

CHEM 1111 Spring 2011

**COURSE NAME/NUMBER/TITLE:** Principles of Chemistry I Laboratory, CHEM-1111, 1 credit hour

**PREREQUISITE/COREQUISITE:** CHEM-1311 – Principles of Chemistry I

**DESCRIPTION OF COURSE:** Laboratory course to accompany Principles of Chemistry I

**TEXTBOOK AND AUTHOR:** *Laboratory Manual Principles of Chemistry*, A. G. Foster, 2003 Revision

**OBJECTIVES AND GOALS OF COURSE:**

The primary objectives of this class are:

1. To complement the lecture class, CHEM-1311.
2. To learn the proper use of laboratory equipment and instruments.
3. To perform experiments, collect data, observe and evaluate results.
4. To learn correct and safe laboratory techniques and procedures.

**PERFORMANCE/LEARNING OBJECTIVES:**

Upon completion of this course, the student should be able to do the following with a competency level of at least 70%:

1. To develop laboratory skills and techniques.
2. To interpret data collected in experiments.
3. To write acceptable laboratory reports.

**REQUIRED EXAMS:**

The student is required to take a safety quiz and pass the quiz during the first laboratory period. The student may not participate in laboratories until the safety quiz has been completed and passed. Failure to complete the safety quiz will result in zeros on all subsequent labs until the student has watched safety video and the safety quiz has been completed.

There will be a comprehensive test at the end of the term. Pop quizzes over the pre-labs will be given online the week prior to the lab. The final grade will be determined by the grades on your laboratory reports, post labs, quizzes and the comprehensive test. If the student does not take the comprehensive test, the student will receive an "F" in the course. The use of graphing calculators and programmable calculators is **not permitted** on the comprehensive test. The student may use them throughout the term in the laboratory, but **may not** use them on the comprehensive test. The grades will be calculated as follows:

Lab reports	70%
Post labs	5%
Quizzes	10%
Exam	15%

Students will be responsible to maintain their own averages throughout the course of this class. If the student wants to know his/her average, then it may be calculated using the above percentages.

Hats will not be allowed to be worn in the classroom when we take an exam. This rule stands for both men and women. This is common courtesy. If the student chooses to wear a hat to class when we take an exam, please remove it before entering the classroom and place it under the desk.

#### **ATTENDANCE POLICY:**

Students are expected to attend every lab and arrive on time to class. Should a student miss a lab, the lab may only be made up with **prior** arrangements from the laboratory instructor teaching another section.

#### **OTHER INFORMATION:**

You will be required to purchase **safety goggles** (NOT safety glasses – these are not acceptable for this class) and an apron (or laboratory coat). These are to be worn **at all times** in the laboratory. It is important that we have a safe laboratory environment so there are some rules regarding clothing. **NO open shoes** – they must be closed in the toe area. **NO hats** in the lab – bills and rims are a splash hazard. **NO shorts** may be worn in the laboratory (shorts are defined as clothing that does not cover the knee when standing). Long hair **must be** tied back away from your face. NO food or drink is allowed in the laboratory.

Failure to check out of the laboratory will result in the loss of a letter grade. i.e. The student gets a “B” in the course, but forgets to check out of lab, thus s/he will actually receive a “C”.

#### **STUDENT CONDUCT AND RESPONSIBILITIES**

Information taken from <http://www.actx.edu/student/responsibilities/>

#### **CHEATING:**

According to the Student’s Rights and Responsibilities, “Cheating on a test” is the following:

- a. Copying from another student’s paper.
- b. Using test materials not authorized by the person administering the test.
- c. Collaborating with or seeking aid from another student during a test without permission from the test administrator.
- d. Knowingly using, buying, selling, stealing, or soliciting, in whole or in part, the contents of an unadministered test.
- e. The unauthorized transporting or removal, in whole or in part, of the contents of the unadministered test.
- f. Substituting for another student, or permitting another student to substitute for one’s self, to take a test.
- g. Bribing another person to obtain an unadministered test or information about an unadministered test.

If the student is caught cheating, the laboratory paper **may not** be a drop grade – it **will** count. The laboratory paper will be taken up and a zero (0) will be recorded. Cheating in lab constitutes as copying previous papers (if the student has already taken the lab) or copying other students papers (who have already taken lab) or copying a student currently enrolled.

#### **OTHER INFORMATION:**

“The following types of behavior shall be prohibited:....”

“Using tobacco or tobacco products inside any College building.”

This statement means that the student may not chew tobacco, dip, (or any other slang word he/she may use) in Warren Hall. That is included in classrooms as well as laboratories. If the student is caught using tobacco or tobacco products disciplinary action may be taken.

**GENERAL INFORMATION:**

Laboratory reports will be turned in at the end of each laboratory period unless otherwise instructed. Late work will result in a deduction of 20 points **per day** late (this includes weekends). The lowest laboratory experiment grade will be dropped when the final grades are calculated. Each experiment is preceded by a pre-lab exercise that is to be turned in at the **beginning of the laboratory** period. These are graded as acceptable or unacceptable. Unacceptable or late pre-labs may result in a deduction of up to 20 points from the experiment grade. Each experiment also has a post-lab exercise. These post-lab exercises are due **at the beginning of the next laboratory** meeting.

**OTHER GRADING INFORMATION:**

significant figures	- 2 points each
labels	- 1 point each
using white-out	- 5 points each time
not writing in ink in gray areas	- 5 points each
calculational errors	- 5 points each
not drawing one line through mistakes	-1 to -5 points each
not showing work when asked	up to half the points of the problem each
writing in ink over pencil	- 5 points each
writing in pencil in grey areas	- 5 points each

Please turn off cell phones and pagers during class. It is disruptive and disrespectful to your classmates to have a phone ringing during class. If it is a necessity to have a phone or pager on, please see me about it during the first week of class.

**POINTS WILL BE TAKEN OFF FOR THE FOLLOWING:**

If I cannot read the student's work, I will not decipher it. The student needs to write so that credit can be given. If handwriting cannot be read, no credit will be given. If numbers cannot be read, no credit will be given. Please write legibly so that full credit may always be given. The student is responsible for spelling all elements correctly in the course as well as all other words. I will not try to figure out what the word is in order to give credit.

**“Any student who, because of a disabling condition, may require some special arrangements in order to meet course requirements should contact disAbility Services (Student Service Center Room 119, Phone 371-5436) as soon as possible.”**

**COURSE OUTLINE**

The following is a list of the concepts covered in each experiment. If the student has at least a

moderate understanding of these concepts before coming to lab, s/he will be less frustrated and more likely to have a satisfying experience.

Date	Exp	Title
1/24		Introduction to Laboratory and Laboratory Safety (Safety Quiz)
1/31	1	Density Measurements <ul style="list-style-type: none"> <li>• significant figures</li> <li>• rounding</li> <li>• scientific notation</li> <li>• rules for adding/subtracting and multiplying/dividing with significant figures</li> <li>• the rule for writing directly in ink on the student's report sheet</li> <li>• need a calculator</li> <li>• need a pen and a pencil</li> </ul>
2/7	2	Nomenclature Drill <ul style="list-style-type: none"> <li>• nomenclature rules</li> <li>• name compounds and writing formulas</li> <li>• need a pencil</li> </ul>
2/14	6	Determination of Percent Water in a Hydrate <ul style="list-style-type: none"> <li>• know how to find the % of water in a hydrate formula</li> <li>• significant figures</li> <li>• know how to calculate hydrate</li> <li>• know how to calculate anhydrous</li> <li>• need a calculator</li> <li>• need pencil</li> </ul> need notebook paper for notes
2/21	7	Stoichiometry of Chemical Reactions <ul style="list-style-type: none"> <li>• know how to write balanced equation in correct states</li> <li>• know how to do stoichiometric calculations</li> <li>• need a periodic table</li> <li>• need a calculator</li> <li>• need pencil</li> <li>• need pen</li> <li>• need to know how to do mole to mole, mole to gram, gram to mole, etc. conversions</li> <li>• need to know % yield</li> <li>• significant figures</li> </ul> need notebook paper for notes

2/28	4	<p>Precipitation Reactions and Ionic Equations</p> <ul style="list-style-type: none"> <li>• what is a precipitate?</li> <li>• what is a solid?</li> <li>• know the difference between molecular, net ionic and total ionic equations</li> <li>• memorize solubility rules</li> <li>• what does no reaction (NR) mean?</li> <li>• difference between ion and element</li> <li>• know states (i.e. aq, s, l, g) and when to use them</li> <li>• need pencil</li> <li>• need notebook paper for notes</li> </ul>
3/7	5	<p>Conductivity in Aqueous Solutions</p> <ul style="list-style-type: none"> <li>• know strong acids, weak acids, weak bases, strong bases</li> <li>• know soluble salts, insoluble salts (see Exp 4)</li> <li>• know how to write balanced equations (3 steps)</li> <li>• know how to write acid + carbonate yields what?</li> <li>• know how to write acid + base yields what?</li> <li>• know about strong electrolytes, weak electrolytes</li> <li>• need pencil</li> <li>• need notebook paper for notes</li> </ul>
3/21	3	<p>Basic and Acidic Oxides</p> <ul style="list-style-type: none"> <li>• what is an anhydride?</li> <li>• know states (i.e. aq, s, l, g) and when to use them</li> <li>• how to balance equations</li> <li>• bases turn litmus paper?</li> <li>• acids turn litmus paper?</li> <li>• need pencil</li> <li>• need notebook paper for notes</li> </ul>
3/28 & 4/4	8 (2 weeks)	<p>Acid–Base Titration and Determination of the Equivalent Weight of Unknown Acid</p> <ul style="list-style-type: none"> <li>• definitions: end point, indicator, standards, equivalent weight, normality</li> <li>• have read through entire procedure</li> <li>• know how to calculate normality</li> <li>• know how to calculate number of equivalents</li> <li>• know how to calculate equivalent weight</li> <li>• need pencil, pen and calculator</li> <li>• need notebook paper for notes</li> </ul>
4/11	9	<p>Molar Volume of Oxygen Gas at STP</p> <ul style="list-style-type: none"> <li>• know the ideal gas law</li> <li>• need pencil, pen and calculator</li> <li>• know percent error</li> <li>• need notebook paper for notes</li> </ul>

4/18	10	The Equivalent Weight of a Metal <ul style="list-style-type: none"><li>• know the molar volume of a gas at STP</li><li>• need pencil, pen and calculator</li><li>• need notebook paper for notes</li></ul>
4/25	11	Preparation and Properties of Colloids <ul style="list-style-type: none"><li>• definitions: condensation, dispersion, peptization, emulsion, emulsifying agents, dialysis, Brownian movement, adsorption, protective colloids</li><li>• need pencil</li></ul>
5/2		Check-out and Comprehensive Test