

Welcome to introductory Chemistry 106. The material covered in the Chem 105/106 classes can arguably be considered as some of the most important material if you are planning on continuing in science and perhaps even if you never take another science class. Chemistry is a fundamental foundation for many fields of study because everything is made up of chemicals. This course will prepare you to talk the language and solve problems that form the underlying basics of whatever field you are choosing to base your career. Twenty-three years ago as an undergraduate here at UWSP, I sat in many of the same seats that you are sitting now. Since then, as a materials scientist (cross of physics, chemistry and engineering) most of my best discoveries came directly from material that I learned here in Point in my introductory chemistry class. Certainly more advanced classes helped, but all of them built on the fundamentals. Knowing the basics of chemistry allows you to collaborate with experts of many fields and speak a common language. When reading your professional literature in the next few years, much of it will assume your knowledge of fundamental chemistry and your mastery of the concepts and problem solving skills learned in 105/106. Many of the advanced courses that I took were nothing more than application or further explanations of the fundamentals of this course. No matter what field you are about to choose, learning basic chemistry will make you better as an environmentalist, teacher, nurse, engineer, biologist, parent or citizen. By combining this knowledge with your major studies courses and ideas from carefully chosen general degree requirement classes will be able to think outside of a narrowly focused field. Creativity comes from having a broad range of experiences and ideas. This can help you to creatively solve problems for your future employers making you valuable to them. Thinking and giving them that extra value is what may help you keep your jobs from being outsourced overseas.

My goal in this course is not to make you memorize a list of arcane facts and names of chemicals, but to recognize how chemistry is a broad foundation for so many things in life. Memorization of some facts is necessary, because these facts are the tools which you will use, but rote memorization is not the end goal.

The world is full of things that seem too complex and too difficult to explain. Seeing how the world is assembled from the basic building blocks of matter helps to explain some of this magic. Don't worry, lots of the magic will be left for you to learn, to discover on your own and either to publish or to patent for a profit. Being curious enough to ask "why" when you see something that doesn't make sense and then using chemistry, biology, physics, math, psychology and other tools that you are learning here at UWSP to figure out "why" something either works or doesn't work makes life more fun. CHEM 106 is more fun than 105 because we explore topics in a bit more depth and then apply it to the world around us.

I. Course Description (from the UWSP official course catalog)

CHEM 105. Fundamental Chemistry. 5 cr. (Two semester basic course) Fundamental principles and theories of chemistry, including stoichiometry, atomic and molecular structure and bonding, nuclear chemistry, thermodynamics, descriptive chemistry of nonmetals and transition metals, chemical kinetics and equilibria, introduction to organic chemistry. 3 hrs lec, 1 hr disc, 3 hrs lab per wk. Prereq: Math 90 or placement in 100 or above. (I, II) GDR:NS

CHEM 106. 5 cr. Continuation of 105. 3 hrs lec, 1 hr disc, 3 hrs lab per wk. Prereq: 105, Math 100 or higher. (See notes 1 and 4.) (I, II) GDR:NS

II. Weekly Schedule & Office Hours

Dr. Michael Zach

Fall Semester 2006

	Monday	Tuesday	Wednesday	Thursday	Friday
08:00	106 Lab 8 B140	106 Lab 9 B140			
09:00					
10:00				<i>Class Prep</i>	
11:00	<i>Class Prep</i>	<i>Office</i>	<i>Class Prep</i>	106 Disc 8 A110	<i>Class Prep</i>
12:00	<i>Class Prep</i>		<i>Chem 298</i>	106 Disc 9 A110	<i>Class Prep</i>
13:00	106 Lec 3 A121		106 Lec 3 A121	106 Disc 10 A110	106 Lec 3 A121
14:00		106 Lab 10 B140			meeting seminar
15:00	<i>Office</i>			<i>Office</i>	
16:00					

I urge you to come to my office hours with questions when the material seems confusing. I want to help you achieve your goals for this class. I have an open door policy, so feel free to stop past my office at any time that is free and I am in my office. If you make an appointment, I will be there. **So I may serve the whole class, please respect my class prep times.** Only upon rare occasions and with an appointment will I agree to meet during what is normally a class prep time.

III. Course Objectives

- 1) To help you discover the rules that Nature uses to assemble matter. Those rules reveal relationships that help you to remember facts in a way that makes sense. The facts and rules become tools you can use for solving problems important to you, your employer and society.
- 2) To develop critical thinking skills in chemistry and be able to combine them with other fields of study. Just learning a list of facts is not enough. You must be able to use the concepts and merge them with ideas from other aspects of your life to synthesize new ideas.
- 3) To draw from your past experiences so that you creatively use chemistry in a way that you can contribute to the world. It is not how you perform in this class; it is how you use your unique background that will give each of you an edge in life. Find those unique abilities and apply knowledge of chemistry with it for great success.
- 4) To start speaking the language of chemistry. As professionals you will need to communicate with other professionals. Being able to talk intelligently about fundamentals that provide a basis for so many scientific fields is important. Not learning the “lingo” creates a disadvantage if you can’t communicate with the experts. Remember your roots so that you can always explain your work to others who can’t “speak chem.”
- 5) To improve problem solving skills that can be used in any field of study. If you can solve a tough problem in chemistry, you can apply those same skills to solving tough

problems in any field. It is about training your mind, not just getting the right answer for the test.

6) To develop and improve laboratory skills. Filling in the answer in your lab report should not be your goal; learning the tools so you can solve problems in something other than a “canned lab exercise” is your goal.

7) To enhance awareness of the presence and role of chemistry in the world around us. Continue to be amazed.

8) To meet your fellow classmates and learn to collaborate with others in professional working relationships. I want you to work with your peers and learn as much from each other as you do from me. This is a real life task and a lot of fun when you do it right.

IV. Lecture and Discussion Schedule

The following is an approximate schedule of lecture, lab and exams

Week	Week of	Text Chapters and Exams				Lab & Lecture Activities
		Mon	Wed	Thur Exam	Fri	
1	Jan 22	Intro 106	12		12	Check in and Safety Video
2	Jan 29	12	16		16	Separation of Amino Acids by Paper Chromatography
3	Feb 5	16	19		19	Le Chatelier's Principle
4*	Feb 12*	19	13	*	No class	Quantitative Analysis: Group I
5	Feb 19	13	13		14	Quantitative Analysis: Group II
6	Feb 26	14	14		15	Quantitative Analysis: Group III
7	Mar 5	15	15		17	Quantitative Analysis: General Cation
8	Mar 12	17	17		18	Quantitative Analysis: General Cation (report: 20pts)
X	Mar 19	SPRING BREAK				
9*	Mar 26*	18	18	*	No class	The Decomposition of Crystal Violet
10	Apr 2	22	22		22	Buffers
11	Apr 9	20	20		20	Titration of Diprotic Acid: Identifying an Unknown
12	Apr 16	20	21		21	Solubility & Thermodynamics of Potassium Nitrate
13*	Apr 23*	21	21	*	No class	Electrochemical Cells
14	Apr 30	25	25	25		Synthesis of Aspirin
15	May 7	25	review		TBA	Check-out
16	Final Exam Group 2, 10:15-12:15, Monday May 14					

* Exam weeks. Exams are given 19:00-21:00 - 2/15, 3/29, 4/26 **in Collins Classroom Center 227**

Some very important dates:

Wed 1/31	week 2	Last day to drop a course so that course will not appear on student record
Fri 4/6	week 10	Last day to drop a course; W will appear on student record

Class Attendance: Attendance for all lectures, discussions and laboratories is expected as outlined in the UWSP Undergraduate Catalog. Class attendance will occasionally be taken, but will not directly affect your grade. Excessive absences will be reported to the registrar. Such absences may affect your financial aid, work-study or academic status. I do not need to know of individual absences, but please contact me in the event that several consecutive absences.

V. Text, websites and calculator

Brady and Senese. **Chemistry: Matter and Its Changes**. John Wiley and Sons, Inc, 4th Ed, ©2004. Available at the text rental.

The companion website to the text is <http://edugen.wiley.com/edugen/class/cls33100/>

You will be required to log in and create a profile during the first week using a Wiley-plus card provided to you in the first discussion section. Directions for registration to Wiley-Plus are at http://www.wiley.com/college/egradeplus/help_docs/student_quick_start_1.pdf

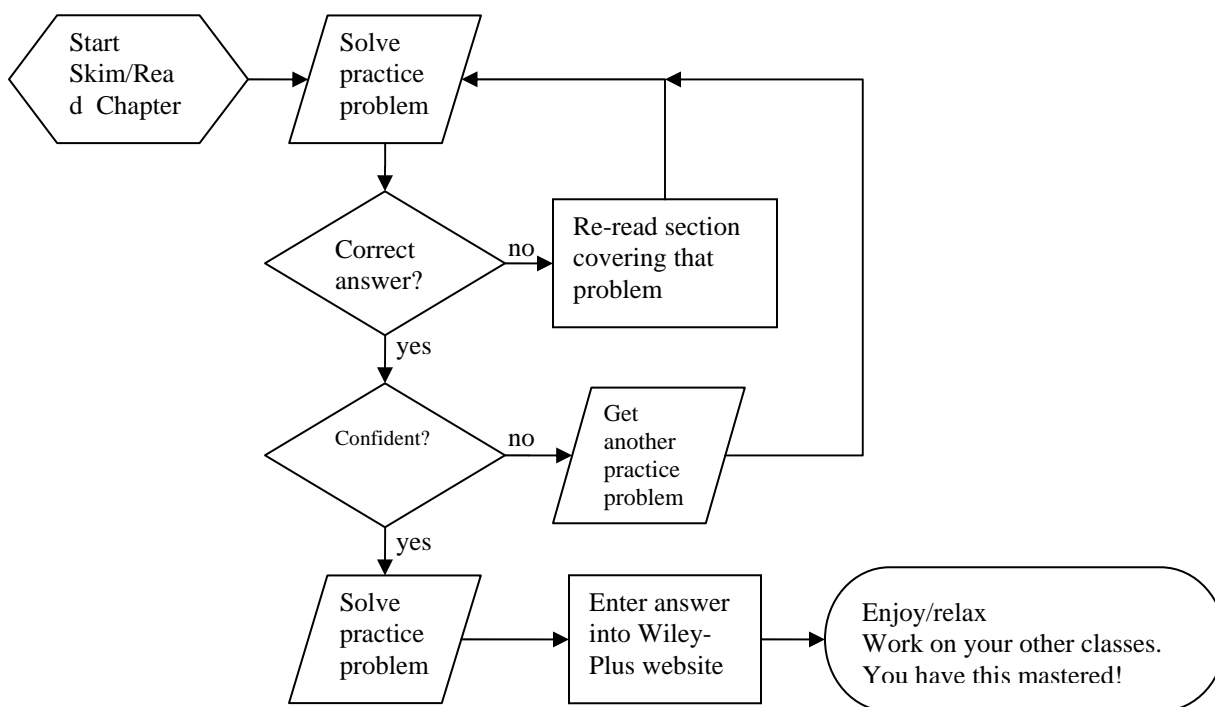
The website to access information about assignments, announcements, an archive of class emails, copies of class handouts, etc is at <http://chemdept-nmr.uwsp.edu/~mzach/Chem106/index.html>

A scientific calculator is required for this course, it may be used on exams and you are expected to know how to operate it. There will be no sharing of calculators on examinations. You may not use your cell phone as a calculator on an exam.

VI. Assignments

Practice of any skill is necessary to gain mastery. Solving problems in chemistry is no different. Some people seem to learn very quickly or are personally satisfied with a lower degree of proficiency (lower grade or a lower degree of pay, responsibility, etc.). The text and Wiley-Plus website offer numerous opportunities for practice. I will post on my website a list of problems that will be helpful to develop the skills that you will need for future classes and learn problem solving skills for the rest of life. There are two sets of problems for each class: required - graded problems and optional – additional practice problems. The required problems are accessible through the Wiley website which must be logged on using your email and password. The required problems are due at 11 AM on Mondays. After that time, you will still be able to access the assignment for practice, but no point value will be assigned. After all due dates for a given assignment are passed a key will be posted on the Wiley-Plus website. Each problem set is 10 points.

My recommendation for working on problem sets is as follows:



If you find yourself choosing either “no” pathway more than a few times, come see me. Let’s try a different approach! Life’s too short to keep trying the same problem over & over again!

VII. Quizzes and Exams

While the problem sets from the web are all multiple choice, matching, or fill in the blank, my quizzes are meant to probe a bit deeper and to help me assess the thought process. These may be any format including short 3-4 sentence essay. There are two questions that will frequently appear on your quizzes; it would be advisable to study these before each quiz. *Note: please visit my web site for an example of the type of answer I am looking to find.*

(1-3 pts.) In 3-4 complete sentences describe the procedure you are about to do. Be as specific as possible, but do not include the routine or minor steps. The emphasis should be on what you are going to do in lab. Address all of the major portions of the lab. Proofread your answer. Grammar counts!

(1 pt.) What are the safety considerations of which you need to be aware to complete this week's lab?

The remaining question(s) that will bring the weekly quiz total to 5 points may be from lab, lecture or demonstrations. The questions will probably be a bit more challenging than those in the weekly assignments. Some quizzes may be given so that you work with a partner to discuss the best answer; some quizzes will require you to work alone. They are all closed book and closed manual.

Since this course builds upon what you already know. The terminology and problem solving skills of the early weeks will be used as tools for solving problems later in the course (in some respect the exams are all cumulative, but emphasis will be placed on the content of chapters covered before each exam). In cases of borderline scores, I will look at the later exams and quizzes to make a judgment based on if your comprehension is improving.

Exams are closed book and will be given during the special exam periods as indicated on the timetable and on the schedule above. Attendance of these exam periods is your responsibility and no makeup will be given. Questions will be taken mainly from the lecture and assigned text, but questions from the lab or directly from quizzes are fair game. Specifics may be given as the exams are made up.

Typically the exams will consist of five types of questions: 1) multiple choice similar to the problem sets; 2) short, fill in the blank questions; 3) three or four short problems, definition or explanation questions; and 4) two of three longer essay or problem questions, for which partial credit will be given.

The final is cumulative with an extra emphasis on the last chapters that were not covered on the previous hour long exams. Because the entire course is cumulative and the material builds upon itself, I will substitute the percentage scored on final exam in the case of a "bombed" or missed exam. No early or makeup exams will be given for any reason. This applies to reasons of travel, oversleeping, sickness, hospitalizations, university athletic events, etc. Thus, the final exam can be used as a makeup exam or as a replacement for a bombed exam. Let me emphasize, there is no penalty for missing one of the first three exams, but it is then your responsibility to do well on the final. In all cases, the final exam score will be part of the final point total.

If you believe that you need additional time for exams, then you must make arrangements with Student Disability Services. I have always honored their recommendations and requests.

VIII. Laboratory

Laboratories give you a chance to practice what you learn in class. The lab manual is available from the UWSP Bookstore and is required. Make sure that your version is for Spring 2007, as this has significant changes from previous versions. It is very important to attend all labs as this makes up a substantial portion of your grade. In past years, the distribution of these points is very tight (mostly high point values) so that missing a laboratory is very detrimental to your overall score for the course. Due to large numbers of students and logistics of accommodating extra students into full lab sections, no make up laboratories will be allowed.

IX. Grading

There are many things in life more important than grades, but yet I am required to evaluate.

Total scoring possibilities

Twelve – problem sets	12 x 10 pts	120 pts
Thirteen – laboratory exercises	13 x 10 pts	130 pts
Thirteen – quizzes	13 x 5 pts	65 pts
Three – one hour exams	3 x 100 pts	300 pts
One – comprehensive final exam	1 x 200 pts	200 pts
Total		815 pts

Generally, final grades will be based on total points and will be assigned on the following curve:

93-100% = A	90-93% = A-	87-90% = B+	83-87% = B
80-83% = B-	77-80% = C+	73-77% = C	70-73% = C-
67-70% = D+	60-67% = D	Below = F	

I reserve the right to alter the percentages. I will under no circumstances raise this curve.

As your grades become available, you may check your progress through my secure grade server: <https://crbadger.uwsp.edu/~mzach/grade/106grade.cgi> To use this, you must use a web browser other than Internet Explorer (Mozilla Firefox recommended – free download at <http://www.mozilla.com/en-US/firefox/>) and log in using your campus username and password (If your password is longer than 12 characters, you must temporarily shorten it using the campus password utility <http://www.uwsp.edu/it/ulam2/changepwd/>)

X. Study Groups and Tutoring Services

Study groups are a great way to learn the content while having fun. Studies on learning show that study groups are one of the most effective ways to improve performance and learn the material so that it “sticks with you” long after the test. Tutoring services are also available through the Tutoring Learning Center (TLC). Specifics on this program will be emailed to you during Week 2 of the semester from the TLC. Costs are minimal unless students enrolled in Disability Services, Student Support Services, and Multi-Cultural Affairs in which case they are free.

XI. Academic Misconduct

This is an activity that I am not eager to discover, but yet I will be ever vigilant for it and treat it very seriously. Most of you are within a few years of being medical doctors, nurses, researchers, law enforcement officials, public servants, business owners, civic leaders and all other walks of life. If I catch someone cheating for a few points on some lab or assignment, I can only wonder what they might be capable of in real life when instead of a few points, they are cheating for money. A dentist filling teeth that have no cavities never learned that cheating in any form is wrong. This may be one of the last opportunities to learn that dishonesty is wrong and has serious consequences. My suggestion is to know that you honestly earned every point that you get. Please refer to Chapter 14 of the UWSP Community Rights and Responsibilities Handbook if you have any questions on what constitutes academic misconduct. I intend to enforce it and have little sympathy for misconduct.
<http://www.uwsp.edu/admin/stuaffairs/rights/rightsChap14.pdf>

XII. Common courtesy

Please silence all cell phones and refrain from using iPods, Walkmans or other electronic entertainment devices during class. If there are instances where distracting behavior is taking place, I will not hesitate to ask that the distraction be removed. Common courtesy to your fellow students is requested. Likewise, if you ever feel that I have been disrespectful in any way, please let me know so I can extend common courtesy to you as well.

Email etiquette: Email is a great business communication tool. As with any tool, you need to use it correctly. Please construct any email as you would if you were sending it to a future employer. Before sending any email, consider that this is a document that is lasting and others may judge you upon its style and contents. While you will not be graded on emails, it is a sign of respect to keep the tone professional, and to use accurate spelling, grammar, capitalization and punctuation. I want you to succeed in all of your goals. Nothing will impress a potential employer more – in a negative way – than sending a hasty email full of errors and teenage like dialog. Start practicing good use of email now so that you are comfortable in using this tool when you apply for that really good job.

XIII. Suggestions for Studying:

- 1) Skim each chapter before you start reading. The section headings and bold-type words should give you a sense of the chapter's material. I strongly recommend doing this before I start the chapter in lecture.
- 2) Attend the lectures. I will follow the authors' order of topics fairly closely so my presentation of the material should complement the textbook. I will also relate the material that I am presenting to past and future topics. The lectures set the pace for the course.
- 3) Take notes during lecture but don't try to write down every word. You may want to flesh out your lecture notes when you read the textbook.
- 4) Read the textbook but don't try to read it all at once. The lectures will set the pace and you should try to read the relevant sections before the next class period. Remember that part of your education is to become literate at the college/university level and that means you must be able to read college-level textbooks.
- 5) Take notes when you read but keep them to a minimum. For example, write down, or sketch, as appropriate:
 - a) section and subsection headings and a brief description,
 - b) terms in bold, italicized or underlined type and brief definitions,

- c) important figures, tables and diagrams,
 - d) important equations, the meaning of each term and the units that appear in it,
 - e) a functional summary of the example problems in each section.
- 6) Work problems.
- a) Study the examples that appear in the sections.
 - b) Work the suggested conceptual and practice problems (end of the chapter) as soon as you finish reading the relevant section. You may peek at the book or your notes but try to get your own answer before looking at the authors' answer. For your convenience, answers to the odd-numbered problems are provided at the back of the book.
 - c) Work the general problems and supplemental problems without peeking at anything. Remember that you can't peek when you take an exam.
 - d) Working a few problems every day or two is much more valuable than trying to do them all in one marathon session the day before an exam.
 - e) Don't spend more than 5 minutes trying to start a problem.
 - f) Don't work the same problem over and over and over again. It may be helpful to rework a selection of problems as you study for an exam.
 - g) If you spend 30 minutes on problems and you haven't worked any of them correctly, please come for help. We need to take a different approach.
- 7) Attend discussion sections. I will pose a variety of problems based on material from the three previous lectures, give you some time to work on them individually and then provide the solutions. You can also ask questions about assigned problems.
- 8) If you are really stuck on a problem ask other students, come see me during office hours.

Name (please print):

Laboratory Section (circle the appropriate one)	M @ 8 AM sec 8	T @ 8 AM sec 9	T @ 2 PM sec 10
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I have received a copy of the course syllabus and the following items from it have been explained to me to my satisfaction:

- 1) the lecture schedule including the dates for the three one-hour exams and final exam;
- 2) the grading policy for the course including the point totals for all of the problem sets, quizzes, laboratory experiments, final exam and the grading scale;
- 3) the policy for missed* or bombed hour exams (no early takes nor makeups allowed, percentage of final exam will replace the missed or bombed exam if it is a better score);
- 4) the policy for missed* experiments (no makeups allowed);
- 5) the attendance policies for lecture, discussion and lab;
- 6) the need for a scientific calculator;
- 7) extenuating circumstances, such as extended absences, will be dealt with on an individual basis. However, the belief that the final exam is more difficult than any one of the hour exams does **not** constitute an extenuating circumstance.

* **These policies cover all absences. Since I can't reliably judge every student's absence to determine whether or not it is legitimate, these policies enable me to treat everyone equally and as fairly as possible. If you believe that you have extenuating circumstances that are not covered by these policies, then please see me as soon as possible. If you are not satisfied with my decision, you may take your case to the Dean of the College of Letters and Science.**

I understand the following policies and practices that will be in effect during examinations:

- 1) All notes and books will be closed and put away 5 minutes before the start of the test period.
- 2) Exams will be passed out face-down at the beginning of the test period and will not be turned face-up until everyone has a copy and the instructor announces that it can be started.
- 3) Looking and even glancing at another exam is considered cheating and will not be tolerated. Similarly, allowing others to look at your exam is also considered cheating. The instructor will issue warnings and/or assign alternate seats for instances of possible cheating. Cases in which cheating is strongly suspected will be dealt with according to UWSP policies on Academic Misconduct.
- 4) All writing must stop at the end of the test period.
- 5) Caps may be worn but the bill must face backwards during the exams.
- 6) No sharing of calculators during the exam.
- 7) No electronic devices other than a calculator may be present during the exam without instructor approval. **Cell phones are not considered calculators.**

I agree to abide by all of the policies described in the syllabus and listed on this page.

Signature: _____ **Date** _____

The following list describes situations that this exam policy covers. It is not exhaustive but it includes situations that I have encountered in previously. Note that these are not exceptions and no make up exams will be given.

- 1) Personal events – illness, injury, transportation trouble, employment obligations, military obligations, jury duty, sports team participation, UWSP events, conference attendance, religious obligations ...
- 2) Family events - births, deaths, illness, vacations....