

**Applications of Chemistry (CHEM 0 55)**  
**Fall Semester, 2006**  
**Temple University**

**Instructor:** Dr. Allan E. Thomas

**Lecture:** MWF 1:40-2:30 p.m.      **Room:** BE 164

**Laboratory:** BE 117

**Office:** BE 102

**Phone:** (215) 204-5899

**E-mail:** Allan.Thomas@temple.edu

**Statement of Teaching Philosophy**

Chemical education is in a state of constant flux. Students enrolled in chemistry need an insight into both theory and practice. Though the basic concepts have not changed for many years, the method of teaching these concepts certainly has. A clear understanding of the concepts and principles in chemistry seldom results when students take copious notes. For most students, demonstrations and active participation are extremely important to achieve understanding of these concepts. The underlying philosophy of this author is that teaching is a joint enterprise between professor and student. With the advent of computers, the internet, and CD-ROM, students have the potential of learning at a much faster rate than in previous years. It is the advantage of students and their professors to take advantage of all these technologies.

The preparation of General Chemistry students varies widely, and our objective must be to make the material understandable to the student without distortion or oversimplification. Although chemistry is everywhere, and without it life would be impossible, an excited anticipation of learning chemistry is not evident among the majority of students. Instead, students often approach the study of chemistry with considerable apprehension. The program is designed to help students to see how chemical principles and concepts are developed, and how these principles can be used to explain phenomena observed in daily life as well as in the laboratories. Special attention is given to problems we face today and the attitudes, understandings, and skills that will help the students analyze carefully and act wisely on issues that will confront us all as citizens in our technological world.

**Course Objective:** This course is an introductory course developed to prepare you to be successful in General Chemistry I (C 071) and II (C072). It is designed to familiarize you, the student, with qualitative and quantitative aspects of chemical sciences. This course will also help you to develop the mathematical skills needed for the understanding of the many chemical principles, and concepts found in chemistry. You will also develop critical thinking skills necessary for the solving of scientific problems not only in this course, but in the many courses that lie ahead.

**Course Format:** All sections will meet in a common lecture format Monday, Wednesday and Friday, and recitation which meets one hour per week. In each class: lecture, discussions, questions and answers, practice and problem-solving sessions will take place.

**Required text, Lecture:** *Basic Chemistry*, by Karen Timberlake, Pearson/Benjamin Cummings, 2005

**Laboratory:** *Laboratory Manual for Introductory Chemistry*, 3<sup>rd</sup> Ed., Kimbrough, Gloffke, Pearson/Benjamin Cummings, 2007

**Other required material related to course:** Calculators with Scientific Notation and Logarithms. It is your responsibility to keep your calculator in good working condition, and to bring to class at all times. The sharing of calculators during quizzes and examinations is not permitted.

Study Guide with Selected Solutions for *Basic Chemistry*, by Karen Timberlake

Special Edition of the Chemistry Place™ for *Basic Chemistry*, [www.aw-bc.com/chemplace](http://www.aw-bc.com/chemplace)

The Chemistry Tutor Center, [www.aw-bc.com/tutorcenter](http://www.aw-bc.com/tutorcenter)

(Ms. Dara Lanier, representative from Pearson/Benjamin Cummings, will attend lecture, Friday, September 1, 2006 to demonstrate how to use related software for *Basic Chemistry*.)

**Grading in CHEM 55 (Lecture):**

Three unit exams, multiple choice (100 points each) .....	=300 points
Five Quizzes (recitation) problem solving (20 points each) .....	= 100 points
Chapter and Cumulative Quizzes form <i>Basic Chemistry</i> .....	= 200 points
Skill checks (10 points each).....	= 100 points
One Final Exam, cumulative, multiple choice (400 points) .....	= 300 points

**Total points ..... = 1000 points**

**Course Grading Scale:** Percentage: 100%-92%: A, 91.9%-90%: A-, 89.9%-87%: B+, 86.9%-83%: B, 82.9%-80%: B-, 79%-78%: C+, 77%-74%: C, 73%-66%: D, 65%-0%: F.

### **Unit Exams and Quizzes:**

The dates for the three (3) unit exams are on the schedule (see page 4). As reinforcement, each exam will be cumulative. You will be given one hour to take each of these exams. One Final Exam will be given during finals week. Two hours will be allowed for this exam. The exam schedule will not change so make all appropriate arrangements to be in class on those days. Each Unit Exam will cover three (3) or four (4) chapters. They will be composed of 25 multiple choice (MC) questions. In general, the MC questions will test your conceptual understanding of the material covered, and analytical/critical thinking problems, which involve numerical calculations, will be presented. The dates of these exams will be specified in your syllabus.

There will be five (5) quizzes. The material for the quizzes will often be derived from in-class questions and problems, and/or problems covered during recitation class. The dates of these quizzes will be specified in your syllabus.

### **Skill Checks:**

There will be ten (10) Skill Checks given throughout the course. The Skill Checks will be given in the beginning of lecture class lasting ten minutes. If you are late for the class, you will miss the Skill Checks, You will be allowed to make-up only one (1) in my office.

**There are no make-up exams or quizzes.** If something unavoidable comes up that requires you to miss a testing date, consult with your instructor **before** the quiz or exam. All other absences must be accompanied by documentation of disastrous event. Alternate arrangements can be made if your unavoidable absence is verifiable.

The Quizzes will be short answer or problems involving calculations upon which students must show all work to receive full or any credit.

### **Documentation of Disastrous Events:**

Disastrous events include serious and disabling accidents, doctor-mandated absences directly due to serious illness, and death or serious and disabling accidents in your immediate family. In each case, you are required to document the circumstances of the incident sufficiently so that the instructor can verify the incident. Examples of relevant documents include copies of police reports, hospital admissions papers, and a doctor's note with an explanation of the circumstances including the doctor's name and valid phone number.

If you miss a testing date due to an avoidable circumstance (e.g. oversleeping, getting stopped for speeding, needing to drop someone off or pick someone up, forgetting that there is an exam on that day, etc.) no allowances will be made. If you are late for an exam or quiz due to avoidable circumstances, **no extra time will be provided to you.**

### **Reading Assignments and Representative Practice Problems:**

You are required to actively read the associated chapters in the textbook prior to the dates designated for that chapter's lecture. Active reading includes recognizing the essential concepts, trying the sample exercises, and relating the sample exercises to the end-of-the-chapter questions and problems. **Note:** Some exam and quiz material may come from information provided on the chapter even if its not covered in lecture.

You will be assigned a variety of questions and problems from the end of each chapter. All of them should be used as practice to help you learn the subjects in those chapters. You will not be required to turn in any of the end of the chapter problems however, these problems are assigned to enable your success in this course. Full solutions to these practice problems will be made available on reserve or on "blackboard." By solving these problems, you can develop the necessary skills to do related problems in class, on exams and quizzes.

### **Skill Checking System:**

The Skill Checking System is designed to check and improve your proficiency with critical skill subjects during courses in basic chemistry. Two (2) criteria are use to check, improve, and verify your abilities in these skill subjects: individual performance and exam performance.

### **Library Reserve Information:**

Solutions and answer keys to homework, handouts, worksheets, practice exams, assigned problems, and various other material will be put in a binder and placed on reserve in the library and/or on "blackboard." You will need to

ask for the CHEM 55 binder at the circulation desk. The contents of the binder may ONLY be used in the library. You may photocopy pages for your own personal use. You are responsible for putting all of the pages back in their proper order before returning the binder to the circulation desk. Any misuse of the instructor's binder will result in its removal from the library. You will need to leave your Temple University ID at the circulation desk to check out the binder for use in the library. Library staff members have the authority and the responsibility to set reasonable limits on this reserve material and to prohibit individuals who are abusive from taking materials out. Please respect them.

**Office Hours:**

Office hours are provided for students to ask questions and review material. Students have priority during office hours. Occasionally, office hours may be cancelled or changed for University functions or unavoidable conflicts. Office hours will be posted and announced in lecture class. Necessary changes in scheduled times will always be posted on the door of the office. If you have to ask the instructor a question or you have a concern, please feel free to call my office , 215-204-5899 or send a message via e-mail, Allan.Thomas@temple.edu. I check for messages between 9:00-10:00 p.m., and I will respond whenever possible by 11:00 p.m.

**Academic Honesty:**

It is perfectly acceptable, even advisable, for you to study with your classmates as you work to learn the material in this course. However, even if you study together, you must demonstrate what you, yourself, have learned. Honest behavior includes, but is not limited to the following:

- Providing accurate representations of what you figured out, what you know, and what you understand.
- Providing individualized solutions and distinctive written work on everything you turn in for credit.
- Using only those materials explicitly allowed (e.g., textbooks, handouts, course notes, or any form of paper or electronic "cheat sheets" are forbidden.)
- Seeking and following specific verbal and written directions and instructions.
- Stopping when the time limit is announced during a timed test.
- Resisting the temptation to ask someone else to do your work for you.
- Declining requests to do another person's work for them.
- Resisting the temptation to copy someone else's work, avoiding doing your own work.

All suspicious behavior will be monitored, investigated, and corrective measures will be taken.

**Classroom Behavior:**

Temple University faculty have the right and responsibility to control classroom behavior, including cheating, lateness, rudeness uncivil attitudes, insensitivity which infringes in the rights of students to learn and faculty to teach. The faculty may initiate action to restrain or prohibit improper behavior to include removal from class, dropping from class rolls, reduction of grade, failure of the course, and separation from the University.

**Students With Disabilities:**

Temple University welcomes students with disabilities into the University's educational programs. If you have a disability-related need for modifications or accommodations in this course, contact the Disability Resources & Services, 100 Ritter Annex, 215-204-1280 . For further information regarding DR & S, please visit your student handbook. Instructors should be notified as early as possible regarding the need for modification or reasonable accommodations.

**Applications of Chemistry (CHEM 055)**  
**Fall 2006**  
**Lecture/Recitation Schedule**

<b>Week #</b>	<b>Start Date</b>	<b>Chapter</b>	<b>Topic</b>	<b>Homework</b>
1	8/28	2	Course Overview/Syllabus/ Tools of Success/ Math Skills Measurements	<b>2:</b> Questions & Problems (Q& P) throughout Chapter Chapter Review (CR), Key Terms (KT), 87-110 Odd --- <b>All assignments include the use of the Internet</b> <a href="http://www.aw-bc.com/chemplace">www.aw-bc.com/chemplace</a> <a href="http://www.aw-bc.com/tutorcenter">www.aw-bc.com/tutorcenter</a>
2	9/05	1 3	Chemistry in Our Lives Atoms and Elements <b>Quiz # 1</b>	<b>1:</b> Q & P, CR, KT, 29-43 Odd <b>3:</b> Q & P, CR, KT, 57-89 Odd
3	9/11	4	Electronic Structure and Periodic Trends	<b>4:</b> Q & P, CR, KT, 77-109 Odd
4	9/18	5	<b>Exam# 1</b> Ionic Compounds Naming and Writing Formulas	<b>5:</b> Q & P, CR, KT, 69-95 Odd
5	9/25	6	Molecules and Covalent Compounds <b>Quiz # 2</b>	<b>6:</b> Q & P, CR, KT, 59-86 Odd
6	10/02	7	Math Skills Review & Chemical Quantities	<b>7:</b> Q&P, CR, KT, 59-80 Odd
7	10/09	8	<b>Cumulative Exam # 2</b> Chemical Reactions Stoichiometry	<b>8:</b> Q&P, CR, KT, 61-82 Odd
8	10/16	9	Energy and States of Matter <b>Quiz # 3</b>	<b>9:</b> Q&P, CR, KT, 67-90 Odd
9	10/23	10	Math Skills Review & Gases	<b>10:</b> Q & P, CR, KT, 79-108 Odd
10	10/30	11	Solutions <b>Quiz # 4</b>	<b>11:</b> Q & P, CR, KT, 63-90 Odd
11	11/06		<b>Cumulative Exam # 3</b> Math Skills Review & Kinetics	Lecture notes and handouts
12	11/13	12	Math Skills Review & Chemical Equilibrium	<b>12:</b> Q & P, CR, KT, 49-77 Odd
13	11/20	13	Math Skills Review & Acids and Bases	<b>13:</b> Q & P, CR, KT, 83-106 Odd
14	11/27	14	Math Skills Review & Redox: Transfer of Electrons <b>Quiz # 5</b>	<b>14:</b> Q & P, CR, KT, 45-70 Odd

15      12/04    15      Review For Final Exam  
12/13              **Cumulative Final Exam**              11:00 a.m. - 1:00 p.m.

**Applications of Chemistry (CHEM 0 55)  
Fall Semester, 2006  
Temple University**

**Instructor:** Dr. Allan E. Thomas

**Laboratory:** BE 117

**Office:** BE 102

**Phone:** (215) 204-5899

**E-mail:** [Allan.Thomas@temple.edu](mailto:Allan.Thomas@temple.edu)

**Laboratory:** *Laboratory Manual for Introductory Chemistry*, 3<sup>rd</sup> Ed., Kimbrough, Gloffke, Pearson/Benjamin Cummings, 2007

**Overview:** The laboratory segment of this introductory chemistry course has two objectives: the understanding of chemical theory and the understanding of laboratory principles and techniques. As a beginning chemistry student, you are about to begin a most exciting journey. Chemistry is a laboratory science, and this portion of the course will help you to understand the many concepts discussed during lecture. From the *Introductory Chemistry Laboratory Manual*, hopefully, you will not only understand but also develop an appreciation for the laboratory component of chemistry which include developing basic lab skills, becoming awareness of safety considerations, Learning to collect, organize, analyze, and present data, exercising critical thinking, and understanding the relationships between macroscopic observations and atomic and molecular properties.

**Required material:** Every student must have his/her own calculator with scientific notation and natural and base ten exponent/logarithm capabilities.

**Laboratory Safety:** Students must place book bags, carrying bags in the front corner of the room. Your laboratory manual and writing utensils and calculators are the only items brought to your station. The walkways/isles are to be cleared at all times. Students must cooperate and adhere to the safety procedures designated for each laboratory. Appropriate safety goggles and laboratory aprons/jackets must be worn.

**Data collecting:** In the beginning of the laboratory segment of this course, you will be provided with ready-made data tables. Pay attention as to how they are organized. As the course progresses, you will be expected to create your own data tables and graphs.

**Academic honesty:** Every academic endeavor must be undertaken in a spirit of honesty. Therefore, any indication of academic dishonesty; cheating, plagiarism, falsification of data, etc. will result in a grade of zero (0) for the laboratory and could result in a failing grade for the course.

**Grading in CHEM 55 (Laboratory):**

Each laboratory you attend (you must be present to perform lab exercise) ..... = 10 points  
Laboratory Safety..... = 40 points  
Pre-lab exercises/questions ..... = 10 points  
Completing data tables and graphs ..... = 30 points  
**Total points for each laboratory exercise ..... = 50 points**  
Poster Session ..... = 50 points  
Seminar ..... = 50 points  
Three examinations (3 x 50 points) ..... = 150 points

**Grading Scale:** Percentage: 100%-92%: A, 91.9%-90%: A-, 89.9%-87%: B+, 86.9%-83%: B, 82.9%-80%: B-, 79%-78%: C+, 77%-74%: C, 73%-66%: D, 65%-0%: F.

**Applications of Chemistry (CHEM 055)**  
**Fall Semester, 2006**  
**Temple University**

**Laboratory Schedule**

<b>Week #</b>	<b>Start Date</b>	<b>Lab #</b>	<b>Title</b>	<b>Homework</b>
1	8/29		No laboratory	
2	9/06	1	Check-In & Safety	<b>1:</b> Questions pg. 2-5 Safety in the Lab: Test your Understanding, pg. 5-8
3	9/12	2	Identifying a Mystery Substance: An examination of Physical & Chemical Properties	<b>2:</b> Pre-Lab Exercises p. 11 Complete Data Sheet pg. 13-16
4	9/19	3	An Introduction to Volume & Mass Measurements	<b>3:</b> Pre-Lab Questions p. 21 Complete Data Sheet pg. 26-28
5	9/26	4	A Lesson in Density	<b>4:</b> Pre-Lab Questions pg. 30-31 Complete Data Sheet pg. 34-36
6	10/03	5	<b>Laboratory Exam # 1</b> Ionic Reactions: Precipitates, Solubility, and Metal Activity	<b>5:</b> Pre-Lab Questions p. 42 Complete Data Sheet pg. 44-45
7	10/10	9	Stoichiometry-Gravimetric Analysis of a Gas Forming Reaction	<b>9:</b> Pre-Lab Exercises p. 74 Complete Report p. 76
8	10/17	11	Redox Reactions	<b>11:</b> Pre-Lab Questions pg. 87-88 Complete Report p. 89
9	10/24	15	Salt Solutions: Preparation, Density, Concentration Relationships	<b>15:</b> Review Table 15.1 p.114 Complete Pre-Lab Exercises Complete Report p. 120
10	10/31	18	<b>Laboratory Exam # 2</b> What Color is Red Cabbage? A pH Exercise	<b>18:</b> Pre-Lab Exercise p. 138 Complete Report p. 140
11	11/07	19	Analysis of Commercial Antacids	<b>19:</b> Pre-Lab Questions pg. 144-145 Complete Report pg. 146-147
12	11/14	22	Spectronic-20 Analysis of Aspirin Content in Commercial Products	<b>22:</b> Pre-Lab Exercise p. 121 Complete Report pg. 172-173
13	11/21		<b>Laboratory Poster Session &amp; Seminars</b>	
14	11/28		<b>Laboratory Poster Session &amp; Seminars</b>	
15	12/04		<b>Laboratory Final Exam</b>	

