CHE 107-003: Principles of Chemistry

M,W,Th,F 11:30-12:20 in Nobel 201
Course Syllabus, Fall 2008

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Office Hours: W, Th 1:30 - 3:20 pm

Required Text and Materials

- Chang, R. General Chemistry: The Essential Concepts, McGraw Hill, 5th ed.
- Laboratory Manual, Safety Glasses/Goggles: Available from the Bookmark
- Close-toed shoes are required for lab!!
- Scientific Calculator: Required for everyone, need not be expensive - must be able to do logarithms and exponentials. Cell phone calculators are not allowed and memories may be wiped on programmable calculators.

Online Resources

Course website: http://moodle.gac.edu - Announcements, handouts, blogs, practice materials
Text/homework website: http://www.mhhe.com/chang (click on 5th edition)

Course Description

Chemistry is the "central" physical science and happens within us and around us every minute of every day. Chemicals and chemical processes are at the heart of agriculture, the food industry, cosmetics, computers, construction materials, pollution, energy, biology, the environment… essentially everything. As such, all people are "consumers of chemistry" and a basic understanding of this central science is required to intelligently navigate the world around us, from interpreting labels at the grocery store to understanding the root issues behind political and legal battles over wastes and resources.

Principles of Chemistry is a one-semester introductory course that surveys the many sub-disciplines of chemistry, serves as a building block for future chemistry courses, and is the primary forum for disseminating basic chemical knowledge to all consumers of chemistry. As such, this course introduces a large amount of material in a short period of time. ***It is essential that you keep up on your reading, problem sets, and laboratory exercises to succeed in this course!*** Readings should be done prior to covering the material in class and assignments are due by the date and time specified.

As a physical science, laboratory work is essential to make progress and observe the sometimes abstract concepts of chemistry "in action". The lecture and laboratory components of this course are complementary and you must pass both portions to receive a passing grade. Thus, even though the lab component counts 20% of your grade, if you fail this portion or don't complete all labs you will receive a grade of "F". ***It is essential that you attend all laboratory sessions***. Attendance at lectures is not required, but is strongly encouraged and necessary to achieve an "A", as I will be covering some topics in lecture that are NOT covered in your text. Be forewarned that failure to attend a scheduled meeting is unprofessional behavior (see below) and that poor attendance will be considered when I decide grades in borderline situations.

Budding Professionals

Each of you attends Gustavus Adolphus to prepare for a professional career in some discipline. In every job, problem solving and communication skills are essential, as is professionalism. We will develop all three of these attributes in this course as much as possible. I expect all of you to act like young professionals. Some aspects of professional conduct include (i) abiding by the academic honesty guidelines set forth by Gustavus Adolphus and (ii) respecting your colleagues, which include yourself, your classmates, and your instructor(s) at all times. Part of respecting your colleagues includes ***turning off your cell phones before lecture begins***, just as you would at an important meeting. Also, neatness and spelling will count on quizzes, exams, and other assignments because they are ***required*** to be successful in the academic and business worlds.

My Teaching Philosophy

So that you understand what motivates my lecture, homework, and exam content and style, I have included a brief summary of my teaching philosophy below. If you are interested in learning more about teaching and learning styles, I will be happy to recommend and/or provide some appropriate literature.

> I believe the chemistry educator should (i) provide future consumers of chemistry the tools they need to form educated opinions on current and future chemically-oriented issues, (ii) inspire young people to follow a career path in chemistry, (iii) involve themselves in the study of chemistry pedagogy and integrate promising new techniques in the classroom, and (iv) provide young chemists with the tools to succeed in an interdisciplinary community. The most important of these tools for the aspiring young professional (chemists and all other vocations) are problem solving skills and an ability to communicate effectively with professional and lay audiences. One way problem-solving skills are instilled in students is by answering student questions with questions. In my experience, students have always proven capable of answering their own questions when the instructor provides appropriate scaffolding for the student's individual needs and level of understanding, a technique that is well established in the education community. This approach facilitates effective learning because the student is making connections and conclusions rather than the instructor dictating methods or answers. I believe in teaching students a problem-solving strategy from their earliest exposure to chemistry and providing the opportunity to practice the strategy by incorporating at least one challenging, loosely-framed conceptual question on all homework assignments and each examination. Because all students at the collegiate level are expected to read their texts, I believe it is the job of a lecturer to supplement and augment the text as well as emphasize and clarify complicated text material rather than recounting or summarizing the entire textbook in lecture form. These approaches have proven effective for developing problem solving skills and teaching concepts in my educational background and represent the foundation of my teaching style.

Grading

Quizzes (5)	50 %	A	>94%
Final	20 %	A-	90-93
Laboratory	20 %	B+	87-90
Homework	10 %	B	83-87
		B-	80-83
		C+	77-80
		C	73-77
		C-	70-73
		D	60-69
		F	<60

The percentiles required to achieve a certain grade in this course are not fixed; the scale provided above is for general information purposes and tells you that you need at least a 94% to guarantee an A. I reserve the right to adjust the percent required for each grade ***DOWN***, but will not adjust these ranges up (e.g. for the final grade, you may only need 85% for a B+ and are guaranteed a B+ if you average 87% in the course).

Quizzes

You will take five full period quizzes in lecture that each count as 10% of your final grade. The quiz dates and tentative topics are listed below this paragraph. Any adjustment to the quiz topics will be announced in class on the Monday prior to the quiz date. Quizzes may include a combination of multiple choice, short answer, and/or problem solving questions. Sharing calculators will not be permitted and spares may not be available…bring your calculator on quiz days! Make-up quizzes will only be allowed by ***prior arrangement*** and for legitimate reasons (illness, family emergency, College-sanctioned sporting event) and will differ from the quiz taken during the lecture period. Missed quizzes result in a score of zero.

Quiz 1 Sep 19:	Chapters 1-3
Quiz 2 Oct 10:	Chapters 4-7
Quiz 3 Oct 31:	Chapters 8-10, 21
Quiz 4 Nov 17:	Chapters 12-14
Quiz 5 Dec 10:	Chapters 15-17

The Laboratory

There is no laboratory scheduled the first week of class. Your lab booklet contains a complete laboratory schedule for the semester on pages 2 and 3. There is a set of pre-lab questions that are due at the beginning of your laboratory section for each experiment, ***including questions for experiment 1 that will be due next week***. Please report to the appropriate meeting room (listed on the first page of your lab manual) for a lecture on the important concepts in the coming experiment and/or a pre-lab quiz every week. Be sure to dress appropriately (no open-toed footwear, exposed midriffs) and bring your lab manual, lab notebook, and safety eyewear to each laboratory session. ***Laboratory attendance in your regularly scheduled section is mandatory***. If there is a good reason that you cannot attend your regularly scheduled laboratory section, you should fill out the "Make-up Lab Request Form" available on the course Moodle site and email the completed form to Dr. Bowers at gbowers@gustavus.edu. Detailed instructions regarding make-up lab procedures can (and should) be viewed in the "Lab Attendance Policy" file on the course Moodle site.

Homework Assignments

Homework assignments in this course will have two parts. One will involve a series of online problems using the ARIS online homework system, accessible at http://www.mhhe.com/chang (click on the 5th Edition). The key code required to access the assignments for our section is on the course Moodle site in a word document along with instructions for registering with ARIS and info regarding the ARIS tools available to you as students. Students are STRONGLY encouraged to work out their problems on paper showing all work and using an appropriate problem-solving strategy for two reasons. First, if you have questions, the first thing I will ask is to see your written work so that I can help identify where you may have made a mistake and help you avoid similar mistakes in the future. Second, you will need to show all your work and use a step-by-step approach to earn full and partial credit on quizzes and the final exam, and doing this on your homework is good practice. Each assignment will also involve a question from your text designed to challenge you and develop problem-solving skills. This problem will be in short-answer format and will be submitted on paper in class (neatness will count, budding professionals!). Homework assignment due dates will be announced in class and posted to the course Moodle page; reminders will also appear with my announcements written on the

blackboard each period. Late homework is not accepted and extensions will only be granted in cases of major server errors or other unusual circumstances at the discretion of your instructor.

Tutoring

It is not uncommon for students to have difficulty with some of the concepts in this course. You will have to be focused and disciplined throughout the semester to keep up with this material. Upper-level chemistry majors are available to tutor most evenings in Nobel 305. A schedule will be posted early in the semester. I am also available to answer your questions during office hours (W, Th 1:30 - 3:20 pm) and other times by appointment. You are welcome to stop by my office any time with a question, but outside these hours and without a specific appointment I may have other commitments that cannot be avoided.

Academic Honesty

Every student is required to sign the honor code on each quiz. Gustavus Adolphus College is proud to operate under an honor system. The faculty and students have jointly created an Honor Board to enforce this policy. Please see the academic catalog for full details of the academic honesty policy. Depending on the severity of the violation, in this class you will generally receive a zero for the first academic honesty violation and fail the course for a second violation. It is Gustavus Adolphus policy that academic honesty violations are reported to the Dean's office. Homework assignments are exempt from the academic honesty policy in this course and you are encouraged to work together on homework assignments (but do your own work and make sure you understand the concepts!!!).

Disability Services

Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act (1990) work together to ensure 'reasonable accommodation' and non-discrimination for students with disabilities in higher education. A student who has a physical, psychiatric/emotional, medical, learning, or attentional disability that may have an effect on the student's ability to complete assigned course work should contact the Disability Services Coordinator in the Advising Center, who will review the concerns and decide with the student what accommodations are necessary.

Tentative Lecture Topics by Date

SEPTEMBER				
Monday	Tuesday	Wednesday	Thursday	Friday
1	2	3 Course Overview, Chapter 1	4 Chapter 1	5 Chapter 2
8 Chapter 2	9	10 Chapter 2	11 Chapter 3	12 Chapter3
15 Chapter 3	16	17 Chapter 4	18 Chapter 4	19 **Quiz, Chp 1 - 3**
22 Chapter 4	23	24 Chapter 5	25 Chapter 5	26 Chapter 5
29 Chapter 6	30	1 Chapter 6	2 Chapter 7	3 Chapter 7

OCTOBER				
Monday	Tuesday	Wednesday	Thursday	Friday
29 Chapter 6	30	1 Chapter 6	2 Chapter 7	3 Chapter 7
6 Chapter 7	7 Nobel Conference	8 Nobel Conference	9 Chapter 8	10 **Quiz, Chp 4 - 7**
13 Chapter 8	14	15 Chapter 21	16 Chapter 21	17 No Lecture: Midterms
20 Reading Break	21 Reading Break	22 Chapter 9	23 Chapter 9	24 Chapter 9
27 Chapter 9	28	29 Chapter 10	30 Chapter 10	31 **Quiz, Chp 8-10, 21**

NOVEMBER				
Monday	Tuesday	Wednesday	Thursday	Friday
3 Chapter 10	4	5 Chapter 12	6 Chapter 12	7 Chapter 13
10 Chapter 13	11	12 Chapter 14	13 Chapter 14	14 Chapter 14
17 **Quiz, Chp 12 - 14**	18	19 Chapter 18	20 Chapter 18	21 Chapter 18
24 Chapter 15	25	26 No Lab: Thanksgiving	27 No Lab: Thanksgiving	28

DECEMBER				
Monday	Tuesday	Wednesday	Thursday	Friday
1 Chapter 15	2	3 Chapter 16	4 Chapter 16	5 Chapter 16
8 Chapter 16	9	10 **Quiz, Chp 15 - 16**	11 Chapter 17	12 Chapter 17
15 Final Exams	16 Final Exams	17 Final Exams	18 Final Exams	19