

CHEMISTRY 104 Lecture 006 [MWF 12:05 Chemistry 1361]
Spring 2015

Department of Chemistry
University of Wisconsin, Madison

Instructor: Assistant Professor Timothy H. Bertram

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Location of Instructor Office Hours: Chemistry 4325

Instructor Office Hours: MW 1-2:30PM (or by appointment)

Course Website on Learn@UW: <https://learnuw.wisc.edu/>

General Chemistry Homepage: <http://genchem.chem.wisc.edu/>

Undergraduate Chemistry Office: Room 1328 Chemistry 263-2424

TA's Office Hours: Please check online at Learn@UW

How to contact us:

Questions can be asked in person during discussion section and office hours. Direct email of questions to the teaching assistants or me will be answered in ca. 24hrs. The subject line of the email **MUST** be [CHEM104-6]: subject.

Course Objectives:

Chemistry 104 is the second semester course in a two-semester General Chemistry sequence. Chemistry 103 and 104 provide a general background concerning the principles and factual basis of chemistry. The 103-104 sequence serves as a prerequisite for advanced courses such as Organic Chemistry (341 or 343), Analytical Chemistry (327 or 329), and Inorganic Chemistry (311). The prerequisite for Chemistry 104 is Chemistry 103. If it has been more than a semester since you took Chemistry 103, you may need to put in extra effort at the beginning of the semester to gain the necessary background.

Required Materials:

1. *Chemistry: The Central Science* (12th Ed.), Brown, LeMay, Bursten, Murphy and Woodward. **This is a custom edition for UW, available at the University Bookstore.** Used copies are available, and we have obtained a significantly discount price for this special edition. You may purchase the hardcover edition, a slightly less expensive unbound edition, or an electronic-only text (available with a MasteringChemistry account—see item 6 in this list). You may already have a copy from 103.
2. *Chemistry 104 Laboratory Manual*, Spring 2015 and carbonless laboratory notebook. The manual and notebook can be purchased (cash only) outside the classroom during the first two week of classes and later from the first floor laboratory stockroom (room 1334).
3. Safety goggles. Industrial quality eye protection is **required** in all chemistry laboratories. Safety goggles that fit over regular glasses can be purchased from University bookstores or along with the lab manual and notebook.
4. An electronic RF “clicker”. The lectures will make regular use of student “voting” on concept tests, surveys, and other questions. You will need to buy a radio-frequency clicker, specifically an I-clicker (not I-clicker2 or web-clicker) and bring it to every lecture. These can be purchased at the University Bookstore. **Register your clicker from the course Learn@UW page link if you did not do so last semester.**
5. An inexpensive calculator capable of calculating square roots, logarithms and exponential operations. The calculator will be used on exams, homework assignments, and in the lab. A programmable calculator may be used 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 exams (no cell phone or iPod calculators). You must clear the memory before entering the exam room. We reserve the right to check all calculators during exams.

6. A MasteringChemistry account for access to on-line 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>. If you took 103 within the last two years, your MasteringChemistry code should still allow you access this semester. The course ID is "CHEM104BERTRAM15".
7. USB Drive: A USB flash drive that will hold at least 2 GB is required for laboratory data collection.

COURSE INFORMATION

Lectures. During lectures I will introduce principles and illustrate concepts with examples and demonstrations. In addition to your notes, a set of lecture notes taken in class by a TA will be available at our Learn@UW web site listed above about two days after the lecture. Each lecture will also contain "clicker" questions. Your participation in these questions will count toward your final grade. In order to earn full points for clicker participation, you must answer at least 80% of in-class clicker questions. Point accumulation will start on Monday of week 3.

Cell phones should be turned off or silenced. Laptops and tablets are not prohibited in class as they can be very effective note taking tools. Please be aware that using the computer or other devices during class for activities not related to the class is very distracting, not only for you but for those who are sitting nearby. You will be asked to put away your device if it is being used for activities not related to the lecture.

Discussion Section. Twice a week, you will meet with a TA and your classmates for discussion. In these meetings, you will discuss assigned homework problems, work with groups of students to learn new material or reinforce/review existing ideas, learn about upcoming laboratory assignments, and have a forum for answering questions. *Please* prepare for discussion by bringing specific questions to class – this is a great opportunity to learn from your TA and fellow classmates.

Problem Sets. Problem solving is a crucial aspect of this course and problems will be assigned on a regular basis. These will be completed online via the MasteringChemistry homework system. In addition, each problem set will have a few extra credit problems worth a couple points each. The maximum score for a homework set is still 100 points, but these extra credit problems can offset small errors and difficulties associated with the MasteringChemistry system user learning curve. The system gives hints and allows multiple attempts, each with feedback. A small deduction (detailed for each problem set in the assignment and problem descriptions) is taken for each successive attempt. You can log on multiple times to complete the assignment. See Learn@UW for more information on the MasteringChemistry online homework system. Assignments will typically be posted on Monday morning and due by 11:55PM the following Sunday night. It is your responsibility to check Learn@UW to be aware of assignment due dates as they will not always be due on Sunday night.

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 later revealed to be correct, please send an e-mail to chem104hw@chem.wisc.edu with your name, course number (104), lecture section (6), and a brief description of your difficulty. The group of people who assist you will not answer content related inquiries.

Quizzes. Approximately 8 fifteen-minute quizzes will be given during discussion sections to help you evaluate your progress. These quizzes count toward your final grade. Your TA will go over the quiz immediately afterwards, and **you** will grade your own quiz; however **full credit** will be awarded regardless of your score as long as you take the quiz and turn it in. Nonetheless, you should use your score as an indication of your progress in the course. Missed quizzes **cannot** be made up, but two quizzes will be dropped in calculating the final grade. If you miss a quiz for any reason, including illness, it counts as a dropped quiz.

Lecture Demonstrations. We will use demonstrations during lecture to illustrate important ideas and facts. Be sure to make careful observations of what happens. Questions about observations or principles that have been presented via demonstrations may appear on exams.

LABORATORY

The laboratory experiments are a vital part of this course; you will develop skills that are not easily learned or demonstrated in lectures. These skills include:

- Designing experiments and interpreting data
- Using laboratory equipment properly
- Working with your fellow students in the laboratory
- Communicating your ideas about the data through discussions and writing

Lab Preparation. You **must** prepare in advance for each laboratory exercise by writing an introduction and procedural outline in your lab notebook. 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 the period in the form of the duplicate pages from your lab notebook. You will be graded on your pre-lab preparation, in-lab experimental technique and data analysis, and on your note taking skills. Your laboratory report is almost always due one business day after lab. Lab report due dates will be discussed by the TA in lab. Please note that late laboratory reports are not graded. In addition, two of the lab reports (noted with ** on the course calendar) are formal lab reports. These are due two business days after lab.

Please note that sandals are not acceptable footwear in the laboratory. Contact lenses should **not** be worn in the laboratory because fumes or splashes may be caught between them and your eye. Further attire requirements are described in your laboratory manual and by your TA.

Attendance. You must attend all laboratory sessions. There is no opportunity to make up a laboratory that you miss; a grade of zero will be recorded for unexcused absences. If you have an excuse for missing lab, notify your TA as soon as possible, at least 48 hours before the start of the lab period. Students entering lab later than 20min after the start of the lab will not be permitted to start the lab and will receive a grade of zero.

EXAMS and GRADING

Exams: There will be three in-class exams of 50 minutes each and one two-hour final exam. **No makeup exams will be given.** Exams *may* include questions based on the laboratory material. The final exam will cover material from the entire semester. **Please be alert to these exam dates.** You must report any religious conflicts with exams or laboratory exercises to your teaching assistant by the end of week two.

	Date and Time	Topics Covered
In Class Exam #1	W 02/11 12:05	Chapter 24
In Class Exam #2	M 03/16 12:05	Chapters 14-15
In Class Exam #3	M 04/13 12:05	Chapters 16-17
Final Exam	F 05/15 10:05	Chapters 14-17, 19-21 , 24

Grades. Your final grade will be computed with the following scheme:

	Percent	Notes
In Class Exams (3x, 12% each)	36%	No make-up exams
Laboratory	20%	
Online Homework	15%	See HW grading section
Quizzes	4%	See quizzes grading section
Clicker Participation	3%	
Final Exam	22%	No make-up exams

Your scores are available to you at Learn@UW, with a 3-5 day time delay. There are no opportunities for extra credit beyond the couple points on assignments.

ADDITIONAL RESOURCES

Numerous resources are available to assist you with either this course in particular or 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/>): 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.

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 other lecturers are available 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; 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 although you may collaborate with other students on assignments, the work you submit must be your own.

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. Accommodations still must be made well in advance, so please pursue these avenues immediately.

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/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.

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 policies on handling misconduct can be found in your chemistry lab manual and at the following website: <http://www.wisc.edu/students/saja/misconduct/UWS14.html>

Course Outline and Calendar

Week	Date	Topic	Chapter(s)	Lab
1	M 1/19	No Class	-	No Lab
	W 1/21	Class Introduction	-	
	F 1/23	Bonding Review	9.2-9.6	
2	M 1/26	Intro to Organic Chemistry	24	Molecular Structures
	W 1/28	Organic Chemistry	24	
	F 1/30	Organic Chemistry	24	
3	M 2/02	Organic Chemistry	24	Biodiesel
	W 2/04	Organic Chemistry	24	
	F 2/06	Organic Chemistry	24	
4	M 2/09	Organic Review	24	No Lab
	W 2/11	Exam 1	24	
	F 2/13	Applications in Organic	-	
5	M 2/16	Reaction Kinetics	14	Preparation of Aspirin and Some Flavoring Esters** (Redox Preparations)
	W 2/18	Reaction Kinetics	14	
	F 2/20	Reaction Kinetics	14	
6	M 2/23	Reaction Kinetics	14	Redox
	W 2/25	Reaction Kinetics	14	
	F 2/27	Applications in Kinetics	14	
7	M 3/02	Chemical Equilibria	15	Crystal Violet
	W 3/04	Chemical Equilibria	15	
	F 3/06	Chemical Equilibria	15	
8	M 3/09	Chemical Equilibria	15	Chemical Equilibrium and Le Chatelier's Principle
	W 3/11	Chemical Equilibria	15	
	F 3/13	Review Kinetics and Equilibria	14-15	
9	M 3/16	Exam 2	14-15	No Lab
	W 3/18	Acids and Bases	16	
	F 3/20	Acids and Bases	16	
10	M 3/23	Acids and Bases	16	Copper Ammine Compounds
	W 3/25	Acids and Bases	16	
	F 3/27	Applications in Acids/Bases	-	
11	3/30 – 4/03	Spring Break		No Lab

Week	Date	Topic	Chapter(s)	Lab
12	M 4/06	Additional Equilibrium	17	Acid and Base Solutions
	W 4/08	Additional Equilibrium	17	
	F 4/10	Review Acids/Bases	16-17	
13	M 4/13	Exam 3	16-17	No Lab
	W 4/15	Thermodynamics	19	
	F 4/17	Thermodynamics	19	
14	M 4/20	Thermodynamics	19	Chemical Equilibrium and Thermodynamics
	W 4/22	Thermodynamics	19	
	F 4/24	Electrochemistry	20	
15	M 4/27	Electrochemistry	20	Electrochemical Cells**
	W 4/29	Electrochemistry	20	
	F 5/01	Nuclear Chemistry	21	
16	M 5/04	Nuclear Chemistry	21	Neutron Activation of Silver, Lab check out
	W 5/06	Nuclear Chemistry	21	
	F 5/08	Final Exam Review	-	
17	F 5/15	Final Exam (10:05AM)	-	No Lab, Room TBD

**** Formal Lab Report.**

NOTE: Friday 1/30 is the last day to request an excused absence (e.g., religious holiday) for missing an exam or laboratory. We will work with you to reschedule these events in advance.

Discussion Section, Lab Sections, and Teaching Assistants (TA):

25803:	D501 L801	(MW 3:30 - 4:20PM W 7:45 - 10:45AM)	B387 Chemistry) 1329 Chemistry)	Glen Thurston	[gthurston@chem.wisc.edu]
25804:	D502 L802	(MW 4:35 - 5:25PM F 7:45 - 10:45AM)	B387 Chemistry) 1329 Chemistry)	Glen Thurston	
25805:	D503 L803	(TR 8:50 - 9:40AM W 7:45 - 10:45AM)	B355 Chemistry) 1329 Chemistry)	Brandon Taitt	[btaitt@chem.wisc.edu]
25806:	D504 L804	(TR 9:55 - 10:45AM F 7:45 - 10:45AM)	B355 Chemistry) 1329 Chemistry)	Brandon Taitt	
25807:	D505 L805	(TR 8:50 - 9:40AM M 2:25 - 5:25PM)	2377 Chemistry) 1329 Chemistry)	Jiewei Hong	[jhong@chem.wisc.edu]
25808:	D506 L806	(TR 9:55 - 10:45AM W 2:25 - 5:25PM)	2377 Chemistry) 1329 Chemistry)	Jiewei Hong	
25809:	D507 L807	(TR 11:00 - 11:50AM M 2:25 - 5:25PM)	B387 Chemistry) 1329 Chemistry)	Carlos Baez-Cotto	[cbaezcotto@chem.wisc.edu]
25810:	D508 L808	(TR 12:05 - 12:55PM W 2:25 - 5:25PM)	B387 Chemistry) 1329 Chemistry)	Carlos Baez-Cotto	
25811:	D509 L809	(MW 1:20 - 2:10PM T 5:40 - 8:40PM)	2377 Chemistry) 1329 Chemistry)	Lianna Dang	[dang4@wisc.edu]
25812:	D510 L810	(MW 2:25 - 3:15PM R 5:40 - 8:40PM)	2377 Chemistry) 1329 Chemistry)	Lianna Dang	
25813:	D511 L811	(MW 1:20 - 2:10PM T 5:40 - 8:40PM)	2385 Chemistry) 1329 Chemistry)	Alexander Foote	[afoote@chem.wisc.edu]
33065:	D512 L812	(MW 2:25 - 3:15PM R 5:40 - 8:40PM)	2373 Chemistry) 1329 Chemistry)	Alexander Foote	