

## Chemistry 125, Section B, MWF 9:05-10:00 AM

St. Olaf College, Fall 2002

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Office hours: M 1:00-2:00 PM  
T 10:00-11:00 AM, 4:00-5:00 PM  
F 10:30 AM-12:00 PM  
or by appointment

Materials you will need:

*Chemistry, The Molecular Nature of Matter and Change* 3<sup>rd</sup> edition, Martin Silberberg

Chemistry 125 2002 Laboratory Manual and safety goggles  
(lab begins Monday September 9<sup>th</sup>)

### Course description:

There are numerous ways to describe the subject of chemistry. Some see an environmental aspect, the study of pollutants on an eco system. Other may see a medical aspect, the long term effects chemotherapy in cancer patients. Regardless of the definition, chemistry involves the study of the submicroscopic properties and behaviors of matter and the macroscopic observations of these behaviors. In this course we will begin to define some of the many relationships between atoms and molecules and how they interact in ordinary and sometimes extraordinary ways. Just like chemistry itself, the course will provide the analytical tools necessary to participate in a wide variety of scientific disciplines.

### Course objectives:

Chemistry is a bit like learning a foreign language. Before we can travel and indulge in the sights sounds and experiences of a new land, we must first learn to communicate. This will involve learning a lot of new facts, some of which may seem a little obscure, but remember we are building communication skills in addition to learning specific items.

The goals of this course are defined on several levels. The department seeks to offer a “welcome mat”, recruit new majors and provide a foundation for later courses. My goals are to foster your further interest and learning of the sciences and to provide a basic set of concepts and skills necessary to support this interest. It is also my goal to present information in the context of “the big picture” so we can gain an appreciation of the complexity and breadth that is chemistry. Your individual goals are very important to me and how I approach the course. A day one discussion will help us frame the course to meet those goals.

## **Class policies and philosophies:**

Attendance. I will be covering certain topics that are not in the text and this information will only be available via lecture. It is in your best interest to attend every class and “pop” quizzes will be given to insure good attendance.

If you know you will be unable to attend class due to athletics, concert tour or other sanctioned event please makes arrangements with me ahead of time. Sudden illness and emergencies should be communicated directly with me or via the Dean’s office.

College policy states you must take the final exam at its scheduled time (December 18<sup>th</sup>, 9-11:00 AM). Plan ahead.

Homework. I will be assigning problems to challenge your mastery of the material. Please take these exercises seriously, simple completing the assignment may not insure your proficiency. Check your answers against those on reserve in the library. Things to insure you will get maximum credit for your work:

- 1) Neatness counts! Loose leaf paper, single staple in the upper left-hand corner.
- 2) Circle your answer
- 3) Show all your work, if you get stuck at the end of a page, don’t re-write the entire page, a single line through the incorrect part will suffice
- 4) On time, on time, on time. Homework is due at the beginning of class, late work will not be accepted.

The grader will assign 0-3 points to the work based on the following criteria:

- 3 pts. Excellent work, nearly everything correct including the proper use of significant figures and labels.
- 2 pts. Good work, some errors, docked for neatness, significant figures or units
- 1 pt. Fair work, incomplete assignment or work not shown
- 0 pts. Late or too messy to decipher

Class Participation. Please come to class having reviewed the material for the day and prepared to participate. I would love to spend the period answering questions and moderating a discussion rather than lecturing. If you have a unique insight I will invite you to share it with the class. Please note there will be zero tolerance of any actions (verbal or non-verbal) that belittle each other, you or me.

Assessment tools. In a given classroom there are students with different learning styles. These “multiple intelligences” makes it difficult for a given presentation style to reach everyone equally. Because of this, I will be employing different assessment tools to determine if I am communicating effectively and if you are mastering the material. For you the assessment tools will be common (quizzes, tests and discussions). For me, I will be asking you for input, asking you to grade me. One tool will be an exercise called QuKeS.

QuKeS: On a sheet of paper write down one thing you would like me to Quit doing, one thing you would like me to KeeP doing and one thing you would like me to Start doing. QuKeS can be brutally honest and anonymous or complementary and signed. You will never be graded or judged on your QuKeS. I may ask for these daily or weekly, or feel free to send one anytime through e-mail, campus mail or carrier pigeon.

One of the most important aspects of teaching is gathering feedback from students. If I am not communicating effectively, then I am not teaching. Periodically I will be asking for formal feedback from you, but at anytime you feel I am unclear, bring this to my attention. I definitely have the attitude that we

can work together as a team to better understand chemistry. I welcome and encourage participation in and outside of class. Remember the old adage, “you get out of it what you put into it”.

The exams will challenge your mastery of the facts as well as an ability to “think outside the box”. Be prepared to derive, synthesize and evaluate new situations.

I will have an open door policy as much as possible so please drop in. Also, I will be using the course website to convey information, post solutions, give hints and tips and provide links to additional resources. Please use this and e-mail as a primary resource.

### Grading and Course Requirements

The course will consist of four exams and one comprehensive final exam. There will also be homework and laboratory exercises as part of the grade. The point structure follows:

Exams 4 @ 100 points each	400
Homework	100
Laboratory	150
Final	
Most recent unit	130
Comprehensive portion	120 (roughly 30 pts. From each unit)
Total	900

The following percentages are a guideline for grade assignment:

- A 100-85%
- B 84-75%
- C 74-60%
- D 59-50%

The following are the minimum requirements that must be met to obtain a passing grade:

- Earning 55% or more on one of the first two unit exams
- Turning in one time at least 80% of the homework assignments
- Earning at least 70% of the laboratory points
- Earning at least 45% of the final exam points

Failure to meet any two of the minimum requirements will result in a grade of “F” even if the total points earned for the semester are above the “F” range.

### Chemistry 125 Course Schedule (subject to change)

Class Date	Topic	Reading	Assigned problems
F 9/6	Intro to chemistry		
M 9/9	Foundations	Chapter 1	1: 4,5,16,17,22,23,24,25,38,46,48
W 9/11	Atomic view of matter	Chapter 2	1: 58, 73, 80, 81, 82, 84, 87
F 9/13	Ions, molecules and nomenclature		2: 27,34,35,37,40,41,45,50,53,54,56,57
M 9/16	Mass and mole relationships	Chapter 3	2: 58,59,67,79,80,81,83,88,97,103,128
W 9/18	Using balanced equations		3:2,10,12,16,25,29,36,41,44
F 9/20	Solution stoichiometry		3:52,64,66,71,79,93,95,104,111,122
<b>Monday 9/23 Exam 1</b>			
W 9/25	Aqueous systems	Chapter 4	TBA (to be announced)
F 9/27	Aqueous systems		
M 9/30	Gases	Chapter 5	TBA
W 10/2	Gases		
F 10/4	Bohr model of the atom	Chapter 7	TBA

M 10/7	Wave behavior of matter		
W 10/9	Atomic orbitals		
F 10/11	Effective nuclear charge	Chapter 8	TBA
<b>Monday 10/14 Exam 2</b>			
W 10/16	Periodic trends		
F 10/18	Chemical bonding (ionic)	Chapter 9	TBA
W 10/23	Chemical bonding covalent	Chapter 10	TBA
F 10/25	Molecular geometry		
M 10/28	Hybrid orbitals	Chapter 11	TBA
W 10/30	Molecular orbitals		
F 11/1	Molecular orbitals		
<b>Monday 11/4 Exam 3</b>			
W 11/6	Molecular orbitals		
F 11/8	Coordination compounds	Chapter 23	TBA
M 11/11	Coordination compounds		
W 11/13	Coordination compounds		
F 11/15	Equilibrium and Q	Chapter 17	TBA
M 11/18	LeChatelier's principle		
W 11/20	Acid base equilibria	Chapter 18	TBA
F 11/22	Weak acids and bases		
<b>Monday 11/25 Exam 4</b>			
M 12/2	Weak acids and bases		
W 12/4	Buffers	Chapter 19	TBA
F 12/6	Acid base titrations		
M 12/9	Acid-base titrations		
W 12/11	Summary and review		

**Wednesday 12/18 Comprehensive Final Exam 9:00-11:00 AM**