

Chem 100X

Chemistry in Complex Systems

Fall 2008

Lecture: MWF 11:45-12:45 PM NSF 201B
Recitation: TBA
Instructor: Lawrence K. Duffy, 362 NSF x7525
Lecture Text: Chemistry in Context (6th Edition)
Lab Text: Lab Manual
Office Hours: 4-5 PM Thursdays or by appointment (x7525)
Email: fflkd@uaf.edu

Philosophy: At the same time political scientists and policy experts worry about a social system which faces an increasingly technological world, universities work to show students the role of the basic chemical and biochemical sciences as they function within the context of complex natural systems. Chemistry and biochemistry are central to the world around us and it is not that difficult to understand them or their importance to our social and economic systems. There are no prerequisites for this course.

Course Objectives: The overall objectives of this course are to provide each of you with a basic literacy of some chemical and biochemical principles, an appreciation of how chemistry pervades complex systems, some historical aspects of its concept development, an ability to understand some of the scientific issues which confront us as citizens, and an appreciation of how, and the extent to which, science is able to solve our problems (or create them).

The specific goals are: 1) to become familiar with the methods and ethics of science used by chemists and biochemists; 2) the role of uncertainty, hypothesis testing, and weight of evidence in environmental issues; 3) major concepts of chemistry such as conservation of matter, chemical reactions, pH, pollution effects, etc..

Class Conduct: The attached class schedule is my best estimate of how we will cover some of the material in the text. Students are encouraged to attend class and to contribute to discussion on the content and issues discussed in the text. However, my intent is to thoroughly cover whatever we attempt rather than to “stay up with the syllabus no matter what.” At any rate, during lecture periods I will try to help you understand the material and discuss some of the things about which you have read. The laboratory part of the course consists of an activity each week which is, in some way, related to lecture material. I expect you to regularly attend lecture and require that you regularly attend lab. My assumption will be that you have done the assigned reading (sections of chapters) and preparation before you come to lecture or lab. UAF Conduct and Safety Policies including Code of Conduct in the class schedule for Fall 2006 (pages 108-114) and the UAF catalog. Cheating is not tolerated, and a grade of F can be assigned.

Lecture Text: This year we are using a basic, straightforward text. The text is organized several sections. The first part is the structure of matter and some chemical concepts. Other chapters are related to water, energy and drugs.

Grading Scheme: Your grade will be computed on the following numerical basis:

Quizzes (10)	100
3 Exams	300
Final	100
Book Report	(25) Optional
Lab	<u>100*</u>
Total	600*

The grades will not be curved but I reserve the ability to adjust grades upward. Individual effort will be noted. Letter grades will be assigned with the following approximate cutoffs: A = 540; B = 480; C = 360; D = 300.

* Education majors or service learning grades will be modified as described in lab section.

FRESHMAN GRADES – will be based upon quizzes and exam 1 that are taken before Oct 7.

Quizzes: Each Monday there will be a 10-15 minute quiz at the end of class (10 pts) covering the previous week's material. Your best 10 scores will count toward your grade. No make-up quizzes will be given.

Exams: The hour exams will cover material from textbook chapters as well as associated concepts from the laboratory. The Final will cover only the last part of the course.

Book Report: (Extra Credit and Optional) Each student can turn in a book report. Both literary and scientific content will be evaluated. The book report should be 600-800 words describing the book and its relation to the course. The book report will be on an appropriate book, such as 1) Cantor's Dilemma, 2) .When Smoke Ran Like Water, 3) Firecracker Boys, etc.. A list of these books will be provided on the first day of class. If you exercise this option, the book report is due on May 3, 2006. The book report should be no longer than 3 pages.

Lab: Each experiment will require a report (generally to be turned in before you leave lab). You will be graded on the quality of your personal results (where appropriate), your report, and your level of participation in group activities. Your teaching assistant will be responsible for assigning lab grades, and he/she will explain how your point total for lab will be determined. Some lab activities will be 1) review for exams, 2) videos of issues in modern chemistry, 3) watching of the play "Oxygen", 4) safety instruction, and 5) assessment exercises. You must attend **EVERY** lab.

Lab Section: See your lab book for rules applicable only to your section and the lab schedule. If you are going to miss a lab see the TA beforehand. If you ignore the TA or safety rules, you will be dismissed from the lab and the course.

Homework: Doing the homework problems is the key to success. I will suggest problems from the "Exercises" section at the end of each chapter and the solutions to these questions are on pages 627-640 in your book. None of this work is to be turned in; but if you have questions we should discuss them in class. Working with these exercises is part of what you must do to prepare for quizzes and exams. Some of the quiz material will come from the end of chapter exercises.

Extra Quiz Credit: Occasional seminar speakers will be on campus to address the topics we are covering. Attendance at the seminar will be equal to 10 points (one quiz). Like the book report, seminar attendance is optional.

Examination Make-ups: Exams can not be made up unless you arrange a time before the exam and you have a valid excuse. In the event of an unforeseen emergency, contact me as soon as possible. You may be asked to document your excuse. **KEY WORDS: TALK TO ME.** In general, no work will be accepted after the Final Exam.

Disabilities: Students with a physical or learning disability are required to identify themselves to Mary Matthews in the Disability Services office, located in the Center for Health and Counseling in order to receive special accommodations. The student must provide documentation of the disability. Disability Services will then notify me of special arrangements for taking tests, working homework assignments, and doing lab work.

Department Policy on Cheating: The Chemistry & Biochemistry Department Policy on Cheating is: *“Any student caught cheating will be assigned a course grade of F. The student’s academic advisor will be notified of this failing grade and the student will not be allowed to drop the course.”* The department considers performing unauthorized “dry labs” as cheating. Partnering during the lab is acceptable but lab reports must show your own calculations and ideas.

UAF Attendance Policy:

You are expected to attend classes regularly; unexcused absences may result in a failing grade. You are responsible for conferring with your instructor concerning absences and the possibility of arranging to make up missed work.

If you are required to participate in either (a) military or (b) UAF-sponsored activities that will cause you to miss class, you must notify your instructor as soon as possible of your absence. You must notify your instructor(s) of all scheduled UAF-required absences for the semester (e.g., travel to athletic events) during the first week of classes.

You and your instructor will make a good faith effort to make suitable arrangements to assure that you can make up classes and work you miss and are not penalized for your excused absence. If suitable arrangements cannot be made, you will be allowed to withdraw from the course without penalty. However, your instructor is under no obligation to allow you to make up missed work for unexcused absences or if notification and arrangements are not made in advance of the absence.

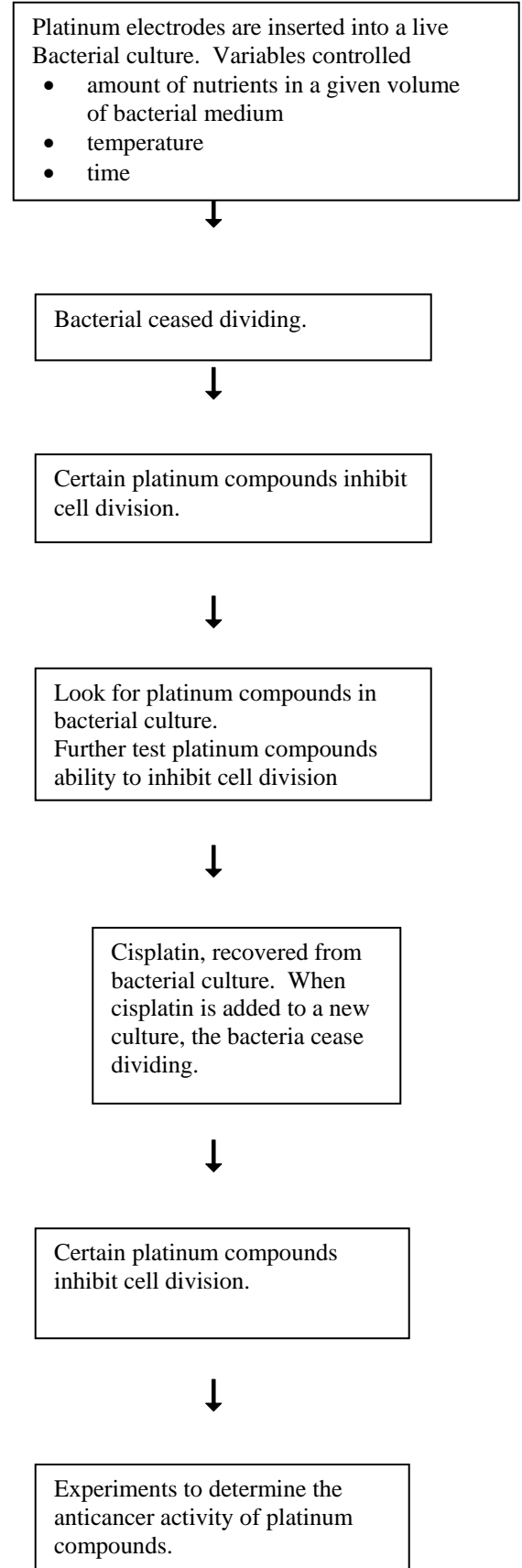
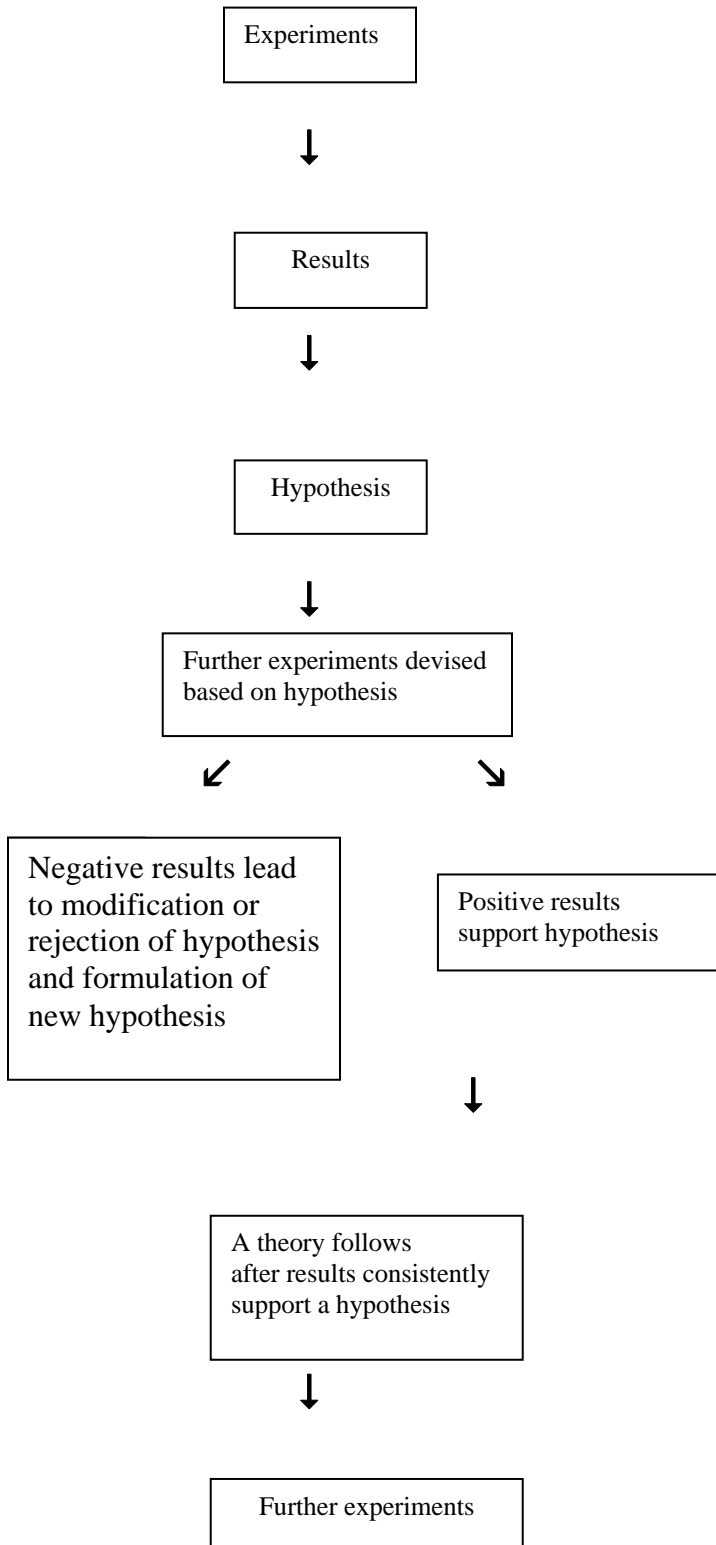
SCIENTIFIC METHOD

A representation of the scientific method

An Example:

Rosenberg's Work

General Steps



Chem 100 Lecture Plan
Fall 2008

Lecture *	Title	Chapter	Historical	Societal	Culture
W 1	Intro to Chemistry and Scientific Method	1	Cisplatin	Air Pollution	Alaska Natives
M 2 W 3	States of Matter Electromagnetic Radiation	2	Oxygen	CFCs	
M 4 W 5	Elements in the Earth Trophic Levels, Carbon Cycle	2 and 3	Formation of the Atmosphere/Oceans	International Agreements	
M 6 W 7	Exam I (Ch 1-2) Atomic Model		Priestly	Carbon Dioxide Policy	
M 8 W 9	Reactions & Periodic Table Chemical Equations (Balancing)	4	Haber Process	World Wars	Ages
M 10 W 11	Electrons Ionic Bonding	4	Table Salt	Energy	
M 12 W 13	Lewis Dot Covalent Bonds	5		Ecosystems	
M 14 W 15	Intermolecular Forces	6	Linus Pauling	Water Quality	Seven Generations
M 16 W 17	Exam II (Ch 3-5) Nuclear Reactions Health Effects	7	Marie Curie	Atomic Bomb	Firecracker Boys
M 18 W 19					
M 20 W 21	Exam III (Ch 6-7)				
M 22 W 23	Carbon Functional Group	9	Rubber	Recycling	Natural Products
M 24 W 25	Problems with Polymers Coal and Petroleum	10	Plastics	Superfund	Caribou Gut
M 26 W 27	Waste Disposal Hydrologic Cycle		London Smog	Love Canal	Hunter Gather Society
M 28 Dec 16 Sat.	Nutrition FINAL EXAM 5:45-7:45 Dec 16, Saturday	13	Proteins	DNA	Food Preservation

LAB SCHEDULE

Lab 1	Safety Lab Recognizing Chemical Hazards
	The Play: "Oxygen" Film
Lab 2	Separation of a Mixture
Lab 3	Purification of Water
Lab 4	Fractional Distillation of Crude Oil
Lab 5	Metals & Nonmetals
Lab 6	Concentration Units
Lab 7	Chernobyl 1 & 2
Lab 8	Nuclear Radiation
Lab 9	pH of Common Substances
Lab 10	Acid Rain
Lab 11	Classification of Plastics for Recycling
Lab 12	Environmental Sampling Project
Lab 13	Science Policy Essay

You must attend **EVERY** lab.