

## **CHE 107: Principles of Chemistry** (Syllabus subject to change by instructor)

Fall 2009

M W R F 1:30-2:20

Nobel Hall 201

### **Instructor**

Dr. Amanda Nienow

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Office: NHS 106A; Phone: x7327

Office Hours: Monday/Wednesday, 2:30-3:30; Wednesday/Thursday/Friday 10:30-11:30

While I will be available at these times each week, I am also happy to meet with students at other times – meeting with students one-on-one or small groups is the favorite part of my job! If you would like to see me outside of office hours, it is best to contact me in advance to arrange a time. You are also welcome to just stop by my office, but I may not be there or I may be unable to see you if I am occupied with other obligations.

### **Required Materials**

Textbook: Chang, *General Chemistry: The Essential Concepts* (5<sup>th</sup> Edition)

A scientific calculator capable of doing logarithm and exponential calculations (note: you do *not* need a graphing calculator)

*Lab supplies:* Safety goggles, bound carbon-copy lab notebook, and lab packet, all available from the Book Mark. (If you are in Discovery lab, there is a different lab packet.) You must also wear closed-toed shoes for all lab periods.

### **Online resources**

[aris.mhhe.com](http://aris.mhhe.com): This is where you do homework assignments and view homework grades.

[moodle.gac.edu](http://moodle.gac.edu): This is where you can find all other course information and handouts.

### **Overview of Course**

This course provides a basic understanding of key chemistry principles for students who will continue in chemistry and those who will never take another chemistry course. The course therefore focuses on basic principles for the well-informed citizen, and also prepares students for upper-level coursework. Topics covered will include the atom, periodicity, stoichiometry, properties of gases, liquids and solutions, acids and bases, chemical energetics, and bonding. Laboratory work is coordinated with lecture and is intended to illustrate principles and develop experimental skills. This course is taught in several sections, each led by a different professor. We will use the same textbook and laboratory program, and similar syllabi, but the exact material covered, as well as exams, grading, and course policies may vary somewhat from section to section.

### **Course Goals**

- 1) Learning the basic language and principles of chemistry
- 2) Understanding the prevalence of chemistry (and science in general) in modern society
- 3) Fostering critical thinking, and learning to apply it to problem solving
- 4) Develop observation skills and encourage exploration in the laboratory

## Attendance

I do not take attendance for lecture. However, attending every lecture is strongly encouraged. If you miss a lecture, **you** are responsible for getting the information and/or notes covered in class from a classmate—I will not provide it for you. Moreover, you will probably find that what is *said* during lecture is no less important than what is written in your notes, and there is no reliable way to hear what is said without being in class and paying attention. Laboratory attendance **IS MANDATORY**.

## Chapter Objectives

I will provide a set of objectives for each chapter/topic that we cover in this course. These objectives will only be useful to you if you read through them (preferably several times during the coverage of the chapter material). One student may benefit by reading the objectives before he begins to read text material or we begin to discuss the subject in class. This may help that student focus his reading or attention during lecture. Another student may use the objectives after we finish discussing a topic to determine whether she understood/can recall the material. A third student may use the objectives as she begins to study for an exam. She may use the objectives to determine which topic she needs to spend most of her 'study time'. I hope that you find the objectives to be useful to you.

## Grading

Final grades will be assigned according to the following scheme:

Exams (5)	35%
Lab	20%
Quizzes (4)	10%
HW (12)	15%
Peer Mentoring	5%
Final Exam	15%

Note: different items may not be worth the same number of points (e.g. one quiz may be worth 25 points, and another 50 points). However, I do all of my grades based on percentages, so 80% on a 25 point quiz affects your overall grade exactly the same as 80% on a 50 point quiz.

Absolute exam grading scale: Grade ranges for final grades, expressed as a percentage, are:

	B+ 88 - 90 %	C+ 78 - 80 %	D+ 68 - 70 %	F < 60%
A 94 - 100 %	B 82 - 88 %	C 72 - 78 %	D 62 - 68 %	
A- 90 - 94 %	B- 80 - 82 %	C- 70 - 72 %	D- 60 - 62 %	

Curved exam grading scale: Depending on the class performance, at the end of the semester (after the final exam) the cutoffs above may be *lowered* (but they will not be raised) if needed to *raise* the average course grade to between a B- and C+. That is, the above absolute grading scale may be modified by a curve in the favorable direction if warranted.

## Peer Mentoring

To help you develop strong learning skills in the natural sciences and to better understand the ethos of scientific inquiry, students in your BIO-101 and/or CHE-107 section will participate in a new Peer Mentoring program. This program is funded with a grant to the College from the Howard Hughes Medical Institute (HHMI).

Each week, you will meet with a small group of students enrolled in BIO-101, CHE-107 or both which will be led by a talented biology, chemistry or biochemistry major, to learn strategies to help you develop successful learning habits. These include setting reasonable academic goals, forming dynamic study groups, efficient note-taking, competent taking of exams, avoiding plagiarism, and managing time. Other discussions will focus on being a good scientist, formulating and testing hypotheses, analyzing data, and this year's Nobel Conference.

You will sign up for a peer-mentoring group in the Peer Mentoring Center, Room 121, Nobel Hall of Science (NHS) on **Thursday, Sept 10th between 4:30 to 9:00 pm**. If you are enrolled in either BIO 101 Principles of Biology or CHE 107 Principles of Chemistry, you will sign up for a group that will focus solely on that class. If you are enrolled in both BIO 101 and CHE 107, you will sign up for a group that will contain activities that cover both courses. Please **bring your class and event schedule** with you when you sign up for a peer mentoring group to inform your decision about which group to sign up for. Peer mentors will be available to answer your questions during that time.

You will meet with your group and peer mentor once a week in the Peer Mentoring Center, Nobel 121. You will need to *bring a notebook and a writing utensil* to your weekly peer mentoring session. You will not be allowed to use electronic devices of any kind (including phones, ipods, blackberries, personal electronic devices, etc) during your peer mentoring session. Eleven formal sessions are planned for the fall semester including Thursday, Sept 10th and the weeks beginning Sunday, Sept. 13, 20, 27, Oct. 11, 18, Nov. 1, 8, 15, 29, Dec. 6. A summary of the curriculum for the semester will be made available on your course Moodle site. Attendance and active participation in at least eight of the 11 peer mentoring sessions will serve as count toward 5% of your final course grade in participating course sections of BIO-101 and/or CHE-107.

If you have any questions or concerns about the HHMI peer mentoring program, please contact Brenda Kelly, HHMI peer mentoring coordinator at [bkelly@gustavus.edu](mailto:bkelly@gustavus.edu)

## Exams

There will be five exams given in class on/near the dates included in the attached schedule. You are expected to take each exam in class on the day it is given. If you know ahead of time that you will be unable to do so, you may arrange another time to take a make-up exam. If you are unable to take your exam because of a last minute problem (e.g. illness), you must contact me as early as possible (preferably before the exam). Make up exams in such instances will be allowed at my discretion depending on the reason for the missed exam. Be forewarned: make up exams will contain different

questions than the exams given in class; it will therefore not be beneficial to you to see the exam given in class before taking a make up exam.

Exams will be meant to require the full 50 minute class period. You will need to bring your own scientific calculator to each exam (no sharing of calculators is allowed); do not count on me being able to provide one for you if you forget. Exams will contain some combination of multiple choice, true/false, matching, short answer and word problems. Each exam will cover primarily material since the last exam, but since chemistry is a cumulative subject, you will often encounter topics from previous exams by necessity.

Note that Exam 4 is scheduled for the Monday before Thanksgiving. Please keep this in mind when you and your family make travel plans for Thanksgiving.

### **Quizzes**

Quizzes will be similar to exams, only shorter (15-30 minutes each). They may be given in class, online, or as take home assignments. Quizzes will be announced and will be given infrequently during the semester. There are currently four scheduled quizzes. Your lowest quiz score will be dropped, and there will be no make up quizzes - under any circumstances.

### **HW**

Twelve homework assignments will be given during the semester. They will be given online or as take home assignments; online assignments are due at 11:00 am on the due date, take home assignments at the beginning of class on the due date. No late assignments will be accepted. Your lowest homework score will be dropped. An optional assignment (to be one of the graded 11) involves the Nobel Conference. More information on this assignment will be available in class. Only lab is a larger contributor to your total grade than homework (each midterm exam is ~7%, HW is 15%). Be sure to get the HW points!

### **Final Exam**

The final exam will be given on Saturday, December 19 from 3:30-5:30 pm in our classroom. All students must take the final at this time/place as mandated by the college. The final will be formatted like the midterm exams, but it will cover material from throughout the entire course.

### **Lab**

You **MUST** have a passing lab grade to pass the lecture. In other words, if you have a 100% lecture grade and a 25% lab grade, you will automatically receive an F for the entire class. It is very important to attend all lab meetings and to submit all of the required lab work for grading.

It is quite likely that your lab instructor will not be the same as your lecture instructor. If you have questions/concerns specifically regarding the lab (e.g. missing lab or a question about a lab grade), you should contact your lab instructor directly. You will receive information specific to your particular lab (grading, due dates, etc.) in lab.

*A note to students in the “regular” lab:* Detailed instructions regarding make-up lab procedures can (and should) be viewed in the “Lab Attendance Policy” file on the course Moodle site. Dr. Todd Swanson is the contact person if you need to reschedule a lab.

### **Additional Notes**

#### **Quizzes and Exams**

You may write in pen or pencil on quizzes and exams. However, I will not regrade any problems on an exam written in pencil, erasable pen, or pen which has been whited out. (If I make an adding error when totaling an exam grade, I will fix it whether the exam was written in pen or pencil.)

#### **HW**

Homework assignments (with possible exceptions) will be given through the ARIS website. Access to the site is given to each student with the purchase of your textbook. You will need to register on the website in order to access it; registration should be straightforward, but if you do it incorrectly (e.g. do not enter your email address correctly), you will not be able to access or complete the homework assignments. *The Student Section Code you need to enter when registering 8FF-F9-BBB.* You will be allowed to attempt each assignment ten times; the highest of your scores will be recorded. You will be able to access each HW assignment on the Monday of each week (i.e. you will have access to HW 2 after class on 9/14; HW 1 is already available). Assignments will be accepted until 11 am on the due date (or the beginning of lecture if the assignment is not given in ARIS); late assignments will not be accepted under any circumstances.

#### **Lecture Notes**

I will be using Powerpoint in class and will provide student versions of each set of notes. These available notes have key points missing as I believe that seeing and writing key information will help you retain material better. Powerpoint slides will be posted to Moodle. You are required to take your own notes. If you desire, I will examine your notes *once* during my office hours to give you tips or ideas. If you miss class, it is your responsibility to fill in missing information; I will not post or provide any notes (other than those discussed above) or problems worked out.

#### **Math**

Math will be an essential tool for this class. In particular, algebra, logarithms/antilogs and working with graphs will be important at various times. Keep in mind that if you have to learn both math and chemistry at the same time, both will seem more difficult. It will therefore benefit you to have a realistic appraisal of your skills in these areas, and if necessary to practice and/or get help with any math topics you might struggle with (before you need them for this class). I will be more than happy to help outside of class if you would like, but there will not be time to cover math topics in lecture.

Keep in mind that math is far more than plugging numbers into a calculator. Mathematical equations are the common language that scientists use to express scientific concepts. I will often present new mathematical concepts in class with example problems

which do not require calculators at all to solve; after all, the problem solving process, not the numbers specific to one particular problem, is what's important.

### **General Expectations**

1) **I will try to treat every student with respect.** In return, I expect each student to treat me and all of his/her fellow students with respect. This includes not talking during lecture or when others are speaking. For my part, I will start and finish class on time.

2) **All mobile devices are to be turned off during lecture.** There is nothing more distracting than a phone ringing during class or a nearby person constantly text messaging. All devices should be turned **off**, not just set to silent or vibrate.

3) **I expect you to be honest**, as per the personal code of conduct each GAC student is required to sign when registering for classes (see summary of this code below). I am okay with working on labs and/or homework assignments in groups—in fact, I strongly encourage it. However, there is a vast difference between working as a group and one or two people doing all of the work for a group. When doing group work, everyone in the group should contribute and understand any problem(s) being discussed; when doing lab work, each person should use his/her own data. If you have any questions/concerns about the propriety of a particular aspect of working with your fellow students, please do not hesitate to discuss it with me.

**Academic dishonesty will not be tolerated under any circumstances.** Anyone caught cheating will receive an automatic grade of zero for the assignment/lab/quiz/exam in question, and that score can not be dropped. A second offence will result in the student's immediate removal from the course with an automatic F grade.

4) **Calculators:** You will need a scientific calculator to complete homework and lab assignments. In my experience, students are often unfamiliar with their calculators (especially the more powerful graphing calculators). If that is the case, and you would like some help ask me or your peer mentor for help during office hours. Also, storing information in a graphing calculator for the purpose of using it on a quiz or exam is no different than bringing a crib sheet to class, and therefore constitutes academic dishonesty. I reserve the right to check calculators for such stored information; if I find you have used your calculator in this way, I will immediately (and permanently) confiscate your calculator and you will receive a 0 for the quiz or exam in question.

5) **If you ever have questions, ask!** Ask me about anything! If I can not answer them myself, I will try to point you to someone who can.

### *Gustavus Honor Code:*

Gustavus has adopted an honor code. Each of you is required to abide by the following pledge: "As a community of scholars, the faculty and students of Gustavus Adolphus College have formulated an academic honesty policy and honor code system, which is printed in the Academic Bulletin and in the Gustavus Guide. As a student at Gustavus Adolphus College I agree to uphold the honor code. This means that I will abide by the academic honesty policy, and abide by decisions of the joint student/faculty Honor Board." Pledge: "On my honor, I pledge that I have not given, received, or tolerated others use of unauthorized aid in completing this work." The penalty for not adhering to the honor code will range from taking a zero on the particular piece of work in question to referral to the honor board depending on the circumstances.

### **Tips for Success**

- 1) **Do not wait until the night before a quiz or exam to study.** We will be covering a large amount of material, and it will be increasingly hard to catch up if you fall behind. Chemistry is *much* easier to learn a bit at a time, because it continually builds on itself. The course may seem easy at the beginning if you have had chemistry before; however, this class builds quickly so I recommend starting with good study habits.
- 2) **Keep up with the reading, homework, and lab.** To succeed in this class, it is essential to come to class and lab, keep up with the reading and the homework and to really, *honestly* work through all the problems on your own. Following along in class as problems are worked is not enough. The even-numbered problems in the chapter can be another good source of practice problems!
- 2) **Do the homework.** The homework assignments are meant to help you keep pace with the lecture material and avoid falling behind. In addition, doing the homework should be a reliable way of boosting your course grade.
- 3) **When reading the textbook, re-read any passages which you do not understand.** If you see a word you do not know, look it up in a dictionary. It can also be very helpful to write a summary of material you have just finished reading.
- 4) **Take good notes.** Your notes should be your primary resource when studying for an exam. Your peer mentoring groups will provide you tips and ideas on how to take good notes, and I am willing to read through your notes *once* to provide additional tips/advice. Note that I will not test you on any material which I do not cover in lecture.
- 5) **Learn who your classmates are and form study groups.** Science is often best learned and done in groups, not by individuals. Again, your peer mentoring groups will provide tips for forming and studying with a group of people. You may choose to use the peer mentor groups as your study group, but they will most likely have different instructors than you do, so you may find it more beneficial to work with your classmates.
- 6) **Remember: the amount of chemistry a student learns usually depends on the amount of *quality* time he/she spends trying to learn it!**
- 7) **IF YOU DON'T KNOW SOMETHING, ASK!!!!** Most chemistry students encounter difficulties with the course material from time to time, even those who have earned an A in their high school chemistry class. Ask questions in class! If you have a question, it is likely that someone else in the class has the same question and will be grateful that you asked. I am also happy to spend time with you outside of class to make sure you understand the course material.

### **Additional Resources:**

There are chemistry tutors who meet Sunday-Thursday nights in Nobel 305.

I will post lots of things on Moodle over the course of the semester. If you are looking for an item (a handout, answers to suggested problems, etc.), try looking there. If you still can not find what you need, let me know and I will try to help.

If you have a learning (or other) disability which could affect your performance in this course, please see Laurie Bickett (x6286 or lbickett@gustavus.edu) in the Academic Advising Center. She will work with you to determine any accommodations which might benefit you, and I will be more than happy to implement them.

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
9/7	9/8	9/9 Introduction/Ch 1	9/10 Ch 1	9/11 Ch 1	9/12 <b>HWK 1 Due</b>
9/14 Ch 2	9/15	9/16 Ch 2	9/17 Ch 2	9/18 <i>Quiz 1: Ch 1/2</i> Ch 3.1-3.4, 3.7	9/19 <b>HWK 2 Due</b>
9/21 Ch 3.5-3.7	9/22 Opt. Exam Review	9/23 <b>Exam 1: Ch 1, 2, 3.1-3.7</b>	9/24 Ch 4.1-4.4	9/25 3.8-3.10	9/26 <b>HWK 3 Due</b>
9/28 Ch 4.5-4.6, 13.3	9/29	9/30 Ch 4.5-4.6, 13.3	10/1 Ch 5	10/2 <i>Quiz 2: 3.8-10</i> Ch 5	10/3 <b>HWK 4 Due</b>
10/5 Ch 6, 18.1-18.5	10/6	10/7 <b>Nobel Conference</b>	10/8 Ch 6, 18.1-18.5	10/9 Ch 6, 18.1-18.5	10/10 <b>HWK 5 Due</b>
10/12 Ch 6, 18.1-18.5	10/13 Opt. Exam Review	10/14 <b>Exam 2: Ch 3-6, 18</b>	10/15 Ch 7	10/16 Ch 7	10/17 <b>HWK 6 Due</b>
10/19 Ch 7	10/20	10/21 Ch 8	10/22 Ch 8	10/23 <i>Quiz 3 Ch 7/8</i> Ch 8	10/24 <b>HWK 7 Due</b>
10/26 <b>Reading Day</b>	10/27	10/28 Ch 9	10/29 Ch 9	10/30 Ch 9	10/31 <b>HWK 8 Due</b>
11/2 Ch 10	11/3 Opt. Exam Review	11/4 <b>Exam 3: Ch 7-9</b>	11/5 Ch 10	11/6 Ch 10	11/7 <b>HWK 9 Due</b>
11/9 Ch 12	11/10	11/11 Ch 12	11/12 Ch 13	11/13 <i>Quiz 4</i> Ch 13, Ch 15	11/14 <b>HWK 10 Due</b>
11/16 Ch 15, Ch 18.6	11/17	11/18 Ch 15, Ch 18.6	11/19 Ch 15, Ch 18.6	11/20 Ch 15, Review	11/21 <b>HWK 11 Due</b>
11/23 <b>Exam 4: Ch 10, 12, 13, 15, 18.6</b>	11/24	11/25-11/28 <b>Thanksgiving Break</b>			
11/30 Ch 16	12/1	12/2 Ch 16	12/3 Ch 16	12/4 Ch 17	12/5
12/7 Ch 17	12/8 Opt. Exam Review (Ch 16-17) <b>HWK 12 Due</b>	12/9 Ch 14	12/10 Ch 14	12/11 <b>Exam V: Ch 16, 17, 14</b>	
12/14 Final Review	<b>Final Exam: Saturday Dec 19, 3:30-5:30 in our classroom</b>				

