

GENERAL CHEMISTRY I, CHEM 1100 – FALL 2014

IMPORTANT: If your science background is poor, consider taking CHEM 1050 instead of Chemistry 1100. See the last page for the Choosing a First Course in Chemistry sheet.

Required Texts:

- *Chemistry, The Central Science*, Brown, LeMay, Bursten, Murphy, Woodward, Stoltzfus, publisher--Pearson., 2014, **13th Edition** (The Mastering Chemistry Student Access Code is **NOT** required). Note: It is a bad idea to rent this book since it will also be used in Chem 2100.
- *Experiments in General Chemistry*, M. N. Kobra, Ed., **THIRD** edition, Kendall/Hunt, Dubuque, IA, 2012 (Only available at the Brooklyn College bookstore.)

Required Items:

- Scientific calculator, **Graphing calculators are not allowed on exams!**
- Lock for lab drawer.--bring to first lab.
- Matches; dish detergent, roll of paper towels. (You will be given safety glasses in your lab kit.)

Recommended Items: • Lab coat or apron

Online Supplements and Info:

www.brooklyn.cuny.edu/web/aca_naturalsciences_chemistry/Courses_Chem1100-Fa14-Syllabus.pdf
(online **syllabus**)

<http://academic.brooklyn.cuny.edu/chem/howell/practice.htm> (old BC chemistry **exams**)

<http://www.brooklyn.cuny.edu/web/academics/schools/naturalsciences/undergraduate/chemistry.php>
(Chemistry Department Homepage)

<http://www.brooklyn.cuny.edu/web/academics/honors/prehealth.php> (Pre-Health Professions website)-
-contains a link to the **Pre-Health Professions Handbook** (scroll down to see the link).

Counseling *Coordinator for General Chemistry*

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LECTURE TESTS FOR DAY LECTURE: Note that these are during common hours and that the first exam is quite soon. (These are not for the evening lecture).

FIRST TEST: **Thursday Oct. 2, 12:30 – 2:00 PM,** Covers Recitation assignments 1–4

SECOND TEST: **Thursday, Nov. 13, 12:30 – 2:00 PM,** Covers Recitation assignments 5–9

NO Makeup exams are given for Lecture Tests. We mean it. For recitation assignments, see pages 4-5.
Graphing calculators and cell phones are not allowed on exams.

FINAL EXAM: **FRIDAY DEC. 19, 8:00 AM – 10:00 (or 10:15) AM**

NOTE: On Tuesday Sept. 23, FRIDAY classes meet.

Brooklyn College
General Chemistry I (CHEM 1100) Syllabus

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://web.cuny.edu/academics/info-central/policies/academic-integrity.pdf>

Student Disability Services

In order to receive disability-related academic accommodations students must first be registered with the Center for Student Disability Services. Students who have a documented disability or suspect they may have a disability are invited to set up an appointment with the Director of the Center for Student Disability Services, Ms. Valerie Stewart-Lovell at 718-951-5538. If you have already registered with the Center for Student Disability Services please provide your professor with the course accommodation form and discuss your specific accommodation with him/her.

Lab Exemptions: Students who are repeating the course may be able to obtain laboratory exemptions. You may file a laboratory exemption request form in the Chemistry Department office (359 NE).

Students who receive exemptions **must take the recitation quizzes** and have the option of taking the lab quizzes. If you re-take the lab quizzes, we will use whichever lab quiz grade is higher, the previous one or the new one. Lab exemptions are not available after Sept. 10. If you are lab exempt, **notify your recitation instructor** early in the semester that you are attending recitation so that you don't get dropped from the course.

Drop Dates: Wed Sep 3 is the last day to ADD a course.

Wednesday Sept. 17 is the last day to DROP a course without a grade.

Thursday, November 6 is the last day to apply for non penalty withdrawal (*i.e.*, W grade). See your lecture instructor or the course coordinator for advice. **To withdraw, you MUST file a form in the Registrar's Office (either electronically or in person) and go to the stockroom to CHECK OUT from the laboratory.**

Note that first- and second-semester freshmen (and SEEK, ESL, and Honors students) MUST get an adviser's permission in order to withdraw; advisers are available in the Center for Advisement and Student Success in Boylan. For information about withdrawal and financial aid, see <http://www.brooklyn.cuny.edu/web/about/administration/enrollment/faq/withdrawing.php>

Note: You may transfer to CHEM 1050, a slower paced course, if Chem 1100 is too hard for you. The last day to switch to CHEM 1050 is **Wed. Sept 3** and may be done only if seats are available in 1050. Send an email to Professor Levine (page 1) for a Chem 1050 overtally.

GRADING:

Your final grade will be determined as follows:

- 30% Two lecture tests
- 20% Minimum of five recitation quizzes*
- 18% Laboratory reports and performance
- 7% Two laboratory quizzes
- 25% Final Exam

**The lecturer may adjust recitation quiz grades in sections where the recitation quiz average is substantially too high or too low in relation to the lecture exam averages.*

CHEM 1100 Lecture Schedule

Brooklyn College
General Chemistry I (CHEM 1100) Syllabus

Unless specific sections are indicated, you are responsible for the whole chapter.

For best results, read the assigned material before lecture.

| Lecture # | Topics | Assigned Reading |
|-----------|----------------------------------------------------------------------------------------------|--------------------------------------------------|
| 1, 2 | Math Review, Dimensional Analysis, Basic Concepts | Appendix A.1 Chapter 1 (memorize Table 1.2) |
| 3, 4 | Elements, Compounds, Ions, Periodic Table | Chapter 2 (memorize Tables 2.4 and 2.5) |
| 5, 6 | Chemical Equations, Moles, Empirical Formulas | Chapter 3.1–3.5 |
| 7, 8 | Stoichiometry, Limiting Reagents | Chapter 3.6–3.7 |
| 9, 10 | Chemical Reactions, Molarity, Solution Stoichiometry (<u>Omit</u> Oxidation Numbers, p 132) | Chapter 4 |
| 11–13 | Thermochemistry | Chapter 5 |
| 14, 15 | Gases | Chapter 10 |
| 16–18 | Atomic Structure, Periodic Properties | Chapter 6, Chapter 7.1–7.6 |
| 19, 20 | Ionic and Covalent Bonding, Polarity | Chapter 8 |
| 21, 22 | Molecular Shape, Dipoles | Chapter 9.1–9.3 |
| 23, 24 | Intermolecular Forces, Phase Changes | Chapter 11.1, 11.2, 11.4, 11.5 |
| 25, 26 | Concentration, Solubility, Colligative Properties | Chapter 13.1–13.5 |
| 27, 28 | Phase Diagrams, Solids | Chapter 11.6, 12.1 |

Magner Career Center (1303 James Hall 718-951-5696)

It's never too early to start preparing for your career. Do you need help preparing a resume, finding a job or internship, connecting your college experience with a career or developing professional skills? Visit the Magner Career Center at: 1303 James Hall, call 718-951-5696 or sign up for workshops and jobs and internship notifications on the WebCentral Portal (<http://portal.brooklyn.cuny.edu>).

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

Brooklyn College
General Chemistry I (CHEM 1100) Syllabus

homework! Falling behind in reading and homework is a **SERIOUS MISTAKE**. Organize your life around your coursework and keep up with the assignments.

As you read the textbook, do the exercises and example problems in the chapter. In other words, read and work your way through the chapter. After working through each chapter work out the assigned homework problems. Note well there will not be enough time in class for your instructor to go over every assigned problem. A good indicator of the kinds of problems found in tests is the homework problems. See your teacher during office hours for extra help.

Reading and Homework Assignments for Weekly 50-minute Recitation Meetings

| Meeting # | Assigned Material |
|--------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Meeting 1 Read: Homework: | Math Review, Dimensional Analysis, Basic Concepts page xxiv, Appendix A.1 pages 1092-1094, and Chapter 1 (Memorize Table 1.2). You do not have to learn the formulas for converting between Fahrenheit and Celsius. You do not have to memorize conversion factors for converting between English units and SI units. If you have difficulty with the math problems, consider transferring to Chemistry 1050. Practice Exercises a–d, p. 1094 Chapter 1, Problems 1, 7, 13, 15, 16, 17, 19, 21, 24, 27c, 28d, 29, 30a, 35, 37, 39, 41, 45, 47, 51a, b, d, f, 77 (Problems are at the end of each chapter. Answers to red problems are in the back of the textbook.) |
| Meeting 2 Read: Homework: | Elements, Compounds, Ions, Periodic Table Chapter 2 (Memorize Table 2.4 and 2.5) Chapter 2, Problems 11, 13, 18, 27, 29, 33, 39, 41, 45, 49, 51, 55, 57, 58, 61, 65, 67 (change e to hypochlorite), 71, 73, 75, 77, 81, 83, 109. Note: In naming cations of metals that form only one cation, do not include a Roman numeral. For example, the names sodium(I), magnesium(II), and aluminum(III) will be marked wrong on exams. |
| Meeting 3 Read: Homework: | Chemical Equations, Moles, Empirical Formulas Chapter 3.1–3.5 Chapter 3, Problems 1, 9, 11, 15, 19, 21, 23, 25a, b, 27, 30, 35, 37, 41, 45, 47, 51, 53, 55, 59. |
| Meeting 4 Read: Homework: | Stoichiometry, Chemical Reactions Chapter 3.6, 3.7, and Chapter 4.1–4.2 Chapter 3, Problems 7, 61, 62, 80, 83, 86, 107 Chapter 4, Problems 14, 17, 21, 23, 26, |
| Meeting 5 Read: Homework: | Acid-Base Reactions, Oxidation of Metals Chapter 4.3, 4.4 (Omit oxidation numbers, p. 132). Chapter 4, Problems 33, 34, 37, 39, 45a, 47, 51b, c, 53, 56 |
| Meeting 6 Read: Homework: | Molarity, Solution Stoichiometry Chapter 4.5, 4.6 Chapter 4, Problems 59, 60, 61, 62, 71, 72, 75, 76, 81, 83, 85 |
| Meeting 7 Read: Homework: | Thermochemistry Chapter 5 Chapter 5, Problems 13, 14, 15, 21, 23, 24, 25, 39, 43, 46, 47, 51, 53, 55, 57, 62, 65, 67, 69, 73, 76, 83a |

Brooklyn College
General Chemistry I (CHEM 1100) Syllabus

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| Meeting 8 Read: Homework: | Gases Chapter 10.1–10.8 Chapter 10, Problems 19, 26, 29, 34, 35, 39, 43, 47, 51, 52, 56, 57, 61, 63, 71, 73, 75, 82, 83, 90. |
| Meeting 9 Read: Homework: | Atomic Structure Chapter 6 Chapter 6, Problems 13, 14, 15, 17, 18, 19, 21, 23, 25, 29, 30, 31, 37, 39, 41, 55, 56, 57, 61, 62, 63a,b, 67, 71, 75, 77, 79, 81 |
| Meeting 10 Read: Homework: | Periodic Properties, Ionic Bonding Chapter 7.1–7.6, and Chapter 8.1–8.3 Chapter 7, Problems 13, 17, 21, 23, 25, 29, 31a, 34, 37, 39, 45, 59, 67. Chapter 8, Problems 9, 13, 15, 19, 22, 24, 26 |
| Meeting 11 Read: Homework: | Covalent Bonding, Bond Energy, Polarity Chapter 8.4–8.9 Chapter 8, Problems 31, 33, 35, 37, 40, 41, 47, 48a,b, 51, 53, 54, 55, 56, 63, 64, 69, 92 |
| Meeting 12 Read: Homework: | Molecular Shape, Dipoles Chapter 9.1–9.3 Chapter 9, Problems 17, 22, 23, 25a,b,c, 26, 27, 29, 37, 41, 44, 94. |
| Meeting 13 Read: Homework: | Intermolecular Forces, Phase Changes, Solubility, Concentrations Chapter 11.1, 11.2, 11.4, 11.5, and Chapter 13.1–13.4 Chapter 11, Problems 9, 10, 15, 17, 18, 21, 23, 25, 49, 51, 53, 55 Chapter 13, Problems 15, 16, 25, 33, 34, 37, 39, 41, 43, 45, 48, 49, 51 |
| Meeting 14 Read: Homework: | Colligative Properties, Phase Diagrams, Solids Sections: 13.5, 11.6, 12.1 Chapter 13, Problems 65, 71, 72, 74, 79, 80 Chapter 11, Problems 59, 61, 62 Chapter 12, Problems 9, 11, 13 |

Your instructor has the option of scheduling a two-hour recitation session for the 14th meeting.

CHEM 2100 (General Chemistry II) First Assignment (next semester)

It is necessary to do some preparatory work before your first meeting in Chemistry 2100.

Chapter 14 Sections 14.1–14.3 (omit Sec. 14.4)

Chapter 14, Problems 2, 17, 19, 21, 23a,b,c, 25, 27, 30, 31, 33, 34, 37

LABORATORY EXPERIMENTS

Before coming to laboratory, read the scheduled experiment and any other material assigned. Unless otherwise noted, page numbers refer to your laboratory manual. You must bring the lab manual to each lab class.

Brooklyn College recognizes the importance of reproductive hazard awareness and protection. During laboratory exercises students may be exposed to chemical reagents that may present specific risks to

Brooklyn College
General Chemistry I (CHEM 1100) Syllabus

reproductive health, especially students who are pregnant. Therefore, it is strongly recommended that you do not take the following course if you are pregnant. If you become pregnant during the semester, please consult with your laboratory instructor.

NOTE: **SAFETY GOGGLES MUST BE WORN IN THE LABORATORY!** The goggles must be indirectly-vented to offer splash protection. You will be provided goggles in your lab kit. **If your instructor observes you violating eye protection or other safety policies, you can be removed from the laboratory and/or given a 10% (or higher) penalty on your laboratory report grade.**

Scientific data requires special treatment. It must be recorded in non-erasable **ink** in your lab book immediately after a measurement is taken; partners cannot copy each others' data at a later time.

Altering or copying data outside of the laboratory represents academic dishonesty and will be prosecuted as such if observed. Further, you will receive no credit for any lab report that includes data that are not your own. If your data are messy, you may copy them over onto a final report, but you must include your original data when you turn in your report. You **MUST** get your instructor's initials on your data sheet before you leave the lab.

Lab reports are due one week after you finished the experiment. All lab reports not handed in will receive a grade of zero. Late lab reports are penalized as follows: 10% off for 1 week or less lateness; 25% off for 2 weeks late; 35% off for 3 weeks late; 45% off for 4 weeks late, etc.

If your lab instructor is **not** grading the lab reports and returning them to you, please **notify the lecturer.**

From meeting three (Expt. 2) on, you are required to hand in an outline described on the next page.

Students who miss a laboratory:

Multiple sections of Chemistry 1100 run, and students who miss a section of their assigned laboratory should make it up in another section as soon as possible. To do this, they must obtain a make-up card from the General Chemistry stockroom. (This card does NOT have to be signed by their regular laboratory instructor.) They then go to the lab period in which they wish to make up the experiment, identify themselves to the instructor in that section, and (if given permission) perform the work. After the experiment is complete, the instructor for that section must sign and date the make-up card. The signed make-up card must be given to the regular laboratory instructor as proof that the lab was made up.

Laboratory Breakage. In some schools, a laboratory fee is charged everyone. Our practice is to charge you only for the replacement cost of any items you lose or break. After check out, a bill will be prepared which you may pay at the bursar's office the following semester.

NOTE: If you have checked in for any lab course **you must check out** even if you only attend class for one or two weeks before dropping the course. Students who fail to check out will be charged a fee of **\$50** plus the cost missing or broken equipment. Students who drop a course must go to the stockroom to check out **as soon as possible.**

Errata for Kobrak, "Experiments in General Chemistry, 3rd. ed.," Spring 2013

Experiment 6, page 61:

In the last equation on the page, the "+" after the first " C_{Cu} " should be a multiplication sign ("x"). That is, C_{Cu} is multiplied by the value in the parentheses that follow it.

Experiment 12, page 126:

Six lines from the bottom of the page, in the last sentence of the second-to-last paragraph, the phrase "treated as being 2.0 molal" should read "treated as being 0.20 molal".

Brooklyn College
General Chemistry I (CHEM 1100) Syllabus

PREPARATION FOR LABORATORY

To help prepare you for lab, you are required to hand in before each lab (except the experiment in week 2) a sheet stating (a) what quantities are to be measured and (b) what quantities are to be calculated from the measurements. For an experiment where there are no measurements, just state briefly what you are to do and what you are to observe. What you hand in should be no more than 4 to 5 lines long and must **NOT** include the detailed procedure of the experiment. If you do not hand this in, your instructor will deduct 5% from your grade for that lab report.

| Meeting | Laboratory Assignment |
|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | <u>Introduction to Laboratory</u> <i>Check in, Screening quiz, Lab safety..</i> |
| 2 | <u>Experiment 1: Density and Measurement</u> <i>Return safety quiz and the signed safety sheet.</i> |
| 3 | <u>Experiment 2: Introduction to Gravimetric Analysis</u> <i>Gravimetric determination of water of crystallization.</i> |
| 4 | <u>Experiment 3: Synthesis of Zinc Iodide</u> |
| 5 | <u>Experiment 4: Basics of Chemical Reactions</u> |
| 6 | <u>Experiment 5: Volumetric Analysis: Acid-Base Titration</u> (This is a long experiment) |
| 7 | <u>Experiment 6: Introduction to Calorimetry.</u> (Note: If you are repeating the lab and have the second edition of the lab manual, you can get copies of experiments 7 and 8 from the stockroom.) |
| 8 | <u>Experiment 7: Evaluation of the Gas Law Constant</u> |
| 9 | <u>Experiment 8: Determining Atomic Emission by Spectroscopy</u> (Short experiment) |
| 10 | <u>Experiment 9: Synthesis of Aspirin</u> |
| 11 | <u>Experiment 10: Spectrophotometric Analysis of Aspirin</u> |
| 12 | <u>Experiment 11: Intermolecular Forces and Physical Properties</u> |
| 13 | <u>Experiment 12: Determination of Molecular Weights by the Method of Freezing-Point Depression</u> |
| 14 | Check out and Review <u>No experiments are permitted.</u> |

CHOOSING A FIRST COURSE IN CHEMISTRY

Some students enroll in a first course in chemistry that is not appropriate for them. The following information will help you make sure you are in the right course. If you decide you are in the wrong course, you should make any change as soon as possible. For further advice, consult your instructor, the Chemistry Department Deputy Chair in 359NE, or the Pre-Health Professions Advisor.

