GENERAL CHEMISTRY II, CHEM 2100 – SPRING 2014

If you took Chemistry 1050 and 2050, you should realize that these courses go at half the rate of Chemistry 2100, so ***in Chem 2100 you will have to work twice as hard as you did in Chem 1050 and 2050.***

Required Texts:
- *Chemistry, The Central Science*, Brown, LeMay, Bursten, Murphy, Woodward, Prentice Hall Pub., 2011, 12th Edition
- *Experiments in General Chemistry*, M. N. Kobrak, Ed., **Third** edition. Kendall/Hunt, Dubuque, IA, 2012

You MUST bring this lab manual to the FIRST lab meeting--it is needed for an experiment.

Required Items:
- Scientific calculator (**Graphing calculators are not allowed on exams)**
- Lock for lab drawer
- Safety goggles (**supplied in lab kit**); matches; dish detergent, paper towels

Recommended Items:
- Lab coat or apron.
- Study Guide to Brown, LeMay and Bursten, James C. Hill, 12th Ed., Prentice Hall
- Solutions to Exercises in Brown, LeMay and Bursten, R. Wilson, 12th Ed., Prentice Hall

Online Supplements and Info:

http://chemscript.brooklyn.cuny.edu/web/doc/2014_Spring_Syllabus_Chem2100.pdf (syllabus on line)
http://academic.brooklyn.cuny.edu/chem/howell/practice.htm (old BC chemistry exams)
http://chemscript.brooklyn.cuny.edu/web/index.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**.

Counseling

Coordinator for General Chemistry	Prof. Ira Levine, 3315N inlevine@ brooklyn.cuny.edu
Undergraduate Chemistry Advisor:	Prof. Brian Gibney, 540NE bgibney@brooklyn.cuny.edu
Health Profession Counseling:	Prof. Silbering 2231B silbering@brooklyn.cuny.edu

See also the Pre-Health Professions Handbook

LECTURE TESTS: **Note that these are during common hours**

FIRST TEST: **Thursday**, **March 13, 12:30 – 2:00 PM**, Covers Recitation assignments 1–5

SECOND TEST: **Thursday**, **April 24, 12:30 – 2:00 PM**, Covers Recitation assignments 6–10

NO Makeup exams are given for Lecture Tests. We mean it. Graphing calculators and cell phones are not allowed on exams. See pages 3-4 for recitation assignments.

FINAL EXAM: **FRI. MAY 23, 8:00 AM – 10:00 (or 10:15) AM**, rooms TBA

NOTE: On Thursday, Feb. 20, MONDAY classes meet.

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: If you are repeating the course you may be able to obtain a lab exemption by filing a lab exemption request form in the Chemistry Department office (359 NE). Students who receive lab exemptions **MUST attend recitation and take the recitation quizzes**. Whether a lab-exempt student re-takes the lab quizzes is up to the student. 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 Feb. 10

Drop Dates: Tuesday February 18 is the last day to drop a course without a grade.
Thursday, April 24 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.** Tuesday Feb. 4 is the last day to add a course.

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 and lab quiz grades in sections where the recitation or lab quiz average is substantially too high or too low in relation to the lecture exam averages.*

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

Experiment 13, page 143:

In the "Net Ionic Equations" text box, the second equation should have 2 nitrate ions on the right-hand side. That is, the second term on the right-hand side should read "2 NO_3^-" not "NO^-"

Experiment 14

Page 126: In Figure 14-3, the left-most product at the bottom of the figure should read "$Mg(NH_4)PO_4$", not "$Mg(PO_4)_2$" as currently written.

Chemistry 2100 Lecture Schedule

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	Chemical Kinetics	Chapter 14 Sections 14.1–14.3, 14.5–14.7 (omit Arrhenius Equation p. 578 bottom to p. 581 top.
3, 4	Chemical Equilibrium	Chapter 15
5, 6	Acids and Bases	Chapter 16 (omit Section 16.10). Appendix A.2-logarithms
7, 8	Aqueous Equilibria, Acid-Base	Chapter 17, Sections 17.1–17.3
9 – 11	Aqueous Equilibria, Precipitation	Chapter 17, Sections 17.4–17.7
12, 13	Entropy and Free Energy	Chapter 19
14	Oxidation-Reduction	Chapter 4, p.131–134 Chapter 20, Sections 20.1, 20.2
15, 16, 17	Electrochemistry Equivalents and Normality	Chapter 20, Sections 20.3–20.7, 20.9 See: page 54 of the lab manual.
18	Transition Metals	Section 23.1
19, 20	Coordination Compounds	Chapter 23
21, 22	Hybrid Orbitals, Periodic Trends	Chapter 9, Sections 9.4–9.6 Chapter 22, Section 22.1
23, 24	Organic Chemistry	Chapter 12, Section 12.8 Chapter 24, Sections 24.1–24.6
25	Biochemistry	Chapter 24, Sections 24.7–24.10
26, 27	Nuclear Chemistry	Chapter 21
28	REVIEW	

NOTE: YOUR EXPERIENCE IN CHEM 1100 SHOULD HAVE TAUGHT YOU THAT HARD WORK AND LOTS OF STUDY ARE NECESSARY FOR SUCCESS.
TO PASS CHEM 2100 WITH A GOOD GRADE, YOU MUST STUDY AT LEAST 10 HOURS EACH WEEK. PLAN YOUR SCHEDULE ACCORDINGLY!

Reading and Homework Assignments for Weekly 50-minute Recitation Meetings

Meeting #	Assigned Material
Meeting 1 Read: Homework:	**Chemical Kinetics** 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
Meeting 2 Read: Homework:	**Chemical Equilibrium** Chapter 14, Sections: 14.5–14.7 (omit Arrhenius Equation p. 578-580), and Chapter 15, Sections: 15.1–15.4 Chapter 14, Problems 53, 54, 57, 69, 70, 74, 77, 78. 81, 85, 87, 115 Chapter 15, Problems 8, 15, 17, 19, 23, 25, 31
Meeting 3 Read: Homework:	**Acids and Bases** Chapter 15, Sections: 15.5–15.7, and Chapter 16, Sections 16.1–16.4, Appendix A.2 Chapter 15, Problems 34 ,36, 37, 39, 43, 45, ,51, 52. 57, 61, 63, 82 Chapter 16, Problems 13, 14, 15, 17, ,19, 21 26, 27, ,28, 29, 30, 34, 38
Meeting 4 Read: Homework:	**Acid-Base Chemistry** Chapter 16, Sections 16.5–16.9, 16.11, Appendix A.2 Chapter 16; Probl. 41, 45, 49, 53, 57, 68, 71, 73, 77, 81 , 82a, 97
Meeting 5 Read: Homework:	**Acid-Base Chemistry, Aqueous Equilibria** Chapter 17, Section 17.1–17.3 Chapter 17, Problems 15,17,19,23,25, 27, 33,34, 41,43,45
Meeting 6 Read: Homework:	**Aqueous Equilibria and Precipitation** Chapter 17, Sections 17.4–17.7 Chapter 17, Problems 49,51,55,56a, 60,62
Meeting 7 Read: Homework:	**Entropy and Free Energy** Chapter 19 Chapter 19, Probl. 11,12,25,37,,41,43,53,55,57,59,65,67,69,79,82,85
Meeting 8 Read: Homework:	**Oxidation-Reduction, Equivalents, Normality, Electrochemistry** Chapter 4, p.131–137; Chapter 20, Sections 20.1–20.5; page 54 in the lab manual. Chapter 4, Problems 49,50,51 and Chapter 20, Problems 13,14,17,21,23,25,27,37,39,42,45,49
Meeting 9 Read: Homework:	**Electrochemistry** Chapter 20, Sections 20.6, 20.7, 20.9 Chapter 20, Problems 51, 53, 56a,,61, 63, 65, 67,91,92
Meeting 10 Read: Homework:	**Transition Metals, Coordination Compounds** Chapter 23, Sections 23.1–23.5 Chapter 23 Problems 15, 16, 17, 23, 25, 35,36a,e,38,39,4`,41,43,44b,c,

Meeting 11 Read: Homework:	**Coordination Compounds, Hybrid Orbitals** Section 23.6, Sections 9.4, 9.5 Chapter 23 Problems, 50, 53,55, 59,60,61 Chapter 9, Problems 48,51,54,55,56
Meeting 12 Read: Homework:	**Hybrid Orbitals, Periodic Trends** Chapter 9, Section 9.6 and Chapter 22, Section 22.1 Chapter 9, Problems 59,60,61,65,67 and Chapter 22, Problems 11,12,13,15,17b,18d
Meeting 13 Read: Homework:	**Organic Chemistry, Biochemistry** Chapter 24 and Chapter 12, Section 12.8 Chapter 24, Problems 7,8,15,23,24,28 (omit naming), 35, 43, 44, 45, 46, 49a (omit naming) 59, 61, 71a, 78, 81, 85, and Chapter 12, Problems 75, 79a, 80b, 103
Meeting 14 Read: Homework:	**Nuclear Chemistry** Chapter 21 Chapter 21,Probl.7,9,11,12d,17,28,30,33,34 (do this without using a formula),36,39,47,50a,57, 58a

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

Chemistry 2100 Laboratory

You must bring the lab manual to the FIRST lab meeting, since an experiment is done during that meeting.

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 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. New goggles are provided 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 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.

Lab reports are due in lab the week after the experiment was concluded unless you obtain permission from your instructor. 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. All lab reports not handed in will receive a grade of zero.

Students who miss a laboratory:

Multiple sections of Chemistry 2100 run, and students who miss a section of their assigned laboratory may 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.

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

PREPARATION FOR LABORATORY

To help prepare you for lab, you are required to hand in before each lab (except the experiment in week 1) 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.

Schedule of Lab Experiments in Chemistry 2100 (See errata on page 2.)

Meeting	Laboratory Assignment
1	Check in, Safety, and Qualitative Analysis Part I, Exper. 13.
2	Experiment 15 Rates of Reaction. **You MUST hand in the signed safety sheet and the safety quiz.**
3	Experiment 16: *Colorimetric Equilibrium Study*
4	Experiment 14 *Qualitative Analysis II*
5	*Qualitative Analysis II*
6	*Qualitative Analysis II*
7	Experiment 17 Buffers. **Change in procedure.** For the Part III titration, do **not** use the buffer you prepared in Part II. Instead prepare a buffer by adding 20 mL of 0.100 M Acetic acid to 20 mL of 0.100 M sodium acetate (or whatever acetate solution is in the lab); stir this solution. Use this solution for the titration. Go to 16 mL instead of 20 mL added in the titration. Because the titration takes a while, you should do the titration part of the experiment with a partner. The rest of the experiment must be done individually. Also, some people can do Part III before Part II to make more efficient use of the equipment.
8	Experiment 18A (Spring sem.) or 18B (Fall sem.): *Oxidation - Reduction*
9	Experiment 18A (Spring sem.) or 18B (Fall sem.): *Oxidation - Reduction*
10	Experiment 20: *Synthesis and Analysis of an Amminenickel(II) Complex Compound*
11	Experiment 20: *Synthesis and Analysis of an Amminenickel(II) Complex Compound*
12	Experiment 20: *Synthesis and Analysis of an Amminenickel(II) Complex Compound*
13	Experiment 19 *Electrochemical Cells*
14	Check out. NO WORK PERMITTED