

# General Chemistry 1050 MWEB

- Instructor: Prof. Mark Kobrak  
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Voice: (718) 915-5758  
Office: 3313N
- Office hours: Mon & Wed 9:30 – 11:00, or by appointment
- Required Text: *Chemistry, The Central Science*, Brown, LeMay and Bursten, Prentice Hall Pub., 2011, 12th Edition.
- Required Items: Scientific calculator without graphing or equation memory. Phones, iPods and similar devices are not acceptable.
- Recommended Items: Solutions to Exercises in Brown, LeMay and Bursten, R. Wilson, 12th Ed., Prentice Hall.

## Homework:

Homework is assigned but not collected. You are expected to complete and understand the homework assignments. If you do not, seek help! You are an adult and this is your responsibility.

## Online Supplements and Info:

<http://userhome.brooklyn.cuny.edu/mkobrak/> -go to *Teaching materials*

See also the course Blackboard site, accessible through the CUNY portal: <http://portal.cuny.edu>

## Counseling

- *Undergraduate Chemistry Advisor:* Prof. Gibney, bgibney@brooklyn.cuny.edu
- *Health Professions Counseling:* Prof. Silbering, silbering@brooklyn.cuny.edu

## Lecture Tests:

- FIRST TEST: **Weds, March 4th**
- SECOND TEST: **Wed, April 9th**

**NOTE:** **NO** Makeup exams are given for Lecture Tests.

**Quizzes:** Quizzes will be held in class roughly once every two weeks. The first quiz will be on Mon, Feb 3rd (3<sup>rd</sup> class). Your lowest quiz grade will be dropped before the average is calculated, but make-ups are not given (a missed quiz becomes the dropped grade). *I reserve the right to hold pop quizzes at any time.* You have been warned.

**Final Exam:** The final exam will take place on **Weds, May 21, from 10:30-12:30 PM.**

**Drop Dates:** **Feb 18** is the last day to drop a course without a grade. **Apr 24** is the last day to apply for non penalty withdrawal (*i.e.*, W grade).

## Other Dates:

As per the CUNY calendar, this class will not meet on these dates: 2/12, 2/17, 4/14-4/22

CONVERSION DAY: Class will meet Thurs, 2/20.

## Grading:

Your final grade will be determined as follows:

- 30% Quizzes (Your lowest quiz grade will be dropped, the rest will be averaged)
- 40% Two lecture tests (20% each)
- 30% Final Examination

### **Academic dishonesty is prohibited in the City University of New York.**

Cheating, plagiarism, internet plagiarism and obtaining unfair advantages are violations of policies of academic integrity and are punishable by penalties, failing grades, suspension and expulsion.

For more information about CUNY policy on academic integrity see

**[http://www.cuny.edu/about/administration/offices/la/Academic\\_Integrity\\_Policy.pdf](http://www.cuny.edu/about/administration/offices/la/Academic_Integrity_Policy.pdf)**

Cheating on any assignment will result in a grade of F for the course.

I will be Xeroxing quizzes and exams before I return them to prevent post-exam modification.

### **Homework Assignments**

Many Students who "did well" in high school chemistry do not get good grades in college chemistry. The reason: they fail to develop the learning skills and problem-solving skills necessary for the advanced level of chemistry at Brooklyn College. The big difference between high school and college is the large amount of work you must do on your own and the emphasis we place on THINKING (instead of memorizing). Your key to success? Learning how to study properly and doing LOTS of homework! Falling behind in reading and homework is a SERIOUS MISTAKE. Organize your life around your coursework and keep up with the assignments.

Do not read Brown, LeMay and Bursten like a novel or a magazine, lying on the couch. Sit at a desk with a pencil, paper and your calculator handy. When you get to the end of a section, work through the examples. If you have trouble with them, look for more problems like them at the end of the chapter. Keep track of whether you get the right answer or not, so that you know how you are doing on a particular type of problem. And if you dislike doing a particular type of problem, that is probably a sign that you are not as skilled with it as you need to be. The more you hate a particular type of problem, the more time you should spend on it.

The assigned homework problems are a guide to the kind of problems you are expected to be able to do, but if you do not understand a topic after doing the problems you need to find more. Your text may have other, similar problems that are not assigned, or you can find another book or check the internet for similar problems. The library has a large number of first-year chemistry textbooks; pull one off the shelf, find a section that covers the topic you are interested in, and look for more examples. You may even find that the other book's example clarifies things for you.

### **Study Groups**

FIND A STUDY GROUP!!! Almost any professional scientist or practicing doctor will tell you that they learned science by studying with a group. Everyone, both the stronger and weaker students, benefit when they work together. This is the one thing researchers in science education agree on. Form a group. If necessary, stand up after class and shout to your classmates that you are looking for study partners. This is better than having to repeat the course.

Students sometimes tell me that they prefer to work alone. In most cases, this is self-destructive. It takes effort to organize a group, stick to a schedule, and participate in dialogue about a difficult subject. But if you can't convince yourself to make the effort, stop studying science now. Science and medicine in the 21<sup>st</sup> century are collaborative, and if you are successful you will be working in groups for the rest of your life. Start now, and it will make your undergraduate educational experience easier and more rewarding.

## Chemistry 1050 Lecture Schedule

This is an approximate schedule; it may be modified if the instructor deems it useful to do so. Unless specific sections are indicated, you are responsible for the whole chapter. For best results, read the assigned material before lecture. These homework problems are not collected, but you are responsible for them.

| Lecture | Topics  | Assigned Reading   | Assigned Homework   |
|---------|---|--|---|
| 1-4     | Math Review,<br>Dimensional Analysis,<br>Basic Concepts | Appendix A.1 (pp. 1051-1053)<br>Chapter 1 (Table 1.5 from nano- to Giga-)  | 1.1, 1.5, 1.7, 1.11, 1.13, 1.15, 1.17, 1.19, 1.23, 1.27, 1.31, 1.33, 1.35, 1.37, 1.39, 1.41, 1.45, 1.47, 1.49, 1.51, 1.55, 1.59, 1.65   |
| 5-7     | Elements, Compounds, Ions, Periodic Table, Nomenclature | Chapter 2 (memorize Tables 2.4 and 2.5)<br><br>Must be able to convert between the element name and symbol for all elements 1-36, and all Group I, II and III-VIII elements. You do not have to memorize atomic numbers. | 2.1, 2.4, 2.6, 2.9, 2.13, 2.15, 2.17, 2.19, 2.21, 2.23, 2.25, 2.27, 2.29, 2.37, 2.39, 2.41, 2.43, 2.45, 2.47, 2.49, 2.51, 2.53, 2.57, 2.59, 2.61, 2.63, 2.65, 2.67, 2.69, 2.71, 2.82, 2.104 |
| 8-10    | Chemical Equations, Formula Masses, Moles               | Chapter 3.1-3.4  | 3.1, 3.5, 3.11, 3.13, 3.15, 3.17, 3.19, 3.21, 3.25, 3.27, 3.35, 3.39,   |
| 11      | Midterm #1  |  |   |
| 12-16   | Empirical Formulas, Stoichiometry, Limiting Reagents    | Chapter 3.5-3.7  | 3.43, 3.45, 3.47, 3.49, 3.53, 3.61, 3.63, 3.67, 3.69, 3.75, 3.77, 3.79, 3.89, 3.93, 3.97, 3.105, 3.109  |
| 17-20   | Chemical Reactions, Molarity,                           | Chapter 4.1-4.4<br>( <u>Omit</u> Oxidation Numbers, pp. 132-133)   | 4.1, 4.5, 4.7, 4.15, 4.17, 4.19, 4.21, 4.23, 4.29, 4.31, 4.35, 4.37, 4.39, 4.47, 4.51, 4.53, 4.57   |
| 21      | Midterm #2  |  |   |
| 22-24   | Solution Stoichiometry                                  | Chapter 4.5-4.6  | 4.61, 4.63, 4.65, 4.67, 4.73, 4.79, 4.81, 4.83, 4.87  |
| 25-27   | Thermochemistry   | Chapter 5  | 5.1, 5.5, 5.8, 5.13, 5.19, 5.25, 5.27, 5.31, 5.35, 5.41, 5.45, 5.47, 5.51, 5.53, 5.55, 5.57, 5.63, 5.65, 5.69, 5.73, 5.79, 5.102  |
| 28      | Final Exam Review                                       |  |   |

## Chemistry Careers In and Out of the Laboratory

A degree in chemistry opens doors to dozens of exciting and rewarding careers. Here are just a few possibilities.

- Get involved in product development, manufacturing, or quality control for companies producing anything from chemicals to pharmaceuticals to textiles.
- Go on to obtain a MS or PhD in chemistry, biochemistry, biotechnology, bioinformatics, pharmacology, or any other biomedical field, and take a leading role in medical research. Design and test new drugs and medical devices.
- Get involved in sales and marketing for chemical and pharmaceutical firms. Companies are always looking for people with a strong technical background to market their products, and will pay top dollar for them.
- Go into the field as an environmental chemist to study and protect the natural world.
- Use your skills in interesting and challenging ways, from evaluating risk for insurance firms to restoring artwork for museums.
- Work in law enforcement, in anything from forensic investigation to health and safety regulation. Or work inside the political process at a government agency to help formulate policy on scientific, medical and environmental issues.
- Pursue a career in patent law and help bring the next great scientific breakthrough to the market. Or work in the U.S. Patent and Trademark Office to insure that inventors' rights are protected.

### Salary Information

| Chemistry Degree | Median Starting Salary* | Median Base Salary (all chemists)** |
|------------------|-------------------------|-------------------------------------|
| BA or BS         | \$38,000                | \$69,800                            |
| MS               | \$60,000                | \$80,000                            |
| PhD              | \$76,300                | \$98,000                            |

\*From D. J. Hanson, *Chemical and Engineering News*, March 14, p.49, 2011.

\*\*From D. J. Hanson, *Chemical and Engineering News*, December 12, p. 37, 2011.

Chemists do sometimes have to change jobs or make career choices, but their skills are always in demand. In 2009, the U.S. unemployment rate peaked at 10.1%; the rate for chemists and chemical engineers that year was 3.9%. (see S. L. Rovner, *Chemical and Engineering News*, Nov. 7, p. 34, 2011). A skilled chemist is a valuable commodity.

Salaries for chemists are high, but do not do justice to the excitement of the field. Science as it is practiced today is collaborative, and chemists have abundant opportunities to travel, to work with interesting people, and to present the results of their work in ways that have a profound influence on the world. Science will shape the world of the 21<sup>st</sup> century, and you have the chance to be part of that process.

For more information, see the department secretary to check out the "Careers in Chemistry" folder in the Chemistry Department office (359NE). Or contact the departmental advisor: Prof. Brian Gibney, (718) 951-5458; bgibney@brooklyn.cuny.edu

## Medical School, The Chemistry Major, and You

**Fiction #1:** Being a chemistry major will hurt my chances for medical school, because the hard courses may lead to a lower GPA.

**Fact:** Students majoring in mathematics and the physical sciences (this includes Chemistry) have the highest medical school acceptance rate of any major:

| Primary Undergraduate Major                             | Acceptance Rate |
|---|-----------------|
| Mathematics and Physical Sciences (including Chemistry) | 49%             |
| Biology and Health Sciences                             | 42%             |
| Humanities and Social Sciences                          | 46%             |
| Other   | 43%             |

Based on data for the entering class of 2011, reported by the American Association of Medical Colleges

Table compiled from data available at <https://www.aamc.org/data/facts/applicantmatriculant/>

**Fiction #2:** Chemists have to take a lot of hard courses so they don't have time to do volunteer work, research, and other activities that help with medical school applications.

**Fact:** A student who has completed his or her requirements for medical school can obtain a chemistry degree with as few as four additional courses. This leaves plenty of time for other activities.

**Fiction #3:** If I don't get into medical school, I may be stuck working in a lab all day.

**Fact:** Chemists have enormous opportunities outside the lab. Chemical and pharmaceutical companies desperately need managers and salespeople with chemical knowledge, and will pay top dollar for them. Chemists also find work in finance, insurance, law, government and manufacturing. Take a look at the other side of this page, or come to the Chemistry Office and ask to see the "Careers in Chemistry" folder.

### **Some other advantages of being a chemistry major:**

- Chemistry majors can receive credit for performing research work with a faculty mentor. This means the time you spend on research gets you closer to graduating and your research experience appears on your transcript.
- Chemistry majors get the skills they need to perform advanced laboratory work, so they can get better research positions, accomplish more and get stronger letters of recommendation from their mentors.
- Thanks to generous donations by alumni, the Department of Chemistry is able to give out more than \$20,000 every year in fellowships, scholarships and awards. These are an aid to both the pocketbook and the resumé.
- Brooklyn College's first Rhodes Scholar of the 21<sup>st</sup> Century is a Chemistry major.

For more information, contact the departmental advisor: Prof. Brian Gibney, (718) 951-5458; [bgibney@brooklyn.cuny.edu](mailto:bgibney@brooklyn.cuny.edu)