

Chemistry 103-1 – Fall 2013

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Office Hours:	M 12:05 – 12:55 pm & by appointment
Lectures:	MWF @ 11:00 am, Room 1351 Chemistry
Labs:	Room 2325 Chemistry
Course Website on Learn@UW:	https://learnuw.wisc.edu/
Website for Homework:	http://www.masteringchemistry.com/
General Chemistry Office:	Room 1328 Chemistry
General Chemistry Homepage:	http://genchem.chem.wisc.edu/

INTRODUCTION

Chemistry 103 is the first course in a two-semester General Chemistry sequence, the second course being 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 chemistry courses, such as Organic Chemistry (341 or 343), Analytical Chemistry (327 or 329), and Inorganic Chemistry (311). We require that freshmen students place at least at the level of Math 113 before taking Chemistry 103. Most Chemistry 103 students have had some high school chemistry. If you have not, or if you experience any difficulty despite attending class and completing all assignments, you should contact me *early* in the semester.

REQUIRED MATERIALS

- ✓ **Textbook:** *Chemistry: The Central Science*, 12th edition by Brown, LeMay, Bursten, Murphy, and Woodward. This is a custom edition for UW, available at the University Bookstore. Although a few used copies may be available, we have obtained a significantly reduced price for this special edition. You may purchase either the hardcover edition or the less expensive unbound edition.
- ✓ **Class Handouts:** PowerPoint presentations with the most important figures from the textbook will be used extensively in this class. All of the slides will be made available to you for printing on the Learn@UW course web page before they are being discussed in class. The slides will have enough space for you to write down all of the information from the blackboard.
- ✓ **Electronic RF “Clicker”:** The lectures will make use of student “voting” on concept tests, surveys, and other questions. You will need to buy a radio-frequency (RF) iClicker and bring it to every lecture. The iClicker can be purchased at the University Bookstore.
- ✓ **Lab Manual:** *Chemistry 103 Laboratory Manual*, Fall 2013, Department of Chemistry, UW-Madison; sold in Chemistry building lobby by the chemistry fraternity Alpha Chi Sigma during the first two weeks of classes. The cost is \$20 and only cash is accepted.
- ✓ **Lab Notebook:** 100-page carbonless lab notebook; available at local bookstores and in the Chemistry building where lab manuals are sold.
- ✓ **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 at local bookstores. *Contact lenses should not be worn in the laboratory* because fumes or splashes may be caught between them and your eye. Please inform your TA if you absolutely have to wear contact lenses in the lab. A complete list of safety rules can be found in the lab manual.

- ✓ **Calculator:** An inexpensive calculator having capabilities for square roots, logarithms, exponentiation (antilogarithms), and scientific notation is required. The calculator will be used on homework assignments, quizzes, exams, and in the lab. A calculator allowing you to run programs and store information other than simple numbers in the memory is allowed during exams as long as it is only used for simple mathematical calculations.
- ✓ **MasteringChemistry Account for Homework:** This is bundled with your new textbook for no additional charge. Instructions for registering are given on the course homepage on Learn@UW. If you purchased a used textbook or received one from another student, you must purchase your own access to the MasteringChemistry system online at: <http://www.masteringchemistry.com>.

LECTURE AND DISCUSSION

Lecture: Important principles will be presented during lecture and many concepts will be illustrated with examples and demonstrations. The lecture is not intended to describe or explain everything you will learn in the course; rather, it will highlight important areas to study and give you an opportunity to think about concepts and understand them further. You should read the relevant material in the textbook both before and after coming to lecture and take your own notes during lecture. PowerPoint presentations will be used extensively in this class; all the slides will be made available to you for printing on Learn@UW before they are being discussed in class. Although a set of lecture notes taken by a Teaching Assistant (TA) will be available on Learn@UW, these notes are meant to supplement, not replace, your own notes. If you are interested in some pointers on good note-taking habits, I recommend you visit this [site](#). You are strongly discouraged from using a laptop computer for taking notes, as you will need to draw graphs, reaction schemes, etc. Using a computer or similar devices during lecture for activities not related to the class (such as surfing the web, playing video games, etc.) is both rude and extremely distracting. Also, please silence or turn off cell phones upon entering the lecture hall and refrain from talking on your phone, composing text messages, and reading the newspaper during class.

Many of you are first-semester freshmen. You will find several significant differences between your high school courses and this course. Perhaps the biggest difference is the amount of time you should expect to put into this course, which ranges from 8-12 hours of outside of class studying per week. In order to keep up, it is essential that you work on improving your studying and time management skills. 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, re-read the textbook and begin to work on 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; that is, a vocabulary of chemistry. This course includes a range of activities that are aimed at facilitating the learning process. These activities are described below.

Demonstrations: Demonstrations will sometimes be used to illustrate important concepts. Be sure to observe carefully what happens and make certain that you understand the principles the demonstration is designed to illustrate. If you do not, ask questions, either in lecture or in your discussion section. Questions about demonstrations may appear on quizzes and exams. These questions will focus on understanding the demonstration, as opposed to memorizing a result. For example, "Explain what was happening when the solution turned blue" might be asked, instead of "What color was observed?"

Textbook. The textbook supplements the lectures. It provides background material for the lectures and also works out many relevant examples. In addition, at the end of each chapter are a number of problems, and in the appendices are answers to selected problems. For an understanding of the material in this course it is important to solve as many of these problems as possible. Plan to buy your own textbook. A reference copy of the textbook is available for consultation in the Chemistry library.

Discussion Section: You will meet with about 22 of your classmates and your Teaching Assistant (TA) twice a week for discussion. During these meetings, you will discuss and solve problems related to the assigned readings and homework, learn about upcoming laboratory assignments, and have an opportunity to ask questions. You will benefit most from discussion if you have prepared ahead of time. You should have already read the relevant material and worked some problems. Bring specific questions to discussion, as it is a great opportunity for you to learn from your TA and fellow classmates.

Homework: Problem solving is a crucial aspect of this course. Most weeks are you expected to complete a homework assignment that will be administered online via the MasteringChemistry system. The deadline for homework assignments is typically Tuesday at midnight. Each homework assignment will have enough problems to earn 150+ points; you will receive full credit by accumulating at least 100 points. However, you are encouraged to work on additional problems even after you obtained 100 points. You can log on multiple times to complete the assignment. See Learn@UW for more information on the MasteringChemistry online homework system.

Quizzes: Quizzes will be administered during the last 20 minutes of the second discussion period of most weeks. Missed quizzes may not be made up, except under extenuating circumstances. One quiz score will be dropped at the end of the semester when grades are determined (see below).

LABORATORY

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

- Using laboratory equipment properly
- Analyzing and interpreting data
- Designing experiments
- Working with others
- Communicating your ideas through discussions with others and writing lab reports

Note: *You must successfully complete the laboratory assignments to receive a passing grade for this course.*

Laboratory Assignments: There are a total of nine lab assignments. While most of the labs are conducted in the laboratory, three of them are computer-based assignments completed outside the lab. Instructions for the labs and a description of the grading rubric are described in the lab manual. The lab schedule is included with the Course Schedule at the end of this syllabus.

Laboratory Preparation: In order to properly prepare for a lab, you need to i) read the instructions in the Lab Manual; ii) review relevant sections of your textbook if concepts are unclear; iii) view the appropriate ChemPages Laboratory Resources on the web; and iv) write an introduction and procedural outline in your lab notebook. If you fail to complete any of these steps you will NOT be allowed into the laboratory!

Pre-lab Quizzes: For most experiments, you can take a pre-lab quiz administered via Learn@UW. The quiz should be completed at least one hour before coming to lab; however, you are encouraged to attempt the quiz 24 hours or more before your lab so that you have time to solve any technical problems that might arise. No credit will be given for these pre-lab quizzes.

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.

Attendance: You must attend all laboratory sessions unless you have a valid excuse. Make-ups can only be scheduled under rare circumstances. A grade of zero will be recorded for unexcused absences. If you need to miss a lab, notify your TA as soon as possible, preferably before the lab period.

Reports: For most experiments, reports are due at the end of the laboratory period unless your TA specifies otherwise. Points may be deducted if reports are turned in late.

RESOURCES

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

Your Instructors: *Your TAs and I are here to help you!* We all have regularly scheduled office hours and can also be contacted via email. Don't hesitate to contact me if you have questions or concerns about the course or the work you are doing. I will respond to all email messages (brunold@chem.wisc.edu) either directly or, when appropriate, in the following lecture. I also welcome questions after lecture and I am available by appointment. *Please include your TA's name and section number in all your emails.*

Course Web-site and Learn@UW (<https://learnuw.wisc.edu/>): Our course website can be accessed via Learn@UW. The syllabus, schedules, office hours, TA lecture notes, course handouts, announcements, and grades will all be available on Learn@UW. Pre-lab quizzes will also be administered via Learn@UW. *You should visit the site on a daily basis.*

General Chemistry Web Site (<http://genchem.chem.wisc.edu/>): Resource materials for general chemistry students are available on the General Chemistry website. The computer laboratory exercises, ChemPages, and other lab resources are accessed via the "Materials for Labs" link. Copies of old exams from this and other lecturers will be made available before exams in the "More for Students" section.

Study Groups: You may collaborate with other students on homework assignments and laboratory discussion questions. Study groups reflect the teamwork inherent in the way modern science is done; that is, scientists frequently collaborate with others, either within the same department or at a distance with persons in other cities, states, or countries. It is important to realize that while you may collaborate with other students on assignments, the work you turn in must be your own. *Thus, you must turn in an individual write-up (not a copy of the study group's work) for assignments.*

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 (<http://genchem.chem.wisc.edu/>) under the "More for Students" section.

Students with Disabilities: Appropriate accommodations for lecture, laboratory, discussion, and/or exams can be arranged for students with disabilities. The McBurney Disability Resource Center (<http://www.mcburney.wisc.edu/>) can provide assistance. *Students needing special accommodations for this class should schedule a confidential meeting with me as soon as possible to discuss arrangements.*

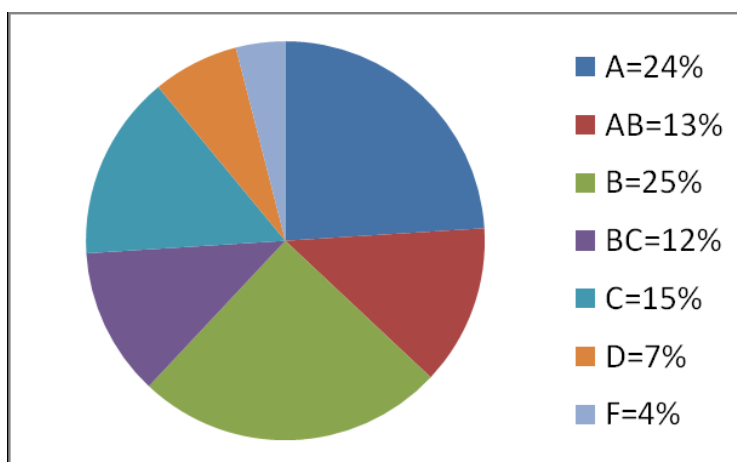
Advising and Counseling Services (University Health Services): College life can – and probably will – be stressful at times. If you are struggling with your academic course load or other academic issues, your advisor is a good resource. If you are struggling emotionally with anxiety, depression, or other health issues, individual counseling is available at University Counseling and Consultation Services. For more information go to their website (http://www.uhs.wisc.edu/home.jsp?cat_id=36) or call 265-5600. Crisis intervention services are also available 24 hours a day by dialing this same phone number and pressing option 9.

GRADES

Point Distribution: This course will be graded on a maximum of 900 points as follows:

Clicker Participation (>80% for full credit)	20 points
Quizzes (best 9 of 10 @ 10 points each)	90 points
11 Homework Assignments (10 points each)	110 points
Laboratory	170 points
Online Course Survey(s)	10 points
3 In-Class Mid-Term Exams (100 points each)	300 points
Final Exam	200 points

Your final course grade will be based on your relative total of accumulated points compared to the rest of the class. The approximate distribution of final grades is given below. The top 24% of the scores will receive A's and so forth. It is important to note that the distribution will be adjusted upwards if class performance exceeds our expectations. Thus, you are not directly competing against other students. In fact, you are almost certain to earn a better grade if you work with, and help, other students. An important difference between this course and many high school courses is that the grades you receive on the exams, quizzes, homework assignments, and laboratories determine your final grade. One cannot improve this grade by performing additional work.



Approximate Distribution of Final Grades

Exams: There will be three mid-term exams given during our regular lecture period. The final exam will cover topics from the entire semester. Exam locations will be announced later. The exam schedule is:

Exam #1	Wednesday, Sept. 25	11:00 – 11:50 a.m. (in class)
Exam #2	Monday, Oct. 21	11:00 – 11:50 a.m. (in class)
Exam #3	Monday, Nov. 18	11:00 – 11:50 a.m. (in class)
Final Exam	Friday, Dec. 20	10:05 a.m. – 12:05 p.m.

Review Your Grades: Your grades will be available on the Learn@UW course website. Be sure to review your scores regularly and notify your TA promptly of any discrepancies. Do not wait until the end of the semester to request corrections.

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 an F in the course. Any student caught cheating on homework, a quiz, or lab (for instance, copying another person's work 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>

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 necessary arrangements. **If you have special needs, please make an appointment to speak to your professor and 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.

DISCUSSION AND LABORATORY SECTIONS

	<i>Discussion Period</i>		<i>Laboratory</i>		<i>TA</i>
301/601	3:30 pm MW	2307 Chem	7:45-10:45 T	2325 Chem	Rebekah Blakney
302/602	4:35 pm MW	2307 Chem	7:45-10:45 R	2325 Chem	Rebekah Blakney
303/603	1:20 pm MW	2307 Chem	7:45-10:45 T	2325 Chem	Nathan Neff-Mallon
304/604	2:25 pm MW	2307 Chem	7:45-10:45 R	2325 Chem	Nathan Neff-Mallon
305/605	1:20 pm MW	2373 Chem	11:00-2:00 T	2325 Chem	Zhilin Yang
306/606	2:25 pm MW	2373 Chem	11:00-2:00 R	2325 Chem	Zhilin Yang
307/607	7:45 am TR	2373 Chem	11:00-2:00 T	2325 Chem	Grayson Jackson
308/608	8:50 am TR	126 Chadbourne	11:00-2:00 R	2325 Chem	Grayson Jackson
309/609	11:00 pm TR	1225 Ogg Hall	2:25-5:25 T	2325 Chem	Leslie Rank
310/610	12:05 pm TR	49 Sellery Hall	2:25-5:25 R	2325 Chem	Leslie Rank
311/611	1:20 pm MW	2385 Chem	2:25-5:25 T	2325 Chem	Benjamin Smith
312/612	2:25 pm MW	138 Witte Hall	2:25-5:25 R	2325 Chem	Benjamin Smith
313/613	2:25 am TR	2307 Chem	7:45-10:45 W	2325 Chem	Elizabeth Blaesi
314/614	3:30 am TR	2307 Chem	7:45-10:45 F	2325 Chem	Elizabeth Blaesi
315/615	11:00 am TR	2311 Chem	7:45-10:45 W	2325 Chem	Nuru Stracey
316/616	12:05 pm TR	2311 Chem	7:45-10:45 F	2325 Chem	Nuru Stracey

Desk numbers and E-mail addresses of TAs:

Desk 5	Rebekah Blakney	blakney@wisc.edu
Desk 3	Nathan Neff-Mallon	neffmallon@wisc.edu
Desk 4	Zhilin Yang	zyang@chem.wisc.edu
Desk 4	Grayson Jackson	gjackson@wisc.edu
Desk 2	Leslie Rank	lrnk@wisc.edu
Desk 2	Benjamin Smith	blsmith4@wisc.edu
Desk 5	Elizabeth Blaesi	eblaesi@chem.wisc.edu
Desk 3	Nuru Stracey	stracey@wisc.edu

Chemistry 103-1 (Brunold) – Course Schedule

Week	Date	Topic	Text Chapters	Homework & Quiz	Lab
1	4-Sep W	Matter and Measurements	1	<i>no HW/Q</i>	Citizenship in the Lab
	6-Sep F	Atoms, Molecules, & Ions	2.1 – 2.5		
2	9-Sep M	Atoms, Molecules, & Ions	2.6 – 2.9	HW1, Q1	<i>no lab</i>
	11-Sep W	Stoichiometry	3.1 – 3.4		
	13-Sep F	Stoichiometry	3.5 – 3.7		
3	16-Sep M	Reactions in Aqueous Solution	4.1 – 4.3	HW2, Q2	Solutions, Density & Graphing (wet lab)
	18-Sep W	Reactions in Aqueous Solution	4.4 – 4.6		
	20-Sep F	Reactions in Aqueous Solution			
4	23-Sep M	Catch-Up & Review for Exam 1		<i>no HW/Q</i>	<i>no lab</i>
	25-Sep W	EXAM #1: 11:00 to 11:50 a.m. (during lecture) →Covers Ch. 1–4; Rooms TBA			
	27-Sep F	Thermochemistry	5.1 – 5.2		
5	30-Sep M	Thermochemistry	5.3 – 5.5	HW3, Q3	Zinc and Iodine (wet lab)
	2-Oct W	Thermochemistry	5.6 – 5.8		
	4-Oct F	Catch-Up & Problem Solving			
6	7-Oct M	Electronic Structure of Atoms	6.1 – 6.6	HW4, Q4	Reaction Types & Chemical Logic (computer lab)
	9-Oct W	Electronic Structure of Atoms	6.7 – 6.9		
	11-Oct F	Periodic Properties	7.1 – 7.3		
7	14-Oct M	Periodic Properties	7.4 – 7.6	HW5, Q5	<i>no lab</i>
	16-Oct W	Periodic Properties	7.7 – 7.8		
	18-Oct F	Catch-Up & Review for Exam 2			
8	21-Oct M	EXAM #2: 11:00 to 11:50 a.m. (during lecture) →Covers Ch. 5–7; Rooms TBA		<i>no HW/Q</i>	Solution Calorimetry (wet lab)
	23-Oct W	Simple Bonding	8.1 – 8.4		
	25-Oct F	Simple Bonding	8.5 – 8.8		
9	28-Oct M	Molecular Shapes & Bonding Theories	9.1 – 9.3	HW6, Q6	Alum (wet lab)
	30-Oct W	Molecular Shapes & Bonding Theories	9.4 – 9.6		
	1-Nov F	Molecular Shapes & Bonding Theories	9.7 – 9.8		
10	4-Nov M	Molecular Orbital Theory	Handouts	HW7, Q7	Molecular Geometry (computer lab)
	6-Nov W	Gases	10.1 – 10.3		
	8-Nov F	Gases	10.4 – 10.6		
11	11-Nov M	Gases	10.7 – 10.8	HW8, Q8	Light, Color, and Solutions (wet lab)
	13-Nov W	Gases & Problem Solving	10.9		
	15-Nov F	Catch-Up & Review for Exam 3			
12	18-Nov M	EXAM #3: 11:00 to 11:50 a.m. (during lecture) →Covers Ch. 8, 9, most of 10; Rooms TBA		<i>no HW/Q</i>	Project Lab (wet lab)
	20-Nov W	Liquids & Intermolecular Forces	11.1 – 11.3		
	22-Nov F	Liquids & Intermolecular Forces	11.4 – 11.5		
13	25-Nov M	Liquids & Intermolecular Forces	11.6 – 11.7	HW9	<i>no lab</i>
	27-Nov W	Catch-up & Problem Solving			
	29-Nov F	Thanksgiving Break - no classes			
14	2-Dec M	Solids	12.1 – 12.2	HW10, Q9	<i>no lab</i>
	4-Dec W	Solids	12.3 – 12.5		
	6-Dec F	Catch-up & Problem Solving			
15	9-Dec M	Solids	12.6 – 12.7	HW11, Q10	Window on the Solid State (computer lab)
	11-Dec W	Solids	12.8 – 12.9		
	13-Dec F	Catch-Up & Review for Final Exam			
Finals	20-Dec F	Final Exam: 10:05 a.m. to 12:05 p.m. →Covers Ch. 1–9 (~70%) and 10-12 (~30%); Rooms TBA			