

## Course Syllabus

General Chemistry I Lab

CHE 120-19L

R: 6:15-9:15PM

SC422

Fall 2008

### Instructor Information

S.A. Oehrle SC341 (office), SC313 (lab), 572-6671  
e-mail: Oehrle@nku.edu  
Office Hours: R: 5:15-6:15PM, and F: 10:00-11:00AM  
Others by appointment

### Corequisite

General Chemistry I Lecture

### Required Text

*Laboratory Manual for General Chemistry I 120L (6th Edition)*, by Hicks, Niewahner, Padolik, and Walters, 2008

### Other Required Material

1) Lab Record Book, Hayden McNeil Publishing, 2) Safety Goggles, 3) Paper Towels or Sponge or Towel, 4) CHE 120 Text (*Chemistry & Chemical Reactivity*, 6<sup>th</sup> Ed., By Kotz, Treichel, and Weaver) is suggested for any supplemental readings and references, 5) USB storage device

### Student Learning Outcomes

CHE 120L fulfills the following NKU chemistry department student learning outcomes:

1. Explain the major concepts and experimental findings in the chemical sciences.
2. Demonstrate the ability to carry out experimental protocols using modern instrumentation and methods.
3. Utilize critical thinking skills to apply concept knowledge and adapt experimental techniques to: a) form and test hypotheses and b) solve scientific problems.
4. Compile, critically evaluate, and interpret scientific information and data.
5. Effectively communicate scientific information through written and oral means.
6. Apply computer technology and other technologies in the comprehension, interpretation, and presentation of the chemical sciences.

### Objectives

The NKU General Chemistry faculty has agreed on the following common learning objectives for CHE 120. A more comprehensive list of learning objectives is available on the course blackboard site.

1. Perform calculations involving chemical and physical processes, use the factor label method, record numerical answers with proper units, and attain proficiency in the proper use of scientific notation and significant figures, including the concept of uncertainty in scientific measurements.
2. Name compounds and ions, write their chemical formulas, calculate their molar masses and percent composition, and determine the empirical and molecular formulas of compounds.
3. Classify substances, reactions, and processes according to various classification schemes.
4. Complete and balance chemical equations, determine whether or not a reaction actually occurs based on chemical and physical properties of the reactants and products, and solve stoichiometry problems.
5. Describe and calculate the energy changes involved in chemical reactions and physical processes.
6. Describe the atomic and electronic structure of the elements.
7. Predict the relative magnitudes of physical properties of elements on their electronic structures.
8. Describe the intramolecular bonding of substances and determine the structures of compounds.
9. Describe properties of real and ideal gases using the Kinetic Molecular Theory and perform calculations based on ideal gas laws.

### Calculators

Programmable and graphics calculators are not permitted during tests or quizzes. Calculators will be necessary for taking tests and quizzes. In no case may calculators be passed from one student to another during a quiz or a test. The lack of an operable calculator will not excuse a student from having to solve a problem

### Email Account

All students are required to provide the instructor with an email address by September 12. Students who do not provide their email address may miss last minute changes to labs, etc. Students who do not provide an e-mail address will still be responsible for the information disseminated. Information such as assignments or changes in the syllabus will often be provided by email. Students are also encouraged to send questions about course material by email. A website for general chemistry students is also available at:

[http://www.nku.edu/~chemistry/general\\_chem/](http://www.nku.edu/~chemistry/general_chem/)

### Preparation for Lab

Students are expected to come to lab with a thorough understanding of the experiment to be conducted that day. The brief pre-lab lecture that will be given by the instructor CAN NOT substitute for student preparation. Therefore, you must carefully read the experiment and all other recommended reading materials BEFORE the class period.

For several of the labs a prelaboratory assignment is included in the lab and should be completed and turned in at the beginning of the class for that particular lab. This requires the student to read the experiment ahead of time; complete the prelab, write out the objective and protocol in the lab notebook, and read all recommended reading materials.

### Lab Record Book

Students will write a protocol before each experiment which may be checked by the instructor at the beginning of each lab. Each experimental protocol will be labeled with date and title of experiment. In addition, a statement of purpose/objective will begin each new experiment. The actual protocol (set of experimental steps one expects to follow) should be written in *bullet* or *numbered* statement forms in the lab notebook as described previously. All information is to be written in ink (black or blue).

Note two important items:

- Data and observations are NOT to be recorded in the lab manual during the experiment, only in the Lab Record Book. These pages will be turned in at the end of each lab. The lab manual data pages are to be used for summary reports.
- Students will not be permitted to do the experiment on a given day until they have read the experiment and written a protocol. Please be careful to follow the syllabus and prepare for the correct experiment each week.

### Lab Reports:

Lab reports for this course will vary in content from week to week. In most cases, the data/observations/results/calculations and post-lab question sections from your lab manual will be required. These pages should be **NEAT** (completed **in pen** or **typed**), as if they were a formal lab report. Therefore, **I STRONGLY ENCOURAGE YOU** to utilize the “electronic” versions of these documents available online. **I will not grade messy lab reports**; you will have to recopy the assignment and will be subject to any applicable late penalties! In addition, most labs will have a different portion of a formal written lab report assigned. These sections are described in your lab manual (page xviii), and I will provide more information as we encounter new sections during the term. These assignments give you the opportunity to refine your report-writing skills and prepare you for other advanced science courses. Unless otherwise indicated, all portions of a lab report are due **at the beginning of the lab period (6:15PM) following the completion of the experiment**. Reports that are handed in after this time will be considered late and will be **penalized 10 percent** of their value per day (including the day the lab was due). Reports will not be accepted if they are submitted more than one week late, and you will receive a maximum of 30 points for these experiments.

The **summary reports** must adhere to the following guidelines:

- The lab report consists of
  - completed lab pages from the lab manual; sample calculations shown (on separate sheets of paper if needed)
  - any data sheets that aren't from the lab manual (i.e. printouts from instruments)
  - answered questions and problems from the lab manual
- The lab report *must be stapled* in the upper left corner with the pages *in the same order* as in the manual. (Points will be deducted if this rule isn't followed).
- The report must be filled out in a neat and orderly fashion. (Points will be taken off for sloppiness).

The **formal reports** must adhere to the following guidelines:

- For two experiments, a formal report is to be submitted.
- Type written
- The description of the formal lab report format given in the Lab Manual should be followed with one change:
  - Combine "Data and Observations" with "Results and Calculations". Label this section "Data and Results" for short, but also include observations and sample calculations.
- NO parts of the lab manual or data sheets can be pasted or attached to the formal labs.
- A sample formal lab report should be available in the lab.

**Group Work:** You will often complete experiments working in pairs or groups. You and your partner(s) may obviously discuss items during the lab and during your computer analysis of the data. However, **lab reports are to be written individually**. If, in the opinion of the instructor, lab reports show too much similarity or collaboration, only one report will be graded and the partners will **split** the grade between them.

**All safety rules must be obeyed. Repeated violation of these rules will result in dismissal from the lab and a grade of zero for that experiment. Habitual violation of Safety Rules during the semester will result in dismissal from the course and a grade of F for the course.**

### Tests

There will be one test given on October 16 and another on December 11. These tests will consist of both a practical portion and a written portion. The practical portion will be worth between 20 and 35% of the overall test score.

### Grading

Each experiment will be graded on a 100 point basis with the exception of the "dry" labs and the Introduction to Measurement lab in week 1 which will count as 50 points. The two formal labs will count for 150 points (50 points for the formal part and 100 points for the actual lab)

Experiments	70% of overall score
Tests	30% of overall score

<u>Overall Score</u>	<u>Letter Grade</u>
90 – 100	A
80 – 89	B
70 – 79	C
60 – 69	D
0 – 59	F

**Note: A grade of a C or better is needed in this course to enroll in CHE 121L!**

Most experiments are graded on the basis of protocol (10%), recording of data and observations (10%), carrying out the experiment (basically a participation grade) (10%), prelab (10-12%), results (usually 10% - 25%), calculations (5% - 15%), significant figures (5% - 10%), recording data to the proper position (3 - 5% each type of entry), graphs (5% - 10%), and post-laboratory questions (2% - 5% each).

If a student does not hand in a report, they are assigned a default grade of 30 assuming that their protocol, records, and work were done properly. Generally, a student who completes the experiment and hands in a report that shows a reasonable effort but a lack of understanding of the experiment is given a default grade of 60. A student who completes the experiment and hands in a report that suggests little or no effort in doing the calculations, answering questions, etc. will be given the default grade of 30.

### Attendance

The department policy with regard to makeup labs is as follows:

*Each student in a General Chemistry Lab will be allowed to make up the experiment for two excused absence during the semester. An excused absence is one for which the student has a good reason (something beyond the student's control) for not being able to attend the regularly scheduled lab period. The student must contact their laboratory instructor either by phone, e-mail (preferably) or letter within 2 weekdays (M,T,W,R,F) of the missed lab. A student who waits longer than 2 weekdays after a missed lab to request a make up will normally not be allowed to make up the lab experiment and will be assigned a grade of zero for that experiment. The student will be expected to verify their reason for requesting an excused absence. The lab must be made up no later than the last lab period of the week following the scheduled experiment. The student must also obtain permission from the make up lab instructor. Absences beyond two will each be assigned a grade of zero no matter the reason*

### Cell Phones

Cell phones, pagers, and all watch alarms should be turned off (or placed on silent) during class. Furthermore, cell phones and pagers must be put away during class. Should you receive a phone call that you must answer, please quietly leave the lab to do so (do not abuse this privilege or it will be taken away). Should your device audibly ring during lab, you will be asked to leave with no further discussion and not be eligible for a lab makeup. **Use of a cell phone or pager during an exam will be considered cheating**, and appropriate actions will be taken by the instructor.

### Miscellaneous

- All items on this syllabus are subject to change by the instructor.
- Students are responsible for reading and understanding all items on the syllabus. Any items not understood must be brought to the attention of the instructor within the first two weeks of class.
- Faculty members reserve the right to dismiss or to have removed a disruptive student from their classrooms.
- Students with disabilities who require accommodations (academic adjustments, auxiliary aids or services) for this course must register with the Disability Services Office. Please contact the Disability Service Office immediately in the University Center, Suite 320 or call 859-572-6373 for more information. Verification of your disability is required in the Disability Services Office for you to receive reasonable academic accommodations. Visit the Disability Services website at [www.nku.edu/~disability/](http://www.nku.edu/~disability/).
- No food or drink is allowed in lab, including open water bottles.
- A **C or better** is needed in this course to enroll in CHE 121L (a similar policy is in effect for CHE 120).

### Tentative Schedule, Thursday PM, Fall 2008

Aug. 28	Pref. & Intro	Check-in, Safety Program, Intro. to Measurement (handout)
Sept 4		Laboratory Measurements (p.67)
Sept. 11		An Introduction to Chromatography (p. 59)
Sept. 18		Physical and Chemical Properties (p.93)
Sept. 25		Empirical Formula of Zinc Iodide (p. 53)
Oct. 2		Synthesis of Alum (p. 99)
Oct. 9		Chemical Reactions (p. 33)
Oct. 16		<b>Test 1</b> Experiments through Alum
Oct. 23		A Cycle of Copper Reactions (p. 45)
Oct. 30		Acid/Base Titration (p. 9)
Nov. 6		Calorimetry and Hess's Law (p. 19)
Nov. 13		Titration of Bleach (p. 105)
Nov. 20		Absorption Spectroscopy (p. 1)
Dec. 4		Lewis Formulas, Formal Charge, and VSPER (p. 77)
Dec. 11		<b>Test 2</b> Experiments: Chemical Reactions through Lewis Formulas Check out

### Some Important Dates:

Sept. 1	Labor Day-No Classes
Sept. 15	Last day to drop a class without a grade appearing
Oct. 20-21	Fall Break-no classes
Nov. 3	Last day to drop a course with a W
Nov. 26-28	Thanksgiving holiday-no classes