

LABORATORY IN ADVANCED GENERAL CHEMISTRY

- Instructor:** Dr. Andrew C. Price
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Office: 313B Pfahler Hall
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- Lab meetings:** Tu 1:30-4:20 P.M.; Pfahler 007 (pre-lab) and Pfahler 215 (lab)
- Office hours:** M W F 10:00 – 10:50 A.M.; M W 3:00 – 4:00 P.M., and by appointment
- Description:** Laboratory work related to CHEM-151. Experimental work may include topics in stoichiometry, chemical structure and bonding, thermodynamics, equilibrium, and kinetics. This course must be taken concurrently with CHEM-151. Three hours of laboratory per week. *One semester hour.*
- Textbook:** Required: Inquiries into Chemistry, by Michael R. Abraham and Michael J. Pavelich; 3rd Edition; Waveland Press, Inc., 1999; ISBN: 1-57766061-7
- Course objectives:** Chemistry is an experimental science and one cannot appreciate its beauty without spending some time in the laboratory. One of the principal aims of the experiments in this course is to teach you stoichiometric concepts through the analysis of various chemical compounds. In the process, you will be introduced to a variety of useful skills. You will learn to use quantitative glassware, electronic balances, computers, and modern chemical instruments. You will also be trained in proper record keeping and in the writing of accurate, concise, and informative reports. We hope that, by performing the experiments described in this manual, you will develop confidence and the careful technique needed to obtain reliable scientific results.

Grading and Approximate Grades:

		<u>Points</u>
Laboratory Reports		500
Laboratory Notebook		50
Final Exam (open book)		150
TOTAL		700
<u>Grade</u>	<u>%</u>	<u>Points</u>
A	90 - 100	630 - 700
B	80 - 89	560 - 629
C	70 - 79	490 - 559
D	60 - 69	420 - 489
F	0 - 59	0 - 419

Attendance policy: In keeping with a strong liberal arts tradition that encourages active learning and complete participation in the education process, the college expects students to attend class. Specific attendance policies are set by individual instructors and indicated on the course syllabus at the beginning of each term. Warning slips will be issued by instructors for all students failing to meet the stated course attendance policies. Excessive absences by first year students and students on academic probation will be reported to the Dean's office. Students may be dropped from a course with a grade of F for failing to meet the stated policy. **The stated policy for this course is that you must attend every scheduled lab.** Exceptions will only be made in rare cases for documented illnesses or family emergencies, at the discretion of the instructor. In such instances, it will be expected that you make up the missed work at some later time.

Inclement weather: In the event of inclement weather that might necessitate the cancellation of a class, please call my office phone and listen carefully to my message machine and/or check your email. In the event of a cancellation, the class will discuss a suitable time to make up the missed material.

Academic Honesty: Ursinus College is a small community, which functions on a social contract among students, faculty, administration, and alumni. In order for the spirit of community to endure and thrive, this agreement, based upon shared values and responsibilities and a sense of mutual respect, trust, and cooperation, must be preserved. Students have an obligation to act ethically concerning academic matters and the faculty has a responsibility to require academic honesty from students and to be vigilant in order to discourage dishonesty. Lying, cheating, stealing, plagiarism, and other forms of academic dishonesty violate this spirit of mutual respect and collaboration and corrode the atmosphere of openness and free inquiry upon which the educational process is based. Such activities are demeaning and potentially damaging to those who undertake them. Moreover, academic dishonesty is damaging to the student body as a whole, in that it cheapens the achievements of the honest majority of students and subverts the integrity and reputation of the institution with which they will be identified for the rest of their lives. Students should be aware that there are many legitimate sources of help available on campus. Several departments, s provide help sessions. There is a writing center run by the Department of English, and the Library provides research help. Tutorial services are coordinated through the Unity House for all disciplines and peer mentoring services are arranged by the Dean's office. The student body, faculty, and administration of Ursinus College therefore unanimously condemn academic dishonesty in all its forms and affirm that it is the responsibility of all members of the college community to prevent such activity.

Statement on Plagiarism: Plagiarism is the act of taking the words--written or spoken-- or the ideas of someone else and passing them off as one's own. You are plagiarizing if you copy exactly a statement by another and fail to identify your source. You are plagiarizing if you take notes from a book, an article, or lecture, express those materials in your own words, and present the result as your work without identifying your source. You are plagiarizing if you copy part or all of a paper written by a friend, another student, or a writing service and offer it as your own work. You are plagiarizing if you take material verbatim from a source (even though the source is acknowledged) without identifying it as quoted material by means of quotation marks. Plagiarism is easy to avoid by using common sense and following the advice and directions for acknowledging sources. Such forms and methods are available from professors and style sheets provided by departments as well as by a composition textbook. Never take notes verbatim or in your own words without using appropriate quotation marks and noting exact sources, including page number of the material. It is the policy of Ursinus College to reject and punish the act of plagiarism. The above has been adapted from, and credit is given to Millward, *Handbook for Writers*, pp. 354-355.

For example, you are cheating if you:

1. Copy answers or use information from a fellow student's paper during a quiz, test, or examination.

2. Divulge answers or information, or otherwise give improper aid to another student during a quiz, test, or examination or accept such aid.
3. Relay or receive any improperly obtained or confidential information concerning a quiz, test, or examination. (Example: if one sees the test before it is to be given and transmits information concerning its contents or whereabouts to other students.)
4. Use or refer to any unauthorized notes, books, calculators, problem solving aids such as "cheat sheets" during a quiz, test, or examination.
5. Collaborate improperly with another student on an open-book or take-home quiz, test or examination; or obtain information from an unsuspecting fellow student during such an exercise.
6. As a proctor or student assistant, divulge confidential information or aid any student in an improper manner during a laboratory exercise, quiz, test, or examination.
7. Commit an act of plagiarism in any form.
8. Borrow under false pretenses, steal or otherwise improperly obtain lecture or research notes, laboratory data, or any information gathered by another student and presents it as your own work (examples: term papers; laboratory reports or experimental yields; computer programs or assignments; English composition themes), or knowingly collaborate with another student by making such material available to him/her.
9. Falsify laboratory data, notes, results, or research data of any type in any course and present it as your own work.
10. Steal or intentionally damage or destroy notes, research data, laboratory projects, library materials, computer software (including the intentional passing of a computer virus), or any other work of another student (or faculty member), out of malice, or for the purpose of sabotaging that person's work and thereby gaining an unfair advantage to yourself.
11. Knowingly and willingly violate any special rules concerning research procedures, group assignments, or inter-student collaboration, which may be established by an instructor in any course.
12. Submit the same work including oral presentations for different courses without the permission of the instructors involved. Since it is expected that different courses offer different learning experiences, students are depriving themselves of an educational opportunity by submitting the same or similar work for more than one course. Examples include but are not limited to submitting a partial or complete paper previously handed into another class, superficially reworking one assignment for submissions to another class. (Example: submitting a sociology paper as an CIE 1 paper.)
13. Misrepresent yourself to an instructor or an administrator for the purpose of gaining special favors or extensions for academic work missed. Examples include but are not limited to lying about your health or the health of a relative, forging doctor's notes.
14. Forge signatures on forms, documents, or letters pertinent to College business. This may include but is not limited to course of study sheets, drop/add forms, or doctor's notes.

You are an accessory to cheating, and penalties may be applied, if you:

1. Witness or have direct knowledge of any of the aforementioned forms of cheating and fail to inform an authorized person (faculty member, administrator, proctor. or student assistant).
2. You bring unauthorized materials into a testing area and fail to or refuse to remove them when instructed to do so.
3. You fail to or refuse to comply with admonitions from a faculty member or authorized proctor to cease any activity, which might aid other students in cheating.

Preparing for Lab: You are required to read the laboratory experiment and any assigned reading prior to the pre-lab lectures. Summarize the experimental procedure on the left hand pages of your lab notebook, and leave room on the right hand pages to answer questions, and prepare data tables, etc. Be prepared to ask questions about the experiment. You are not allowed to have the lab manual with you on your bench as you perform the experiment, therefore it is vital that you familiarize yourself with the procedures as much as possible.

Lab Notebooks: You should purchase a quad ruled composition book containing at least 100 pages. On the front cover write your name clearly and “CHEM-151LQ – Advanced General Chemistry”. Each page should be numbered. The first page should be reserved for a table of contents containing the date the experiment was performed, the title of the experiment, and the page numbers. Use black or blue ink. No pencils! Mistakes should be crossed out with a line like this: ~~a mistake~~, and not obliterated like this: a mistake. You should start a new page for each experiment, which should include the date and the title of the experiment. What follows next is the sub-heading: Objective, and this should be at least two sentences and written in your own words. Summarize the Procedure based on the directions in the lab manual. Make sure you have all the necessary information that will allow you to do the experiment without the need to consult the lab manual. Write the procedure on the left hand pages of the notebook; the right hand page should be reserved for your answers to questions, observation and results from tests you perform, the data that you collect, and any pertinent calculations.

Lab Reports: A hard (paper) copy of your laboratory report should be completed by each student as neatly as possible in black or blue ink. You may use liquid paper on mistakes. Tear out the sheets carefully from the lab manual and trim/cut away the jagged left hand side of each page. You must supply all information requested by your instructor along with any additional directions such as graphs and excel spreadsheets. The reports are due **one week** after an experiment has been completed and should be handed in **at 1:30 P.M. on Tuesdays** (except during October break when the report will be due in lecture on Friday, October 19th). After that time the report will be considered late and a 10% penalty will be deducted from your report grade. **No credit will be given for lab reports that are handed in more than 48 hours late.**

Safety: The following *departmentally-adopted* rules are designed to help ensure that all work done in the laboratory will be safe for you and your fellow students. For more details, refer to the lab manual.

Safety goggles, not glasses, must be worn at all times while in the laboratory. Safety goggles may be purchased from the stockroom. **Any student not wearing eye protection in the laboratory will be dismissed from the laboratory immediately with a grade of F on that laboratory project—no warnings, no exceptions.** If any chemical comes in contact with the eye, the most effective first aid is the immediate flushing of the eyes with a stream of water from the sinks that are equipped with special eyewash attachments.

Bare feet are not allowed in the laboratory because of the occurrence of broken glass and spilled chemicals on the floor. Tops of bare feet are also the most likely recipients of spilled chemicals. Because of this, open-toed shoes, sandals, or clogs are not allowed in the laboratory. Feet must be completely covered, including the heels. Socks are recommended. In order to prevent contact of corrosive chemicals with the skin and to minimize fire hazards, we recommend that you wear loose (old) cotton clothing covering your arms, torso, and legs. Arms should be covered up to the elbow—no tank tops or muscle shirts. The torso area should also be completely covered. Pants or dresses that come down to the ankles must be worn. No shorts, skirts, or kilts. Long hair should be tied back. Students coming to lab with inappropriate attire will be asked to return to their rooms to change.

SCHEDULE OF EXPERIMENTS - FALL 2007

	Date	Experiment	Pages
Aug.	T 28	Introduction; Check-in; Lecture on Fundamentals of Chemistry	
Sept.	T 4	QUIZ I Precipitates, C-2	23 - 28
	T 11	Zinc and Hydrochloric Acid, C-3	29 - 34
	T 18	QUIZ II Spectral Analysis for $\text{Cu}^{2+}_{(\text{aq})}$, C-4	35 - 45
	T 25	Valence Share Electron Pair Repulsion and Molecular Modeling	Hand-out
Oct.	T 2	Dissolution Reactions, D-1	47 - 52
	T 9	QUIZ III Potassium Hydroxide and Hydrochloric Acid, D-2	54 - 60
	T 16	OCTOBER BREAK – NO LAB	
	T 23	Heating and Cooling, D-3	62 - 68
	T 30	QUIZ IV Shifting Reactions, I-4	171 - 175
Nov.	T 6	Acid and Base Classifications, G-1	99 - 106
	T 13	Acid and Base Interactions, G-2	107 - 113
	T 20	Bleach and Bromocresol Green, K-2	203 - 206
	T 27	QUIZ V The Bromination of Acetone, K-3	207 - 211
Dec.	T 4	Check-out; FINAL EXAM 2:45 – 4:30 P.M.	