



SYLLABUS for CHEMISTRY 106
FUNDAMENTAL CHEMISTRY
Fall 2009

INSTRUCTOR
Dr. Thomas M. Zamis

University of Wisconsin-Stevens Point
College of Letters & Science
Department of Chemistry

I. Course Description

A. Fundamental Chemistry

This course is the second semester of a two semester sequence intended for students who desire one year of college chemistry. The emphasis of the course will be on the fundamental principles of general chemistry, which include terminology, qualitative concepts, quantitative skills and laboratory skills. The general topics included in the second semester are: Liquids and Solids, Organic/Biochemicals, Properties of Solutions, Chemical Equilibrium, Acids and Bases, Salts, Thermodynamics, Electrochemistry, and Kinetics.

B. Information for Spring Semester

TIMES:	Lecture 1	M,W,F	12:00 - 12:50	Room Science A121
	Discussion 1	R	11:00 - 11:50	Science A110
	Discussion 2	R	12:00 - 12:50	Science A110
	Discussion 3	R	14:00 - 14:50	Science A110
	Lab 1	W	8:00 - 10:50	Science C124 Zamis
	Lab 2	T	11:00 - 13:50	Science C124 Zamis
	Lab 3	M	14:00 - 16:50	Science C124 Zamis

REQUIRED MATERIALS

TEXTBOOK: Brown; LeMay; Bursten; Murphy *Chemistry, the Central Science* 11th ed. Pearson Education: Upper Saddle River, NJ, 2009.

LABORATORY EXPERIMENTS: You will need to obtain a Chemistry 106 Laboratory Packet; bring it with you to each laboratory session.

SCIENTIFIC CALCULATOR: You should have on hand for lectures, discussions and laboratories a calculator capable of performing the basic mathematical functions (+, -, x, ÷), as well as those involving natural logarithms and exponentials ($\ln x$, e^x), and base 10 logarithms and exponentials ($\log x$, 10^x). You should be familiar with entering numbers in scientific notation on your calculator and performing calculations with numbers in this form.

INSTRUCTOR: Dr. Tom Zamis

Office Science B135 Phone 346-3258

Office Hours: M 1:00, T 9:00, W 1:00, R 9:00, F 10:00.

or other times by appointment.

II. Course Outline (Schedule of Topics)

<u>Week</u>	<u>Dates</u>	<u>Exam #</u> <u>Quiz #</u>	<u>Topics</u>
1	9/2 - 9/4		Introduction, 105 Concepts Review
2	9/8 - 9/11		Organic Chemistry - Naming, Polymers, Biochemicals
3	9/14 - 9/18	Q1	Liquids and Solids - Intermolecular forces; Liquid properties; Solid structures
4	9/21 - 9/25		Solutions - Concentration units; Colligative properties
5	9/28 - 10/2	E1	Kinetics - Reaction rate; Arrhenius; Catalysis
6	10/5 - 10/9		Chemical Equilibrium - Equilibrium constants; Equilibrium tables; Response to change
7	10/12 - 10/16	Q2	Thermodynamics - 1st Law; Enthalpy; Entropy
8	10/19 - 10/23		Gibbs Free Energy and Equilibrium
9	10/26 - 10/30	E2	Acids & Bases - pH; Strengths; Salts
10	11/2 - 11/6		Acid-Base Equilibria - Solution pH, Buffers
11	11/9 - 11/13	Q3	Acid-Base Equilibria - Titrations
12	11/16 - 11/20		Solubility equilibria - precipitation, complex-ions
13	11/23 - 11/25	E3	<i>Exam & Thanksgiving</i>
14	11/30 - 12/4		Electrochemistry - Batteries; Corrosion
15	12/7 - 12/11		Nernst equation; Electrolytic cells

Final Exam Monday December 14, 10:15 - 12:15

III. Principal Assignments

A. Reading - Brown; LeMay; Bursten; Murphy *Chemistry, the Central Science* 11th ed. Pearson Education: Upper Saddle River, NJ, 2009.

Lecture Topics	Chapters	Sections
Organic Chemistry- Naming, Polymers, Biochemicals	25	1 2 3 4 6
Intermolecular forces, Liquids and Solids- Liquid properties; Solid structures; Phase equilibrium; Enthalpy	11	1 2 4 5 7
Solutions- Solubility; Concentration units; Colligative properties	13	1 2 3 4 5
Chemical Kinetics- Reaction rate; Arrhenius; Catalysis	14	1 2 3 4 5
Chemical Equilibrium- Equilibrium constants; Equilibrium tables; Response to change	15	1 3 5 6 7
Chemical Thermodynamics- 1st Law; Enthalpy; Entropy	19 (and 5)	1 2 4 2 4 7
Gibbs Free Energy and Equilibrium	19	5 6 7
Acid-Base Equilibria- pH; Strengths; Salts	16	1 2 3 4 5 6 7 8
Acid-Base Equilibria- Solution pH, Buffers, Titrations	17	1 2 3
Additional Aqueous Equilibria- precipitation, complex-ions	17	4 5
Electrochemistry- Batteries; Corrosion	20	1 2 3 4 5 6 9

B. Supplementary Material

As stated in the course objectives, you will be responsible for the information contained in certain **Tables** and **Figures** from your textbook. You should obtain **handouts** of this material from your instructor for easy reference in lecture and discussion.

Summary sheets may be provided periodically by your instructor to assist you in studying for quizzes and exams. Additional exercises involving **application type problems** will also be provided periodically.

Your instructor will also make available, on his web page, all course materials from lecture and discussion, and locations on the **World Wide Web** that have useful instructional materials.

IV. Conduct and Evaluation Procedures

A. Attendance

Attendance is not required for lecture, however the majority of the material that you will be responsible for is presented in lecture. Be sure to obtain notes from your peers on those rare occasions that you miss lecture.

Attendance is expected for discussion. These small group sessions are your opportunity to question and interact closely with your instructor. Quizzes will be given during discussions, and any unexcused absences can not be made up. An *excused absence* requires that **verifiable** arrangements be made with your instructor **in advance** for things like off-campus trips or personal appointments; or following an emergency or illness, a **written note from you** is presented upon returning that explains the situation and lists persons that may be contacted to verify your situation. **Attendance is required for quizzes, examinations and laboratory.**

B. Student Conduct

The following are from the University publication "Community Rights and Responsibilities". The full document is available from the UWSP Web Page under Student Life.

Nearly 10,000 students, staff, faculty and visitors descend on our one square mile campus each day of the academic year. It is apparent that as a learning community, we need standards or codes of conduct which clarify the behavioral expectations for our academic and nonacademic environments. The policies and procedures spelled out in our Community Rights and Responsibilities publication provide for a sense of order for all while respecting the dignity and rights of individuals. Through these policies, civility within our learning community is affirmed, diversity is pursued, the importance of each person is honored and well defined procedures guide behavior for the common good.

UWSP 14.01 STATEMENT OF PRINCIPLES. The board of regents, administrators, faculty, academic staff and students of the University of Wisconsin system believe that academic honesty and integrity are fundamental to the mission of higher education and of the University of Wisconsin system. The university has a responsibility to promote academic honesty and integrity and to develop procedures to deal effectively with instances of academic dishonesty. Students are responsible for the honest completion and representation of their work, for the appropriate citation of sources, and for respect of others' academic endeavors. Students who violate these standards must be confronted and must accept the consequences of their actions.

UWSP 14.03 ACADEMIC MISCONDUCT SUBJECT TO DISCIPLINARY ACTION. (1) Academic misconduct is an act in which a student:

- (a) Seeks to claim credit for the work or efforts of another without authorization or citation;
- (b) Uses unauthorized materials or fabricated data in any academic exercise;
- (c) Forges or falsifies academic documents or records;
- (d) Intentionally impedes or damages the academic work of others;
- (e) Engages in conduct aimed at making false representation of a student's academic performance; or
- (f) Assists other students in any of these acts.

(2) Examples of academic misconduct include, but are not limited to: cheating on an examination; collaborating with others in work to be presented, contrary to the stated rules of the course; submitting a paper or assignment as one's own work when a part or all of the paper or assignment is the work of another; submitting a paper or assignment that contains ideas or research of others without appropriately identifying the sources of those ideas; stealing examinations or course materials; submitting, if contrary to the rules of a course, work previously presented in another course; tampering with the laboratory experiment or computer program of another student; knowingly and intentionally assisting another student in any of the above, including assistance in an arrangement whereby any work, classroom performance, examination or other activity is submitted or performed by a person other than the student under whose name the work is submitted or performed.

C. Grading Policy

Your final grade for Chemistry 106 will be based on the total number of points earned out of 1000. The distribution of points is as follows:

Hour Exams (3 @ 150 pts)	450 points	(F 10/2 and 10/30;W 11/25)
Final Exam	200 points	
Quizzes (3 @ 50 pts)	150 points	(R 9/17;10/15;11/12)
Lab Reports	150 points	
Department	50 points	

The tentative levels of achievement required for letter grades are:

"A" 900 points "B" 800 points "C" 700 points "D" 600 points

These levels will not be raised.

V. Course Objectives

My teaching philosophy centers around the idea that *understanding*, *interpretation* and *application* of general factual material are most important in providing a positive learning environment and a long lasting intellectual impression. It is your responsibility to learn the material listed as objectives. I will try to help you develop a positive attitude towards chemistry and motivate you to work hard to learn the fundamentals of this interesting and important subject. I will do this by presenting stimulating lectures, discussions and labs that include demonstrations, graphics, videos, Web resources, current articles, real-world applications, handouts and study sheets - and your participation! I will give you individual help and guidance when you ask me to - and I hope you will feel free to ask me when you need it! Your learning will be evaluated with the use of exams and quizzes that will cover only the material listed in the objectives.

For a student beginning the study of chemistry, *understanding* must begin with a fundamental knowledge of the precise *chemical* meanings of the terminology you will encounter. In other words, you must be able to understand the words that you read and hear. Chemical terms that you must understand are listed for each text chapter in the objectives.

Interpretation involves taking the basic information you read and hear in **Lecture**, making sense of it, and being able to explain it (to yourself, to me, and to others). The major concepts you should be able to interpret are listed for each chapter in the objectives. Your opportunity to practice and question interpretations is during the weekly **Discussion**.

Application is when you can put your knowledge to some specific or practical use or solve a problem. Many of the Exercises listed in the objectives for each chapter, and all of your work in **Laboratory**, will allow you to experience and practice the application of chemistry.

Chemistry 106
Laboratory Schedule - Fall 2009
Weekly Experiments

LABORATORY Manual:
"Lab Manual for Chem 106"

Week Of:	Title of Experiment
Sept. 8	Check-in
Sept. 14	Separation of Amino Acids by Paper Chromatography
Sept. 21	Synthesis of Aspirin
Sept. 28	Endothermic and Exothermic Reactions
Oct. 5	Freezing Point Depression
Oct. 12	Kinetics of Crystal Violet Decomposition
Oct. 19	LeChatelier's Principle
Oct. 26	Group III Cations: First and final forms plus unknown
Nov. 2	Anion Analysis: First and final forms plus unknown
Nov. 9	Solubility and Thermodynamics of Potassium Nitrate
Nov. 16	pH Titration of a Diprotic Acid
Nov. 23	Buffers
Nov. 30	Electrochemical Cells
Dec. 7	Checkout