your own notes during the lecture. Sample lecture notes taken by a TA will be posted on Learn@UW (click on “Content” in the toolbar) within two days after each lecture.

Lecture Demonstrations: The UW-Madison Chemistry Department has a longstanding tradition of using lecture demonstrations to help students understand chemistry. When a demonstration is done in class, observe what happens and make certain you understand the principles the demonstration is designed to illustrate. If you do not, ask questions, either in lecture or in your discussion section. All demonstrations are important and questions about demonstrations may appear on exams.

Classroom Etiquette: Cell phones should be turned off or silenced. While laptops are not prohibited in class, you will not have any need for them during lecture. Using the computer or other devices during class for activities not related to class (such as surfing the web, playing video games, texting, etc.) is both rude and distracting, not only for you, but for those who are sitting nearby. Our lecture room desks are very noisy when raised or lowered, so please wait until the instructor is completely done speaking before you lower your desk at the end of class. As much as possible, class will be dismissed when the bell rings, but sometimes another minute or two may be needed to finish up. Please be considerate of your classmates.

Student Board: As an instructor, I value your feedback. In order to establish a direct line of communication, I would like to assemble a Student Board that meets with me for approximately 30 to 45 minutes every other week to discuss issues related to Chemistry 103. The Board will consist of one representative from each discussion section.

- If you are in Lecture 1 and your schedule is open at 12:05 p.m. on Wednesdays (right after lecture) and you are interested in representing your discussion section, please let your TA know as soon as possible.
- If you are in Lecture 5 and your schedule is open at 9:55 a.m. on Wednesdays (right after lecture) and you are interested in representing your discussion section, please let your TA know as soon as possible.

i>clickers: The purpose of using clickers in lecture is to reinforce concepts and to encourage student engagement. By answering lecture questions using your clicker, you can earn up to 15 points toward your final grade. Bring your clicker with you to every lecture.

In order to get credit for answering clicker questions, you must register your clicker by clicking on the link on our Learn@UW homepage. When you respond to a clicker question in lecture, your clicker sends its ID number and your letter response to a base at the front of the lecture hall. Registering your clicker tells me what clicker ID number belongs to you. If you do not register your clicker, I will not be able to give you credit for your vote.

Each student in the course must have their own unique clicker ID, meaning it is not possible for you to share a clicker with another student in either lecture section. While you are you are strongly encouraged to attend the lecture in which you are enrolled, if you attend my other lecture, you will receive credit for your clicker vote.

In order to compensate for circumstances in which you may have to miss lecture due to an illness or another legitimate reason, forget to bring your clicker to lecture, or your battery dies, you will earn full credit (15 points) toward your final grade if you answer a minimum of 80% of the lecture questions using your clicker. If you answer less than 80% of the questions, you will earn (% questions answered \times 1.25 \times 15) points. For example, if you answer 40% of the questions, you will earn $0.40 \times 1.25 \times 15 = 7.5$ points. You do not need to get the question correct in order to earn credit for participating.

Discussion: Twice a week, you will meet with a TA and your classmates for discussion. During these meetings you will discuss assigned homework problems, work on exercises, learn about upcoming

laboratory assignments, and have an opportunity to ask questions. Bring specific questions to discussion as it is a great opportunity for you to learn from your TA and fellow classmates.

Discussion Quizzes: Your weekly discussion will incorporate periodic quizzes. These quizzes are important opportunities to evaluate your progress in the course. Your TA will go over the quiz immediately afterwards and you will grade your quiz; however, you will receive full credit as long as you complete the quiz and turn it in to your TA. Missed quizzes cannot be made up; however, you will earn full credit (15 points) toward your final grade if you complete a minimum of 80% of the quizzes.

Exams: There will be three mid-term exams given during the lecture period, and one final exam. **Mark these dates on your calendar now. NO MAKE-UP EXAMS WILL BE GIVEN. If you have a religious conflict with any of these exam dates, you must report the conflict to your TA within the first two weeks of classes.**

Midterm Exams	Exam 1	Wednesday, September 24	In class
	Exam 2	Wednesday, October 22	In class
	Exam 3	Wednesday, November 19	In class
Final Exam	Lecture 1	Wednesday, December 17	12:25-2:25 p.m.
	Lecture 5	Saturday, December 20	10:05 a.m.-12:05 p.m.

Exams will include questions on material covered in lecture, discussion, laboratory, and assigned readings. The final exam will cover topics from the entire semester. One week prior to each exam, a set of Exam Objectives will be posted on Learn@UW, which will outline the material you will be tested on.

Homework: Problem solving is a crucial aspect of this course and homework problems will be assigned on a regular basis. There will be 11 MasteringChemistry homework assignments, and your highest 10 scores will count toward your grade. Homework assignments will be posted seven to ten days before the due date, which will allow you ample time and flexibility to complete each assignment. Homework problems can be accessed directly through www.masteringchemistry.com, or you can link to this site from our Learn@UW homepage. For most problem sets, a subset of the problems will be required, supplemented with additional recommended practice problems. In addition, most problem sets will have a few extra credit problems. The maximum score for each homework assignment is 7.5 points, but these extra credit problems can offset small errors and difficulties associated with using the MasteringChemistry software. You can log on multiple times to complete an assignment. **For questions with multiple parts, you must answer all parts of the question in order to get credit for that problem.** It is your responsibility to make sure you have completed the entire question before the due date.

Homework assignments and due dates are posted on MasteringChemistry and can also be found under Weekly Assignments on Learn@UW. **All homework assignments must be completed by 11:59 p.m. on the day of the week it is due. No extensions to the due date will be given, and you will not receive credit for late submissions.** If you are unable to complete a homework assignment before the deadline for any reason, including illness or a family emergency, depending on how much of the problem set you were able to complete and the rest of your homework grades, this assignment may be your dropped score. Once the due date is past, you can still access homework problems; however, you will not receive points in the course for completing them.

If you encounter technical difficulties with MasteringChemistry pertaining to how answers are submitted/accepted or why you did not get credit for an answer that was actually correct, please send an email to chem103homework@chem.wisc.edu with your name, course number, and a brief description of the problem. The person receiving your email message receives email from students in

other chemistry courses, so it is essential to include your course number (103-1 or 103-5) in your email message. The person receiving your email message will *not* be able to answer content-related questions. If you have content-related questions, please ask your TA.

LABORATORY

The laboratory is a vital part of this course. In lab, you will develop skills that are not easily learned or demonstrated in the lecture hall. These skills include:

- Designing experiments
- Learning proper laboratory techniques
- Using laboratory equipment properly
- Interpreting and analyzing data
- Communicating your ideas through discussions with others and writing

YOU MUST ACHIEVE A MINIMUM SCORE OF 60% IN LAB IN ORDER TO RECEIVE A PASSING GRADE IN THE COURSE.

Before you will be allowed into lab to complete the Solutions and Density lab, you must take and pass the Safety Quiz and the Academic Honesty Quiz with a perfect score on Learn@UW.

- Read the Safety section in your *Chemistry 103 Laboratory Manual* on pages xix-xxii and take the Safety Quiz on Learn@UW (click on “Quizzes” in the toolbar). There is no limit on the number of times you can take the quiz.
- Read the Statement on Academic Integrity in your *Chemistry 103 Laboratory Manual* on pages xxiii-xxiv and take the Academic Honesty Quiz on Learn@UW (click on “Quizzes” in the toolbar). There is no limit on the number of times you can take the quiz. In addition to completing the quiz, you must complete the form following page xxiv in your lab manual and give the form to your TA.

Laboratory Assignments: While most of the labs are conducted in the laboratory, three are computer based assignments done outside the lab. Instructions for the labs and a description of the grading rubric are described in the lab manual.

Laboratory Preparation: Before coming to lab you need to

- Read “Preparing for the Experiment” in the lab manual, and carry out the directions given. Note that online quizzes for most experiments are available on Learn@UW as a resource. ***These laboratory quizzes are not a graded component of this course.***
- Review relevant sections of your textbook.
- View the appropriate ChemPages on the web.
- Prepare your laboratory notebook. Before coming to lab, write a short summary statement and procedural outline of the experiment (see page xi in your lab manual for more information on what this entails), make tables to record experimental data, leave areas to record experimental observations, do any pre-lab calculations, and answer any prelab questions. An example of a prepared notebook is provided in the lab manual on pages xxxv to xli.

Your TA will check your notebook at the beginning of the lab session to make sure these requirements are met. ***If you arrive without a properly prepared notebook, you will be asked to leave the lab to correct this.*** In addition to losing performance points (20% of your lab grade), you will not receive credit for the part of the lab you were unable to complete because you were unprepared.

Safety in the Laboratory: The "Safety" section of the lab manual covers general safety precautions for all experiments. Each experiment also has a "For Your Safety" section with specific precautions that you should read before coming to lab. Failure to follow proper safe laboratory practices, including not wearing safety goggles, may lead to you being ejected from the laboratory and receiving zero credit for the experiment.

Laboratory Attendance: You are required to attend the lab section in which you are enrolled and to arrive on time. Your TA will review safety information and any modifications to the experiment at the start of the lab period. If you are late and miss part or all of your TA's lab briefing, you will lose performance points (up to 20% of your lab grade). *If you arrive 30 minutes or more past the start time of your lab, you will not be allowed into lab to perform the experiment.*

Unless you are formally excused, you must attend all laboratory sessions. There are no procedures to make-up laboratories you miss, and a grade of zero will be recorded for all unexcused absences.

If you have a religious conflict, UW athletic commitment, UW field trip for another course, or other legitimate school related reason for missing lab, *you must report the conflict to your TA a minimum of two weeks before the absence occurs, receive confirmation from your TA that your absence meets the requirements for being excused, and make arrangements with your TA to make up the lab.* If you are seriously ill or have a family emergency and are unable to attend lab, inform your TA as soon as possible via email and make arrangements with your TA to make up the missed lab.

Laboratory Reports: For most experiments, reports are due at the end of the laboratory period. No late reports will be accepted when the lab is due at the end of the lab period. *If you place a computer lab report in your TA's mailbox, it is your responsibility to send your TA an email notifying them.* Lab reports turned in without email notification may not be accepted for credit.

LEARN@UW

Much of the material for this course is only available via our Chemistry 103 Learn@UW webpage (<https://learnuw.wisc.edu/>). The site contains assignments and due dates, schedules, office hours, TA lecture notes, PowerPoint slides, course handouts, announcements, and other materials. Check this site frequently throughout the semester.

GRADES

Point Distribution: If no changes are made, the total number of points you can earn is 588. The point distribution is detailed below. Minor adjustments may be made during the semester if needed. You will be advised of any changes.

Laboratory	108 points
Homework (highest 10 of 11 at @ 7.5 points each)	75 points
Discussion Quizzes	15 points
Clicker Participation	15 points
3 Midterm Exams @ 75 points each	225 points
Final Exam	150 points

Your letter grade will be determined by calculating your final percentage using the formula:

$$\% \text{ score} = (\text{total points earned} / \text{total possible points}) \times 100\%$$

Lab grades will be normalized to a common scale before final grades are determined to minimize differences in grading practices between laboratory sections.

If UW-Madison closes due to bad weather on the day of the final exam and the final exam is canceled, your average midterm exam grade will be used as your final exam grade when calculating your final grade.

Intended Grading Scale: Letter grades will be assigned at the end of the semester based on the following intended grading scale:

A	90.0%
AB	88.0%
B	80.0%
BC	78.0%
C	70.0%
D	60.0%

This scale may be adjusted downward at the end of the semester, depending on the overall class average. It will never be adjusted upward. At the end of the semester, if the average class grade is less than 80%, the grading scale will be lowered so the average course grade is at the B/BC cut-off and the grade distribution is consistent with historical Chemistry 103 final grade distributions.

Review Your Grades: All grades will be entered electronically in Learn@UW. Be sure to review your scores regularly and notify your TA promptly of any discrepancies. *Any discrepancies must be brought to your TA's attention before the final exam. After final grades have been released to the Registrar, no changes to grades will be made.*

ACADEMIC MISCONDUCT

It is expected that all students will conduct themselves with honesty, integrity, and professionalism. ***Any student caught cheating on an exam will receive a grade of zero on the exam.*** This penalty includes incidents such as looking at another student's paper during an exam or altering an exam after it has been graded and then submitting it for re-grading. ***Any student caught cheating on a lab report (for instance, copying another person's work, bringing lab notebook pages from another student to the lab or fabricating data) will receive a zero for that assignment.*** A second infraction will result in an F for the course. More information on what constitutes academic misconduct and UW policies on handling misconduct can be found at: <http://www.wisc.edu/students/saja/misconduct/UWS14.html> and http://writing.wisc.edu/Handbook/QPA_plagiarism.html.

You are responsible for understanding what constitutes academic misconduct. If you do not understand, you should consult the websites above, or discuss this further with your TA. Note that if an assignment is completed as a group (for example, a group lab report or research paper), all group members are responsible for ensuring that the assignment meets the standards for academic conduct. All group members who contributed to an assignment that is found to violate the standards for academic honesty will be held equally responsible. If you are placing your name on an assignment, it is your responsibility to ensure that assignment was completed with integrity. If you believe that a member of your lab group is committing academic misconduct, you should notify your TA. Students who assist other students in committing academic misconduct are also in violation of UWS 14.

RESOURCES

Numerous resources are available to assist you with this course and college life in general. It is up to you to take advantage of these resources to ensure your success both in this course and at UW-Madison.

Course Web-site on Learn@UW (<https://learnuw.wisc.edu/>): The site contains weekly assignments, due dates, schedules, office hours, TA lecture notes, course handouts, and other materials.

General Chemistry Web Site (<http://www.chem.wisc.edu/content/genchem-main/>): Resource materials for general chemistry students are available on the General Chemistry website. ChemPages, and other lab resources are accessed via the "Materials for Laboratory" link.

Office Hours: Office hours are set times during the week when course instructors are available to answer your questions. *All office hours are open to all students in the course.* My office hours are on Wednesday from 1:00-3:00 p.m. in Chem 7108. You can also ask me questions during the Problem Solving Sessions on Monday from 5:30-7:00 p.m. in Chem 1371. TA office hours are posted on Learn@UW.

Problem-Solving Sessions: Meet with your fellow students to work together on solving homework problems on Monday from 5:30-7:00 p.m. in Chem 1371. Several TAs and I will be at each problem-solving session to answer questions.

Study Groups: You are strongly encouraged to form small groups that get together outside of class to work on homework and laboratory assignments. A study group reflects the teamwork inherent in the way modern science is normally carried out at academic institutions – namely, scientists often collaborate with one another, either within the same university and/or with individuals or groups elsewhere. However, it is important to realize that although you may collaborate with other students on assignments, the work you turn in must be your own. It has been found that students who interact with one another via study groups do significantly better in mastering the material in this course.

Tutoring Services: A number of tutoring resources are available on campus, some free and some for a fee. For more information, see our Learn@UW site or the General Chemistry home page.

Advising and Counseling Services (University Health Services): College life can be stressful. If you are struggling with your academic course load or other academic issues, your advisor is a good resource. If you are struggling emotionally with anxiety, depression, or other health issues, individual counseling is available at University Counseling and Consultation Services. For more information go their website (<http://www.uhs.wisc.edu/services/counseling/>) or call 265-5600. Crisis intervention services are also available 24 hours a day by dialing this same phone number and pressing option 9.

Health or Disability Concerns: All students are entitled to an accessible, accommodating and supportive teaching and learning environment. The McBurney Disability Resource Center (263-2741) provides resources for students with disabilities. You will need to provide documentation of your disability to the McBurney Center in order to receive official university services and accommodations. *If you need accommodations for this course, please contact me and your TA early in the semester to discuss arrangements.*

CHEMISTRY 103 OUTLINE AND CALENDAR

Dates for lecture topics are approximate. The exam dates are fixed. Specific reading assignments and a complete listing of all assignments and due dates are posted on our course website on Learn@UW.

WEEK	DATE	LECTURE TOPIC	CH.	LAB
1	Sep 1	<i>Labor Day-No Classes</i>		Citizenship in the Lab
	Sep 3	Matter and Measurement	1	
	Sep 5	Atoms, Molecules and Ions	2	
2	Sep 8	Atoms, Molecules and Ions	2	<i>No Lab</i>
	Sep 10	Atoms, Molecules and Ions	2	
	Sep 12	Stoichiometry	3	
3	Sep 15	Stoichiometry	3	Solutions, Density and Graphing
	Sep 17	Stoichiometry	3	
	Sep 19	Reactions in Aqueous Solution	4	
4	Sep 22	Review		<i>No Lab</i>
	Sep 24	EXAM 1		
	Sep 26	Reactions in Aqueous Solution	4	
5	Sep 29	Reactions in Aqueous Solution	4	Reaction of Zinc and Iodine
	Oct 1	Reactions in Aqueous Solution	4	
	Oct 3	Thermochemistry	5	
6	Oct 6	Thermochemistry	5	Reaction Types and Chemical Logic (Computer Exercise)
	Oct 8	Thermochemistry	5	
	Oct 10	Thermochemistry	5	
7	Oct 13	Thermochemistry	5	Solution Calorimetry
	Oct 15	Electronic Structure of Atoms	6	
	Oct 17	Electronic Structure of Atoms	6	
8	Oct 20	Review		<i>No Lab</i>
	Oct 22	EXAM 2		
	Oct 24	Periodic Properties of the Elements	7	
9	Oct 27	Periodic Properties of the Elements	7	Synthesis of an Alum
	Oct 29	Periodic Properties of the Elements	7	
	Oct 31*	Chemical Bonding	8	
10	Nov 3	Chemical Bonding	8	<i>No Lab</i>
	Nov 5	Chemical Bonding	8	
	Nov 7	Chemical Bonding	8	
11	Nov 10	Chemical Bonding	8	Light, Color and Solutions
	Nov 12	Molecular Geometry	9	
	Nov 14	Molecular Geometry	9	
12	Nov 17	Review		Molecular Geometry and WebMO (Computer Exercise)
	Nov 19	EXAM 3		
	Nov 21	Gases	10	
13	Nov 24	Gases	10	<i>No Lab</i>
	Nov 26	Office Hour		
	Nov 28	<i>Thanksgiving Recess-No Classes</i>		
14	Dec 1	Gases	10	Project Lab
	Dec 3	Solids and Modern Materials	12	
	Dec 5	Liquids and Intermolecular Forces	11	
15	Dec 8	Liquids and Intermolecular Forces	11	A Window on the Solid State (Computer Exercise)
	Dec 10	Liquids and Intermolecular Forces	11	
	Dec 12	Review		
FINAL EXAMS	Dec 14-20	Lecture 1: Wednesday, December 17 (12:25-2:25 p.m.) Lecture 5: Saturday, December 20 (10:05 a.m.-12:05 p.m.)		

*Last day to drop classes.