

Chemistry 121-Gammon

General Chemistry 1:	5 Credits
Lecture:	10:00-10:50 PM Mon, Tu, Th, Fri
Instructor:	Professor Steven D. Gammon CB244 (650-2825)
E-mail:	gammon@chem.wvu.edu
Home Page:	http://gold.chem.wvu.edu/SDGChem121
Office Hours:	MTR 11:00-12:00 and by appointment

Chemistry 121 has a Prerequisite of Math 114 or Equivalent on the math placement test.

INTRODUCTION. Chemistry 121 is the first quarter course of a three quarter sequence. The second quarter course is chemistry 122 followed by chemistry 123. The first year of chemistry is designed to provide a general background concerning the principles and factual basis of chemistry as well as introduce some basic laboratory techniques. The 121-123 sequence is designed to serve as a prerequisite for more advanced courses in chemistry, science and related fields.

Chemistry 121 often proves to be quite rigorous. Studies have shown that much of the difficulty that students have with introductory chemistry can be traced to poor mathematics preparation. Please be aware that if you have difficulty with algebraic manipulations, you are going to have to put in extra time to learn both the math and the chemistry that is based on the math. Throughout the course, emphasis will be placed on **your** understanding the subject and learning to think effectively in solving scientific problems. However, to think effectively and to understand the problems, it is necessary to have a basic knowledge of facts and terms: a vocabulary of chemistry. For success, it is essential that you commit yourself to learning this basic vocabulary.

Textbooks and Other Required Items

1. *General Chemistry*, 8th Ed., Ebbing and Gammon, Houghton Mifflin (2005).
2. An inexpensive calculator is **required** for exams or quizzes; **this calculator must not allow text entry, graphing, or computer linking.** It should have capabilities for square roots, logarithms and exponentiation (antilogarithms) and exponential (scientific) notation operations. The calculator will be used on exams, quizzes; **text entry calculators will not be permitted on exams.**
3. Goggles (Purchased at Bookstore)

GENERAL COURSE INFORMATION

Web Site: A key component of this class is the course web site. Early on, you need to familiarize yourself with what is available and delivered via the course web page (<http://gold.chem.wvu.edu/SDGChem121>). It pays to check the “Announcements” portion of the web site often in order to read breaking information and catch up on things that you might have missed during class.

Lectures: During lectures we will discuss principles, outline goals and present illustrations and demonstrations. You should read the textbook prior to lecture and take your own notes during lecture. After lecture you should re-read and study the appropriate pages in the textbook. Be sure that you understand the examples and try to work the corresponding exercises at the ends of the chapters. Assigned exercises come from the group of problems at the end of each chapter. Answers to odd-numbered problems are in the back of the book.

This course will put heavy emphasis on your learning the material. In order to succeed with this class it is essential that you read the book and complete the homework assignments. In many cases, the lecture will not be able to cover all of the assigned material. At certain times, worksheets will be handed out in the lecture.

Laboratory: In order to participate in the laboratory, you *must* pass the online safety quiz during its scheduled times. If you cannot successfully pass the quiz, you will fail or be dropped from this course. Access the quiz schedule and instructions at: <http://argon.chem.wvu.edu/GCQLink.htm>

All laboratory materials are available via links on the course web site (labs and prelabs). You need to download and read the experiment prior to your laboratory meeting each week; the laboratory schedule is the last page of this document. ***Before each lab meeting, you will need to complete an online prelab.*** The prelab questions are based upon information presented in the experiment. In laboratory you will have the opportunity to experience directly some of the relationships discussed in lecture and textbook and to apply experimental techniques to solving chemical problems. Laboratory work is, by nature, slow compared with text reading. You will succeed only with adequate preparation.

The laboratory experiments will be graded on a 10-point scale. In order to pass the course, you *must* complete all of the experiments. If you expect to be absent from a lab, the instructor must be notified *in advance* of the laboratory meeting. Each unexcused absence from laboratory will result in 2% being deducted from your weighted percent total grade. More than two unexcused laboratory absences will result in automatic failure of the course.

Computer Exercises (Online Homework): An important part of this course is the online homework assignments. Every chapter will have a set of online homework questions that you need to complete online before the due date (the due date and link will be posted on the course web site). These assignments will be automatically graded. Prior to the due date for each assignment, you are encouraged to get help working the problems; however all answers should

be the result of your own work. The online homework sets are designed to help you gain mastery of problem solving and concepts. In addition to online homework, in order to do well in the class, as a minimum, you should complete the assigned text exercises.

Exams: There will be two exams administered in class and a two-hour final exam. Check below for the examination dates and times. Text entry calculators will not be allowed for taking exams or quizzes. Exams will be given in the class meeting room (SL110). **Arrangements must be made in advance if you have a conflict with the scheduled exams.**

The final exam will be comprehensive and will cover topics from the entire semester outline as well as those covered after the second exam. All exams may include questions based on laboratory as well as lecture, text and online homework. The in-class exams will be a combination of multiple choice and written answers. The final exam will be only multiple-choice format.

Grading: Your course grade will be based on three major components:

- 1) your performance on exams;
- 2) your performance on online homework;
- 3) laboratory performance;
- 4) Your grade will be based on a weighted percentage: two hour exams (46%), final exam (32%), online homework (16%), and laboratory (6%);
- 5) Presented in the following table is the grading scale for the class; plus and minus grades will be assigned close to percentage break points. **(No extra credit points are available).**

Grade	Weighted Percentage
A	88-100%
B	76-88%
C	64-76%
D	52-64%
F	< 52%

Exam Schedule

Exam I 10:00-10:50 PM Friday, October 20
 Exam II 10:00-10:50 PM Friday, November 17
 Final Exam 8:00-10:00 AM Tuesday, December 12

Make-up of Exams I and II will be given early only in cases of legitimate conflict. Arrangements must be made in advance for a make-up exam. The final exam will not be given early under any circumstances. **Do not buy plane tickets or make other arrangements to leave prior to the scheduled final exam; in fairness to everyone in the class, there will be no exceptions to the posted schedule.**

Course Outline

Chapter 1-Chemistry and Measurement
Chapter 2-Atoms, Molecules and Ions
Chapter 3-Calculations with Chemical Formulas and Equations
Chapter 4-Chemical Reactions: An Introduction
Chapter 7-Quantum Theory of the Atom
Chapter 8-Electron Configurations and Periodicity
Chapter 9-Ionic and Covalent Bonding
Chapter 10-Molecular Geometry and Chemical Bonding Theory

Assignments: The purpose of the problem assignments and information to be memorized is to provide you with an indication of what it is important to study and to help you learn the material.

Examinations will include a significant number of problems. These problems will probably not be identical to those listed below, but they will cover the same topics. If you *understand* how to solve these problems you will be able to figure out how to approach those you encounter on examinations. Although the problems will not be collected and graded, you are strongly encouraged to work them out at the same time that a given chapter is being discussed in lecture. If you do not understand how to do one or more of the problems, get help.

The online homework system is another means of exposing you to problems. In order to be successful in the course you need to do **both** the homework problems in the text and the online homework problems.

The material listed to be memorized is fundamental vocabulary that you will need in order to succeed in this course. The sooner you know the names and symbols of common elements, metric prefixes, etc., the easier the course will proceed. Material to be memorized may already be familiar to you from previous classes; however, it is listed here so that you will know exactly what will be expected on examinations. For example, it is assumed that after the first two weeks of class you are aware that "Be" represents beryllium. The amount of memorization listed here is fairly small; you are encouraged to work on it right away-don't wait until the night before the exam.

The Problems shown below are the **minimum** that you should attempt; it is often wise for you to try more of the problems than just those assigned below.

Problems to Start With

Chapter 1. Chemistry and Measurement

Problems: 14, 17, 21, 22, 25, 27, 28, 29, 41, 45, 49, 51, 53, 55, 57, 61, odds: 67-85, 103, 117, 119, 123, 125, 129, 135, 152

Memorize: Names and symbols for elements 1 – 38. (Do not memorize the periodic table.)

Chapter 2. Atoms, Molecules, and Ions and Oxidation numbers: Pages 145-148 in Chapter 4.

Problems: Chapter 2: 17, 18, 21, 22, 24, 25, 26, 29, 30, 33, 37, 39, 45, 49, 51, 53; Odds: 57 - 95, 101, 103, 105, 111, 113, 115, 132, 136

Chapter 4: 49, 51, 53

Memorize: Names and symbols for elements 47 - 56, 78 - 86. (Do not memorize the periodic table.)

Chapter 3. Calculations with Chemical Formulas and Equations

Problems: 1, 3, 4, 7, 8, 9, 10, 13, 14, 16, 18, 19, 20, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 43, 45, 49, 53, 55, 57, 63; Odds 69-89, 93, 99, 101, 105, 121

Chapter 4. Chemical reactions: An Introduction

Problems: 1-9, 11-14, 15, 17, 18, 19, 20, 21; Odds: 23-95, 101, 103, 111, 115, 146

Memorize: Table 4.1 and Table 4.3

Chapter 7. Quantum Theory of the Atom

Problems: 4, 6, 10, 11, 19, 23, 24, 25, 27, 28, 29, 31, 35, 37, 39, 41, 45, 47, 63, 65, 73, 75, 79, 97

Chapter 8. Electron Configurations and Periodicity

Problems: 3, 5, 11, 12, 14, 17, 27, 29, 31, 33, 34; Odds: 37-61, 73, 79, 83, 91

Chapter 9. Ionic and Covalent Bonding

Problems: 2, 4, 6, 8, 9, 12, 13, 14, 15, 16, 19, 21, 22, 25, 26, 27, 28, 29, Odds: 35-81, 89, 91, 97, 121

Chapter 10. Molecular Geometry and Chemical Bonding Theory; Sections 10.1-10.4

Problems: 2, 3, 4, 7, 8, 9, 17, 21; Odds: 23-39, 43; Odds: 59-67, 89

Laboratory Assignments for Chemistry 121

The laboratory is an integral part of the course. You are expected to attend all the laboratory meetings listed below. **These labs have an online prelab exercise that must be completed before you come to lab.** The prelabs and labs are available for download at <http://gold.chem.wvu.edu/labs/Chem121/Default.htm>.

Lab Dates (T, W, R)	Experiments
10/3-5	Check-in Introduction to Measurements
10/10-12	Solutions & Dilutions
10/17-19	Copper Chemistry
10/24-26	Types of Chemical Reactions
10/31-11/2	Electrical Conductivity of Electrolytes
11/7-9	Analysis of Vinegar
11/14-16	Iodometric Determination of Copper
11/21-23	NO LAB - Thanksgiving Holiday
11/28-30	Nine Solution Problem
12/5-7	Check-out; Molecular Geometry & Bonding