

Chem 103

LK Duffy

Fall

2022

Chem 103: Basic General Chemistry for Health Sciences

Instructor: Lawrence Duffy

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Office Hours: M-F 8:30-10:00 am

Lecture: ~~9:15-10:15 am~~ MWF 9:15 - 10:15

Lab: See schedule

Course Description: Fundamentals of chemistry including historical and descriptive aspects. Fulfills the laboratory part of the natural science requirement and prepares the student for Chem 105X and Chem 104X.

Philosophy: At the same time health 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 medical 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.

Course Objectives: The overall objectives of this course are to provide each of you with an understanding of some chemical principles, an appreciation of how chemistry pervades our society, the 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 of which, science is able to solve our problems (or create them).

The specific goals are: 1). to become familiar with the methods of science used by chemists and biochemists; 2). the role of experimentation and hypothesis testing; 3). major concepts of chemistry such as conservation of matter, catalysis, pH, etc.; 4). the role of chemistry in society and medicine as evidenced by readings or magazine reports.

Learning Objectives:

1. What is the difference between matter and energy?
2. What feature of the atom determines its identity?
3. What are the fundamental types of chemical bonds, and how are they formed?
4. What is a chemical reaction? How does one balance a reaction? What is the definition of a mole? And how does it allow for the determination of mass-mass relationships in chemical reactions?
5. What are states (phases) of matter and how do intermolecular forces affect the phase at a given temperature?
6. What is a solvent, and what general feature of the solvent determines the types of solutes that will dissolve?
7. What is the activation energy for a reaction, and how does this energy influence the rate of a reaction?

8. What is the definition of an acid (a base)?

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

3 Exams	300	
Final	100	Comprehensive
<u>Lab</u>	<u>100*</u>	
Total	500*	

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 = 450; B = 400; C = 300; D = 200. Plus and minus grades will be used.

Exams: The hour exams will cover material from textbook chapters as well as associated concepts from the laboratory. The Final will cover the whole course, but the major component of the exam will focus be on the material covered since the third exam.

Examination Make-ups: Exams cannot 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.

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 may be 1) review for exams, 2) videos of issues in modern chemistry, 3) safety instruction, and 4) 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 in the back of 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 exams.

Lecture Text: This year we are using a classic text that is organized by sections and is based on current issues related to biomedicine. The first part is the structure of matter and some chemical concepts. Other chapters are related to organic chemistry and biochemistry.

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.

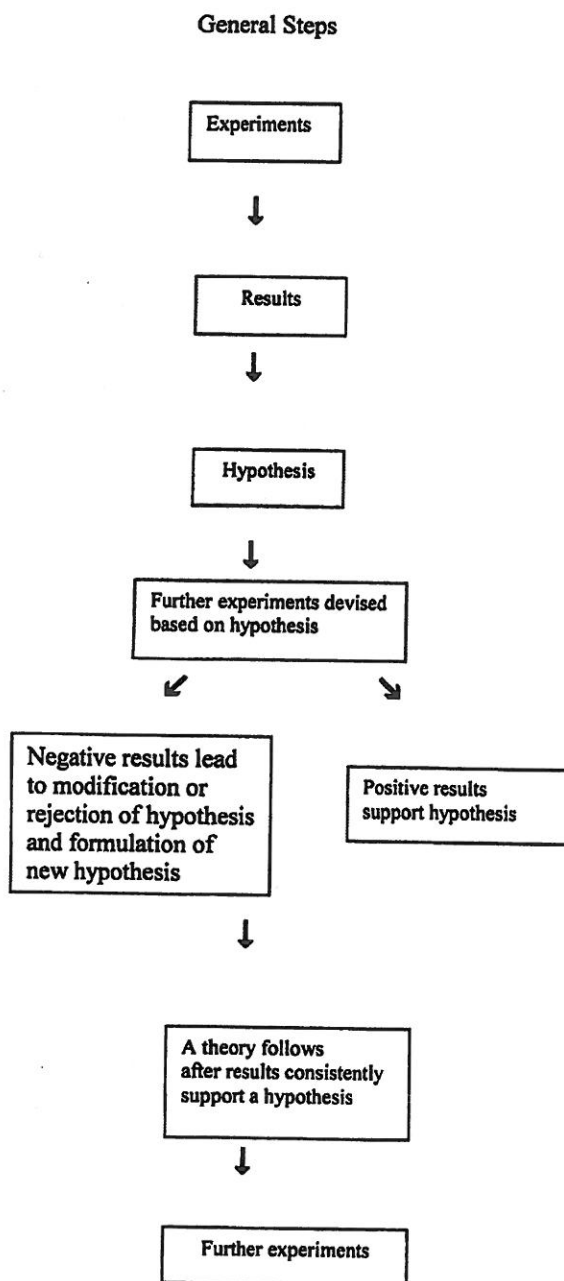
If you are required to participate in either (a) military or (b) UAF-sponsored activities that will cause you to miss class, you must notify your instructor as soon as possible of your absence. You must notify your instructor(s) of all scheduled UAF-required absences for the semester (e.g., travel to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

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.

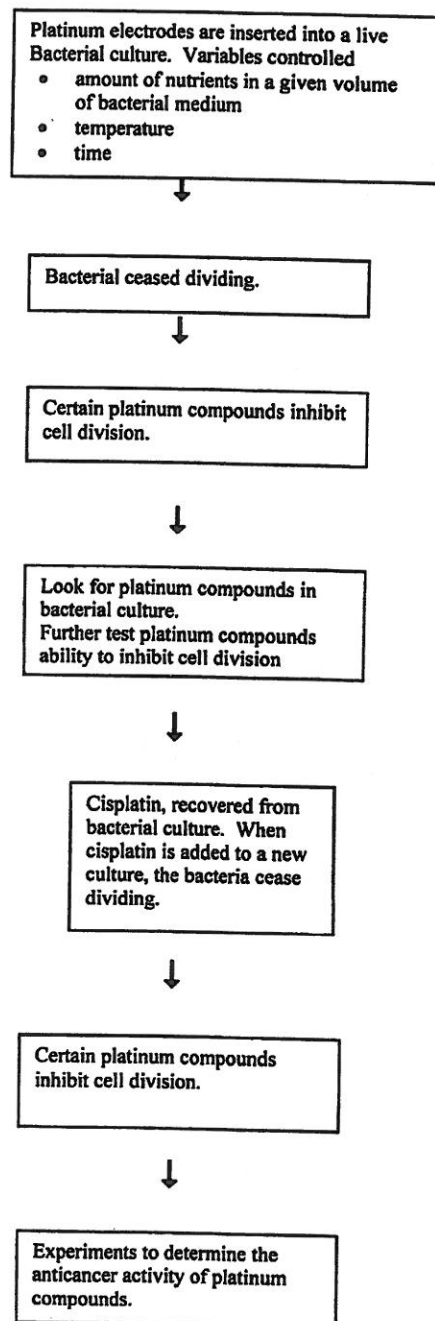
SCIENTIFIC METHOD

A representation of the scientific method



An Example:

Rosenberg's Work



Week	Lecture	Title	Chapter	Labs
September 5	1	Introduction		No lab
September 9-13	2	Scientific Method	1	No lab
	3	Matter	1	
September 16-20	4	Measurements and Unit Conversions	1	#1 Safety
	5	Structure of the Atom	2	
September 23-27	6	Electron Orbitals and Periodic Table	2	#2 Measurement
	7	EXAM 1 (9/27)		
September 30- October 4	8	Octet Rule and Chemical Bonds	3	
	9	Ionic and Covalent Compounds	3	
October 7-11	10	Naming of Simple Covalent Compounds	3	Ozone/naming
	11 (10)	Shapes and Properties	3	
October 14-18	12	EXAM 2 (MIDTERM)		
	13	Mass Relationships	4	#4 atomic models
October 21-25	14	Balancing Chemical Reactions	4	# 5 Formulas and Moles
	15	Oxidation Reduction/Heat of Reaction	4	
October 28-November 1	15	Kinetic Molecular theory	5	#6 Redox
	16	Gas Laws/Liquids/Solids	5	
November 4-8	17	Solutions	6	
	18	Water as a Solvent	6	
November 11-15	19	Colligative Properties	6	#7 intermolecular forces
November 18-22	20	Reaction Rates	7	#8 Airbags
	21	Equilibrium	7	
November 25-29	22	Acid and Bases	8	# 9 acid Lab/battery lab
	23	EXAM 3 take home (Thanksgiving break)		
December 2-6	24	Ionization constants	8	#10 Pebble case study essay
	25	pH Scales/Buffer	8	
December 9-13	26	Radioactivity and Half- life	9	No lab. Review. Turn in essays.
	27	Fission and Fusion	9	

Note : Schedule may change due to weather and University policy changes and illness.

NOTES ON SYLLABUS AND UNIVERSITY POLICIES

- 1. UAF is an AA/EQ employer and educational institution and prohibits illegal discrimination against any individual.**
- 2. This course follows the UAF policy Incomplete Grade Policy.**
The letter "I" is a temporary grade used to indicate that the student has satisfactorily completed (C or better) the majority of the courses work, but for personal reasons beyond the student's control has not been to complete the course during the regular semester.
Negligence or indifference are not acceptable reasons for an "I" grade
- 3. UAF "C" grade policy.**
"C-" grade is not the same as a C for this course.
- 4. Speaking Center is available (807-474-5470)**
- 5. Writing Center is available (807-474 -5314)**
- 6. Developmental MATH lab is available in the Gruening BLDG.**
- 7. UAF has information and resources on the ACADEMIC ADVISING RESOURCES LIST.**
 - 8. EMERGENCY NOTIFICATION PLAN. (see student handbook)**
 - a. in class by instructor as a relay
 - b. via phone and email
 - 9. Extended Absence Policy (see Student Handbook)**
 - a. Personal illness or injury
 - b. bereavement
 - c. military obligations
 - d. Jury service
 - e. Serious illness of family or friend
 - f. other emergencies
 - 8. Technical Requirements**
 - a. Access to textbook
 - b. Access to Internet
 - c. access to a computer
 - d. access to a phoneStudent needs a computer for online course material and the ability to upload or download material.

Syllabus Addendum

The UAF Faculty Senate approved the concept of the syllabus addendum in May 2020. The syllabus addendum contains non-academic information for all UAF syllabi. See a Google Doc version of the syllabus addendum linked here.

Syllabus Addendum (Revised 8/18/2021)

COVID-19 statement: Students should keep up-to-date on the university's policies, practices, and mandates related to COVID-19 by regularly checking this website: <https://sites.google.com/alaska.edu/coronavirus/uaf?authuser=0>

Further, students are expected to adhere to the university's policies, practices, and mandates and are subject to disciplinary actions if they do not comply.

Student protections statement: UAF embraces and grows a culture of respect, diversity, inclusion, and caring. Students at this university are protected against sexual harassment and discrimination (Title IX). Faculty members are designated as responsible employees which means they are required to report sexual misconduct. Graduate teaching assistants do not share the same reporting obligations. For more information on your rights as a student and the resources available to you to resolve problems, please go to the following site: <https://catalog.uaf.edu/academics-regulations/students-rights-responsibilities/>.

Disability services statement: I will work with the Office of Disability Services to provide reasonable accommodation to students with disabilities.

Student Academic Support:

- Speaking Center (907-474-5470, uaf-speakingcenter@alaska.edu, Gruening 507)
- Writing Center (907-474-5314, uaf-writing-center@alaska.edu, Gruening 8th floor)
- UAF Math Services, uafmathstatlab@gmail.com, Chapman Building (for math fee paying students only)
- Developmental Math Lab, Gruening 406
- The Debbie Moses Learning Center at CTC (907-455-2860, 604 Barnette St, Room 120, <https://www.ctc.uaf.edu/student-services/student-success-center/>)
- For more information and resources, please see the Academic Advising Resource List (https://www.uaf.edu/advising/lr/SKM_364_19011717281.pdf)

Student Resources:

- Disability Services (907-474-5655, uaf-disability-services@alaska.edu, Whitaker 208)
- Student Health & Counseling [6 free counseling sessions] (907-474-7043, <https://www.uaf.edu/chc/appointments.php>, Whitaker 203)
- Center for Student Rights and Responsibilities (907-474-7317, uaf-studentrights@alaska.edu, Elelson 110)
- Associated Students of the University of Alaska Fairbanks (ASUAF) or ASUAF Student Government (907-474-7355, asuaf.office@alaska.edu, Wood Center 119)

Nondiscrimination statement: The University of Alaska is an affirmative action/equal opportunity employer and educational institution. The University of Alaska does not discriminate on the basis of race, religion, color, national origin, citizenship, age, sex, physical or mental disability, status as a protected veteran, marital status, changes in marital status, pregnancy, childbirth or related medical conditions, parenthood, sexual orientation, gender identity, political affiliation or belief, genetic information, or other legally protected status. The University's commitment to nondiscrimination, including against sex discrimination, applies to students, employees, and applicants for admission and employment. Contact information, applicable laws, and complaint procedures are included on UA's statement of nondiscrimination available at www.alaska.edu/nondiscrimination. For more information, contact:

UAF Department of Equity and Compliance
1692 Tok Lane, 3rd floor, Constitution Hall, Fairbanks, AK 99775
907-474-7300
uaf-deo@alaska.edu

Additional syllabi statement for courses including off-campus programs and research activities:

University Sponsored Off-Campus Programs and Research Activities

We want you to know that:

1. UA is an AA/EO employer and educational institution and prohibits illegal discrimination against any individual: www.alaska.edu/nondiscrimination.
2. Incidents can be reported to your university's Equity and Compliance office (listed below) or online reporting portal. University of Alaska takes immediate, effective, and appropriate action to respond to reported acts of discrimination and harassment.
3. There are supportive measures available to individuals that may have experienced discrimination.
4. University of Alaska's Board of Regents' Policy & University Regulations (UA BoR P&R) 01.02.020 Nondiscrimination and 01.04 Sex and Gender-Based Discrimination Under Title IX, go to: <http://alaska.edu/bor/policy-regulations/>.
5. UA BoR P&R apply at all university owned or operated sites, university sanctioned events, clinical sites and during all academic or research related travel that are university sponsored.

For further information on your rights and resources [click here](#).

Contact information

Governance Office

Email: acindsoe@alaska.edu

Phone: 907-474-7984

Physical address:

328 Signers' Hall

1810 Sechs Street

Mailing address:

PO Box 757500

Fairbanks, AK 99775



The University of Alaska is a public institution created by the Northern Constitution and Statutes and University Policies.
UAF is an AA/EO employer and educational institution and prohibits illegal discrimination against any individual. Learn more about UA's vision of nondiscrimination.
UAF is committed to providing accessible websites, online resources, and information. Visit alaska.edu for more information.
#NanookNation

For questions or comments regarding this page, contact web@alaska.edu or UA.