

## **Syllabus**

CHE 107

Principles of Chemistry

Fall Semester 2012

Section 05

MTWF 1:30 – 2:20 PM

201 Nobel Hall

## **Lecturer**

Dr. Aron Anderson

**office:** 209 Nobel Hall (Office hours: T: 10:30-11:30, W: 11:30-12:30; other times available by appointment...call or e-mail me)

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**Required Textbook:** *General Chemistry* by Don McQuarrie, Peter Rock, and Ethan Gallogly (Fourth Edition) University Science Books, 2011. ISBN: 978-1-891389-60-3

**Required Lab Text:** *Principles of Chemistry: CHE 107 Laboratory Experiments Fall 2012*

**Other Paraphernalia:** Safety goggles (required); a bound laboratory notebook with duplicate page functionality (required).

**Course web page on Moodle:** <https://moodle.gac.edu/course/view.php?id=479166>

**Sapling homework site:** <http://www.saplinglearning.com/ibiscms/course/view.php?id=10839>

**Course Overview:** *Principles of Chemistry* is an introductory chemistry course. This course provides a basic understanding of key chemistry principles for both the 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, but also aims to prepare students for upper-level chemistry and biology coursework. The laboratory work is intended to illustrate principles learned in lecture and to develop your experimental skill, while introducing you to the major subdisciplines in chemistry.

## **Examinations**

There will be five (5) midterm exams and one (1) final exam. Unfortunately, there will be no makeup exams, except in the case of approved college activities or extraordinary illness or injury. Personal notes are not allowed to be used during examinations. Calculators may be used on exams; make sure your calculator can do logarithms, exponents, and scientific notation. The midterm exams together will count for **50%** of the final grade. The final exam is cumulative for the entire course and will count for **20%** of the final grade.

## **Homework**

**Textbook Problems.** You must do a significant quantity of homework problems to do well in this class. When you are reading the book and encounter the practice and example problems within the chapters, you should stop and take the time to work through them. Also, homework problems from the textbook will be recommended for each chapter. Textbook homework will not be collected or graded, but you will be expected to understand the concepts and be able to demonstrate the capability to solve similar problems on the exams. Indeed, completion of practice problems and homework problems is critical for satisfactory performance on the midterms and the final exam. You are encouraged to complete extra problems beyond those recommended. Please don't underestimate the importance of this.

**Sapling Homework System.** You will be responsible for completing the online homework on the Sapling System, as it will be part of your course grade. Problem sets will be due approximately weekly. Each homework set will have a due date/time by which the set must be completed to receive points. The link for this homework is provided above and will also be available on the course Moodle site. Sign-up instructions are posted on Moodle also. The Sapling Homework scores will constitute **10%** of the final grade.

## **Grading**

The points for the course will be captured as follows. The midterm exams will be worth 100 points each for a total of 500 and the comprehensive final exam will be worth 200 points. The labs and lab reports will account for 200 points (and **20%** of the final grade). Completion of the laboratory curriculum is essential for understanding chemistry, thus, attendance at **all** labs is **mandatory** (One missed lab = failure for the course). The homework will be worth 100 points. This gives a total of 1000 points which are possible for the entire course.

<b>Coursework</b>	<b>Contribution to course grade</b>
Midterm Exams (5)	50%
Sapling Homework	10%
Lab	20%
Final Exam	20%

To earn the following grades, you must achieve the total minimum percentages noted here:

<b>Grade</b>	<b>Minimum percent of points</b>
A-	88%
B-	75%
C-	63%
D	54%

This table is provided to allow you to estimate your performance as the semester progresses. The precise final grades will be determined based on the distribution of scores at the end of the semester.

## Lecture Schedule (approximate trajectory)

We will plan to cover information from the first 23 chapters of the textbook (!). This may seem like a near impossible feat (since we need to cover about 2 chapters per week), but we will not cover all material in every chapter, nor will we cover all topics to equal depths. Attendance in class is important for tracking the topics and concepts that are important to learn/know.

Dates	Topic	Book Chapters
Sep 4-7	Introduction; Scientific Method; Atoms	1, 2
Sep 10-14	Periodic Table; Early Quantum Theory	3, 4
Sep 17-18	Not so early Quantum Theory; Review	5
Sep 19	<b>Midterm Exam 1 (Chapters 1, 2, 3, 4, 5)</b>	
Sep 21	Ionic Bonds and Compounds	6
Sep 24-28	Ionic Compounds; Lewis Formulas; Geometries	6, 7, 8
Oct 1	Geometries; Covalent Bonds	8, 9
Oct 2-3	Nobel Conference.....No Classes	
Oct 5	Covalent Bonds	9
Oct 8-9	Covalent Bonds; Review	9
Oct 10	<b>Midterm Exam 2 (Chapters 6, 7, 8, 9)</b>	
Oct 12	Chemical Reactivity	10
Oct 15-19	Chemical Reactivity; Thermochemistry	10, 14
Oct 22-23	Reading Days.....No Classes	
Oct 24-26	Thermochemistry; Chemical Thermodynamics	14, 23
Oct 29-30	Chemical Thermodynamics; Review	23
Oct 31	<b>Midterm Exam 3 (Chapters 10, 14, 23)</b>	
Nov 2	Moles, Chemical Formulas, Stoichiometry	11
Nov 5-9	Stoichiometry; Solution Reactions; Gases	11, 12, 13
Nov 12-16	Gases, Liquids, Solids; Colligative Properties	13, 15, 16
Nov 19	Colligative Properties; Review	16
Nov 20	<b>Midterm Exam 4 (Chapters 11, 12, 13, 15, 16)</b>	
Nov 21-25	Thanksgiving Break.....No Classes	
Nov 26-30	Chemical Kinetics; Rate Laws; Mechanisms	17, 18
Dec 3-7	Equilibrium; Acids and Bases; Buffers; Titration	19, 20, 21
Dec 10-11	Solubility; Precipitation; Review	21, 22
Dec 12	<b>Midterm Exam 5 (Chap. 17, 18, 19, 20, 21, 22)</b>	
Dec 14	Review for final exam	
<b>Dec 17</b>	<b>Final Exam: Monday, Dec 17, 10:30-12:30 in Nobel 201</b>	

[Note: The Lab Schedule will be described in the individual laboratory sections.]

### Academic Honesty

Don't cheat, OK. The honor code and the college's policies on cheating and plagiarism are described elsewhere and will be upheld in this class. Homework and Lab Reports you submit should be based primarily on your personal effort, with any collaborative discussion you have with other students focused on concepts and methods. You should not copy anyone else's

work. This may seem like an easy solution to your busy class schedule or your interest in other subjects (such as: Minecraft), but cheating at this point in your career only leads to the development of undesirable habits (such as: taking credit for other people's accomplishments) and illegal behaviors (think: Bernie Madoff-inspired Ponzi schemes). Would you want to go to the neurosurgeon who cheated their way through General Chemistry (or their medical school classes)?

Full descriptions of the Academic Honesty Policy and the Honor Code can be found in the catalogue on the web at: [https://gustavus.edu/general\\_catalog/current/acainfo](https://gustavus.edu/general_catalog/current/acainfo)

## **Chemistry Tutors**

Chemistry tutors are available Sunday through Thursday evenings, 7:00–10:00 PM in Room 305 Nobel Hall. There will also be chemistry tutors in some of the residence halls. The tutors will be quite helpful in addressing your questions about Gibbs Energy, stoichiometry, valence electrons, and other details of the course.

## **Peer Mentoring Program**

To help you develop stronger learning skills and to better understand the ethos of scientific inquiry you will be participating in a Peer Mentoring program during the semester. This program is funded by the college. The goal of this program is to help you be more successful in biology and chemistry, as well as other scientific courses.

Each week, you will meet with a small group of peers also enrolled in BIO101 and/or CHE107. The sessions are led by a junior or senior majoring in biology, chemistry, or biochemistry. The sessions involve activities where you will practice application and synthesis of concepts, and gain an enhanced understanding of the subjects. There are three main types of activities:

- Lecture and Laboratory content reinforcement and practice
- Skill building
- How to think and act like a scientist

You are required to **sign up** for a peer-mentoring group in **121 Nobel Hall on Wednesday, Sep. 4 or Thursday, Sep. 5 between 5:00 - 9:00 pm**. If you are enrolled in either BIO 101 or CHE 107, 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 covers activities for both courses. Please bring your class and event schedule with you when you sign up for a Peer Mentoring group to help determine which time will work best for you. Peer Mentors will be available at that time to answer your questions.

You will meet with your group once a week in Nobel 121 or Nobel 106B. Bring a notebook and a pen or pencil to your session, and possibly a textbook. You will not be allowed to use personal electronic devices (such as phones, smartphones, flip-phones, dumb-phones, iPods, iPads, Tomagotchis,...) during your peer mentoring session. Ten sessions are planned for the weeks of: Sep: 9, 16, 23; Oct: 7, 14, 28; Nov 4, 11, 25; and Dec. 4. There will be no sessions during Nobel Conference Week, Reading Week, or Thanksgiving week. A list of the Peer Mentoring activities for the semester is on Moodle. If you do not attend *and actively participate* in eight (8) of the ten (10) peer mentoring sessions, **you will lose 5%** of your final course points. If you have any questions, please contact Scott Bur or Aron Anderson, Peer Mentoring Coordinators at [sbur@gustavus.edu](mailto:sbur@gustavus.edu) or [aander16@gustavus.edu](mailto:aander16@gustavus.edu).

## **Disability Services**

Gustavus Adolphus College is committed to ensuring the full participation of all students in its programs. If you have a documented disability (or you think you may have a disability of any nature) and, as a result, need reasonable academic accommodation to participate in class, take tests or benefit from the College's services, then you should speak with the Disability Services Coordinator, for a confidential discussion of your needs and appropriate plans. Course requirements cannot be waived, but reasonable accommodations may be provided based on disability documentation and course outcomes. Accommodations cannot be made retroactively; therefore, to maximize your academic success at Gustavus, please contact Disability Services as early as possible. Disability Services (<https://gustavus.edu/advising/disability/>) is located in the Advising and Counseling Center.

## **Help for Students Whose First Language is not English**

Support for English Language Learners (ELL) and Multilingual students is available via the College's ELL Support staff person, Andrew Grace ([agrace@gustavus.edu](mailto:agrace@gustavus.edu) or x7395). He can meet with individual students for tutoring in writing, consulting about academic tasks, and helping them connect with the College's support systems. The ELL Support person can also consult with faculty members who have ELL and multilingual students enrolled in their classes. The College's ELL staff person can provide students with a letter to a professor that explains and supports academic accommodations (i.e. additional time on tests, additional revisions for papers). Professors make decisions based on those recommendations at their own discretion. In addition, ELL and multilingual students can seek help from peer tutors in the Writing Center.