

Note: this syllabus is a contract between us. I promise that the exams will be given on the days stated, and that the grading scale will be consistent with the procedure described. In return, you promise to read the syllabus before asking a question about class procedure either face-to-face or by e-mail. **I reserve the right to deduct 5 points from your overall total in the class every time you ask a question for which the answer is on the syllabus.**

Lecture and Exam Schedule

	<u>Week</u>	<u>Chapter</u>	<u>Topic</u>
1	1/14 1/16	1 1	Introduction; The Scientific Method; Chemistry: Methods and Measurements Chemistry: Methods and Measurements
2	1/21 1/23	2 2	The Structure of the Atom and the Periodic Table The Structure of the Atom and the Periodic Table
3	1/28 1/30	2 3	The Structure of the Atom and the Periodic Table Structure and Properties of Ionic and Covalent Compounds
4	2/4 2/6	3	Structure and Properties of Ionic and Covalent Compounds Exam 1 covering Chapters 1–2 and part of Chapter 3
5	2/11 2/13	3 3 4	Structure and Properties of Ionic and Covalent Compounds Structure and Properties of Ionic and Covalent Compounds Calculations and the Chemical Equation
6	2/18 2/20	4 4	Calculations and the Chemical Equation Calculations and the Chemical Equation
7	2/25 2/27	4	Calculations and the Chemical Equation No Lecture; Professorial absence
8	3/4 3/6 3/11-3/13	5	States of Matter: Gases, Liquids, and Solids Exam 2 covering Chapters 1–4 emphasizing Chapters 3–4 No Lectures; Spring Break Holiday
9	3/18 3/20	5 5	States of Matter: Gases, Liquids, and Solids States of Matter: Gases, Liquids, and Solids
10	3/25 3/27	6 6	Solutions Solutions
11	4/1 4/3	6 7	Solutions Energy, Rate, and Equilibrium
12	4/8 4/10	7 8	Energy, Rate, and Equilibrium Exam 3 covering Chapters 1–7 emphasizing Chapters 5–7
13	4/15 4/17	7 8	Energy, Rate, and Equilibrium Acids and Bases and Oxidation-Reduction
14	4/22 4/24	8 8	Acids and Bases and Oxidation-Reduction Acids and Bases and Oxidation-Reduction
15	4/29 5/1	9 9	The Nucleus, Radioactivity, and Nuclear Medicine The Nucleus, Radioactivity, and Nuclear Medicine
16	5/6	6:00–7:50 pm	Exam 4 covering Chapters 1–9 emphasizing Chapters 8–9 Comprehensive Final Exam covering Chapters 1–9

INFORMATION

General Education Course Objectives

- Improve ability to think critically and logically.
- Improve ability to reason quantitatively and to perform basic chemical computations.
- Improve ability to interpret mathematical models.
- Learn how to use the scientific method and theories to understand chemical phenomena.
- Develop an appreciation for the importance of the role of chemistry in everyday life.
- Develop an understanding of the historical development of the field of chemistry.

Content Objectives of Chem 110

- Understand the concepts of matter and energy and become acquainted with metric and SI units of measurement.
- Understand atoms and ions and their subatomic components.
- Learn the electronic structures of atoms and ions, and understand their relationship to periodic properties.
- Correctly predict the shapes of complex molecules and ions from Lewis dot/VSEPR characteristics.
- Learn chemical nomenclature.
- Learn basic stoichiometry calculations.
- Develop the ability to predict outcomes of chemical reactions from knowledge of reactants and reaction types.
- Understand the chemical basis for the physical behavior of gases, liquids, and solids.
- Become knowledgeable about the properties of aqueous solutions.
- Develop the ability to predict reactions and equilibria from knowledge of Le Chatelier's Principle.
- Understand the physicochemical characteristics of acids, bases, oxidants, and reductants.
- Become knowledgeable about nuclear chemistry and its applications to medical fields.

Study Resources

Text: "General, Organic, and Biochemistry, 8th Edition", by Denniston, *et al*; McGraw-Hill (2013). A special paperback version that contains only Chapters 1-9 should be available in addition to the hardcover containing all chapters. A Student Study Guide is available, and many students will find it useful. Recommended for students with marginal math backgrounds are: D. M. Goldish, "Basic Mathematics for Beginning Chemistry", 4th Ed, MacMillan, 1990; D. J. Dahm & E. A. Nelson, "Calculations in Chemistry: An Introduction", W. W. Norton, 2012. Copies of both are available from booksellers; copies of Goldish are on reserve in Faraday Library (Faraday Hall 212). Also available in Faraday Library are many old chemistry texts. These might explain a topic more clearly or provide extra end-of-chapter problems that will help you study for the class. Ask the library staff for help finding them.

Office Hours: I will hold office hours on Tuesdays and Thursdays after lecture until about 8:00 pm. You are welcome to come by without an appointment for class assistance during these times. If you can't make it at these times, you can make an appointment for another time. However, since I have other responsibilities, appointments will be limited. I will answer short, concise questions sent by e-mail, but the turnaround time may not be instantaneous.

Tutoring: The Chemistry Department maintains a tutoring room in Faraday 246 for the benefit of General Chemistry students. It is staffed at irregular intervals; look for the schedule sheets posted around the building and near the tutoring room. Tutoring is free for registered Chem 110 students. Names of tutors who charge for their services are available from Linda Davis in Faraday 319 (the Chemistry Department Office). In addition, the NIU ACCESS program provides further assistance with course material through its Supplemental Instruction (SI) system. Further information on this will be provided when available.

Blackboard: Class documents, such as this syllabus, some lecture material, and exam keys will be posted on Blackboard. Thus, you should make certain you know how to access Blackboard.

Homework: Homework will not be assigned. Solving the problems at the end of each chapter, *with a time limit*, is good practice for the exams, since exam questions will be taken from a test bank associated with the text.

Exams and Grades

There will be three examinations during the semester (100 points each). A fourth exam (100 points) and a comprehensive final examination (100 points) will be given during the final examination period. The exams will consist of 25 multiple-choice questions, and will be scored by Scantron. To minimize tardiness and the potential for cheating, once any student turns in their Scantron and leaves the examination room, no students will be allowed to enter the examination room and begin the exam. Requests for scoring checks must be made within one week from the day the scores are posted on Blackboard.

The final grade for the course will be determined from the following possible point totals:

Best Three Scores of the Four Regular Exams	300
<u>Comprehensive Final Examination</u>	<u>100</u>
Total Possible Points	400

The lowest score of the regular exams will be dropped. This allows you to miss an exam if absolutely necessary, and minimizes the effect of one poor score on the overall grade. Because of this policy, **there will be no makeup exams. Also, no extra credit is available.** The professor will deal with any issues that affect your ability to take exams (such as medical problems or weather closures) on a case-by-case basis. His decision is final.

The faculty of the Department of Chemistry and Biochemistry voted in November 2008 to institute a capped grade point average requirement for Chem 110. This is intended to ensure that different sections of the course require the same levels of competence to earn identical grades. The average GPA in Chem 110 is required to be 1.85 ± 0.15 , or in the range 1.70-2.00. **The average class GPA cannot be above 2.00 or below 1.70.** This means that regardless of excellent class performance, not every student can earn an A or

B, and regardless of poor class performance, not every student can earn a D or F. Your overall grade will depend on your performance vs. that of every other student in the class. The grading scale embodies the **statistical** curve, with most students earning grades of C, some earning Bs and Ds, and a small number earning As and Fs. **There will not be a "high school" curve that corresponds to lowering a scale.** This means it is impossible to determine reliably what your individual exam scores mean in terms of a grade, or what your grade is, before the Final Examination is completed and scored.

One modification to this policy exists, so that students do not inappropriately benefit from other students behaving badly. Students who do not take the comprehensive Final Examination will receive a grade of F for the course, and this grade will not be included when the grade distribution/grade average is calculated.

A **very** approximate percentage scale will be: $\geq 85\%$ (340 points) = A, 80–84.9% (320–339 points) = A-, 77–79.9% (308–319 points) = B+, 73–76.9% (292–307 points) = B, 70–72.9% (280–291 points) = B-, 67–69.9% (268–279 points) = C+, 60–66.9% (240–267 points) = C, 50–59.9% (200–239 points) = D, $<50\%$ (199 points) = F. It must be kept in mind that the average GPA requirement from the Department supersedes this scale, so the grade you receive may not be consistent with it.

Enforcement of the fixed GPA requirement is the responsibility of the Undergraduate Curriculum Committee of the Department of Chemistry and Biochemistry. The Chair of that Committee is Professor David Ballantine, Director of Undergraduate Studies for the Department.

Academic Integrity and Dishonesty

Students are expected to comply with the academic integrity terms described in the Undergraduate Catalog: Academic Regulations: Academic Integrity section. As applied particularly to CHEM 110, academic dishonesty includes, but is not limited to, looking at or copying work from another student's exam during a testing session, allowing another student to copy work, and using unauthorized materials (e.g., lecture notes, crib sheets, textbooks, prohibited electronic devices including pagers, cell phones, headphones, or programmable calculators containing stored equations, formulas, or text) during exams. **CHEATING IN ANY FORM WILL NOT BE TOLERATED.** Violation of any of these terms will result, at minimum, in awarding a score of zero for the assignment in question. Students responsible for, or assisting others in, either cheating or plagiarism on an assignment, quiz, or examination may receive a grade of F for the course involved and may be suspended or dismissed from the university.

NIU provides an online tutorial on academic integrity. Students are encouraged to take the tutorial, at <http://www.niu.edu/ai/students/>.

Attendance

Students are expected to comply with the attendance terms described in the Undergraduate Catalog: Academic Regulations: Attendance section.

Accommodations for Students with Disabilities

NIU abides by Section 504 of the Rehabilitation Act of 1973, which mandates that reasonable accommodations be provided for qualified students with disabilities. A student who believes that reasonable accommodations with respect to course work or other academic requirements may be appropriate in consideration of a disability must (1) provide the required verification of the disability to the Disabilities Resource Center, (2) meet with the DRC to determine appropriate accommodations, and (3) inform the faculty member in charge of the academic activity of the need for accommodation. Students are encouraged to inform faculty of their requests for accommodations as early as possible in the semester, but must make the requests in a timely enough manner for accommodations to be appropriately considered and reviewed by the university. If contacted by the faculty member, the staff of the DRC will provide advice about accommodations that may be indicated in the particular case. Students who make requests for reasonable accommodations are expected to follow the policies and procedures of the DRC in this process.

Students with disabilities can obtain a wide range of services, including housing, transportation, adaptation of printed materials, and advocacy with faculty and staff. Students with disabilities who need such services or want more information should contact the Disabilities Resource Center (4th floor of the University Health Services building) at 815-753-1303.