

CHEM 110, Section 1

Lecturer: T. M. Gilbert

Fall, 2015

Office: LaT (Faraday West) 309

M W 6:00–7:15 PM

Office Phone: 815-753-6896

Faraday Hall 143

E-mail: tgilbert@niu.edu

Lecture and Exam Schedule

	<u>Week</u>	<u>Chapter</u>	<u>Topic</u>
1	8/24 8/26	1 1	Chemistry: Methods and Measurements Chemistry: Methods and Measurements
2	8/31 9/2	2 2	The Structure of the Atom and the Periodic Table The Structure of the Atom and the Periodic Table
3	9/7 9/9	 3	No Lecture; Labor Day Holiday Structure and Properties of Ionic and Covalent Compounds
4	9/14 9/16	3	Structure and Properties of Ionic and Covalent Compounds Exam 1 covering Chapters 1–2
5	9/21 9/23	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	9/28 9/30	4 4	Calculations and the Chemical Equation Calculations and the Chemical Equation
7	10/5 10/7	4 5	Calculations and the Chemical Equation States of Matter: Gases, Liquids, and Solids
8	10/12 10/14	5	States of Matter: Gases, Liquids, and Solids Exam 2 covering Chapters 1–4 emphasizing Chapters 3–4
9	10/19 10/21	5 6	States of Matter: Gases, Liquids, and Solids Solutions
10	10/26 10/28	6 6	Solutions Solutions
11	11/2 11/4	7 7	Energy, Rate, and Equilibrium Energy, Rate, and Equilibrium
12	11/9 11/11	7	Energy, Rate, and Equilibrium Exam 3 covering Chapters 1–7 emphasizing Chapters 5–7
13	11/16 11/18	8 8	Acids and Bases and Oxidation-Reduction Acids and Bases and Oxidation-Reduction
14	11/23 11/25	8	Acids and Bases and Oxidation-Reduction No Lecture; Thanksgiving Holiday
15	11/30 12/2	9 9	The Nucleus, Radioactivity, and Nuclear Medicine The Nucleus, Radioactivity, and Nuclear Medicine
16	12/7 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.
- 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/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 and Online Material: *"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. You must also purchase access to CONNECT/LearnSmart (see below).

Printed Material: A Student Study Guide to Denniston 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).

Office Hours: I will hold office hours on Mondays and Wednesdays after lecture until 8:00 PM. You can stop by without an appointment for class assistance during these times. I am also available by appointment. 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 free tutoring room in Faraday Hall 247 for the benefit of General Chemistry students. It is staffed irregularly; look for schedule sheets posted near the tutoring room, or online (<http://www.chembio.niu.edu/> and follow the links). Names of tutors who charge for their services are available from Linda Davis in Faraday 319 (the Chemistry Department Office).

Supplemental Instruction (SI): The NIU ACCESS program provides further assistance with course material through its Supplemental Instruction (SI) system. If an SI person is available for this section, she/he will offer office hours and help sessions at convenient times, as well as other class assistance at their discretion. Further information on this will be provided when available.

Blackboard: Class documents, such as this syllabus, some lecture material, selected PowerPoint lecture slides, material from the SI person, and exam scores and keys will be posted on Blackboard. Thus, you should make certain you know how to access Blackboard.

Problems in the text: Homework from the text will not be assigned. Instead, you will solve homework problems using CONNECT/LearnSmart (see below). That said, solving the problems at the end of each chapter, *with a time limit*, is excellent practice for the exams. The time limit should be three minutes, since during exams you must solve 25 exam problems in 75 minutes. If you can't solve a problem from the text in three minutes, you should question yourself as to why, and then restudy that section of the material.

Exams, Homework, and Grades

There will be three examinations given during the lecture times within the semester (100 points each; see schedule for dates). 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.

In addition, you are required to study and solve online homework problems using the CONNECT/LearnSmart system. Homework is worth 100 points, and cannot be replaced with an exam score. See page 5 for more information on using CONNECT/LearnSmart.

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

Best Three Scores of the Four Regular Exams	300
Homework	100
<u>Comprehensive Final Examination</u>	<u>100</u>
Total Possible Points	500

The lowest score of the four 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 or extra credit points.** The professor will deal with any issues that affect your ability to take exams (such as medical problems or snow closures) on a case-by-case basis. His decision is final.

An approximate grading scale will be: $\geq 90\%$ (450 points)+ = A, 80–89.9% (400–449 points) = B, 70–79.9% (350–399 points) = C, 60–69.9% (300–349 points) = D, $<60\%$ (≤ 299 points) = F. This scale is approximate because Chem 110 has a grade point average (GPA) floor. The average GPA in Chem 110 cannot be less than 1.70. This means it is impossible to determine precisely what individual exam scores mean in terms of a grade, or what your grade is prior to the final examination. Consequently, you should use the approximate scale to predict your grade throughout the semester. The professor will not answer grade-related questions at any time during the semester.

One modification of the calculation of the GPA exists, so that students do not benefit from other students behaving badly. Grades of F earned by students who do not take any exam past the second one, yet do not drop the class, will not be included when the class GPA is calculated. **For your information:** professors must provide records of last attendance in class to NIU Registration and Records for any student who earns an F in a class. R & R in turn is required by law to provide this information to any agencies that might be providing financial support to the student. Said agencies are in general then required to recoup that financial support from the student, since the student violated the contract requirement of attending class.

Academic Integrity and Dishonesty

Good academic work must be based on honesty. The attempt of any student to present as his or her own work that which he or she has not produced is regarded by the faculty and administration as a serious offense. 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, turning in a paper or an assignment written, in whole or in part, by someone else, and using unauthorized materials (e.g., lecture notes, crib sheets, textbooks, prohibited electronic devices including pagers, cell phones, or programmable calculators containing stored equations, formulas, or text) during exams. Students are responsible for plagiarism, intentional or not, if they copy material from books, magazines, or other sources without identifying and acknowledging those sources, or if they paraphrase ideas from such sources without acknowledging them.

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.

A faculty member has original jurisdiction over any instances of academic misconduct that occur in a course the faculty member is teaching. The student shall be given the opportunity to resolve the matter in meetings with the faculty member and the department chair. If the student does not dispute the facts of the incident, the faculty member may elect to resolve the matter at that level by levying a sanction no greater than an F for that course. The faculty member shall notify the student in writing whenever such action is taken, and the Office of Community Standards and Student Conduct shall receive a copy of the Academic Misconduct Incident Report indicating final disposition of the case, which will be placed in the student's judicial file. In all matters where the charge of academic misconduct is disputed by the student, or if the faculty member feels a sanction greater than an F in the course is appropriate (such as repeated offenses or flagrant violations), the faculty member shall refer the matter to the Office of Community Standards and Student Conduct, making use of the Academic Misconduct Incident Report. Additional sanctions greater than an F in a course can be levied only through the University Judicial System. With regards to finding the student either responsible or not responsible for his or her action, the ruling of the Judicial Hearing Board shall be binding. In cases where there is either a finding of responsibility or an admission of responsibility by the student, any recommendations by the hearing board regarding the course grade are non-binding on the instructor, who remains solely responsible for assigning a course grade, consistent with the policies set forth in the course syllabus.

Attendance

The university does not use a "cut" system. Each instructor decides whether to excuse class absences and determines how to permit make-up work. If a student will be absent from classes for a week or more because of an accident, illness, or other emergency, instructors will be notified of the absence only if students or their parents request it through the Division of Student Affairs. Health Services will not release information about students unless they provide a written request.

Leaves of absence will be granted for volunteer services related to disaster relief in accordance with applicable Illinois statutes or executive orders issued by the State of Illinois in response to emergency situations. To initiate a leave of absence, students should contact their College Dean's office, or the vice provost (or the vice provost's delegate) for any student who has no college affiliation. Following the period of volunteer service, Registration and Records will facilitate reenrollment of the student.

Students are expected to comply with each individual instructor's established attendance policy. Students should avoid registering for classes in which they would amass significant absences. In the case of an absence due to required attendance at a university-sponsored event such as a department trip, performing arts activity, ROTC function, or athletic competition, reasonable attempts shall be made by faculty members to allow the student to make up missed work. Students are responsible for completing the work assigned and/or due on the days they are absent for university-sponsored events. Both the sponsoring unit and the student should inform the faculty member as soon as possible in the semester in order for arrangements to be made for completing missed assignments, examinations or other required course work. The student is required to provide each instructor with an official notification in advance of the absence (e.g., a letter from the chair of the sponsoring department, the head of the sponsoring unit, or the coach).

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.

McGraw Hill On-Line Resources: CONNECT Plus (CONNECT) and LearnSmart

Note: CONNECT and LearnSmart cannot be accessed through smart phones and iPads; you must use a computer.

Note 2: Experience has shown that accessing CONNECT/LearnSmart through BlackBoard works far better than accessing them directly through the MHHE website. In particular, scores often do not transfer to Grade Center properly unless CONNECT/LearnSmart was accessed through BlackBoard. **I recommend in the strongest terms that you access CONNECT/LearnSmart through BlackBoard.**

Grading in CHEM 110 includes 100 homework points based on performance using on-line instructional technologies. CONNECT Plus and LearnSmart are products that are linked to the McGraw Hill textbook, and you must register for these components using the access codes purchased separately or combined with the required textbook. These on-line components are described here, along with the relative weights assigned to each component.

LearnSmart

LearnSmart is an adaptive learning technology that uses student responses to evaluate mastery of content, and tailors tutorial-style learning sessions to help students increase proficiency. Once students have demonstrated mastery of a given concept, it introduces more advanced concepts until the student has achieved a given level of competence with the content. If the program identifies an area in which the student requires additional practice, it will provide links and/or references to specific sections in the textbook so the student can do additional reading, *etc.*

The LearnSmart modules on Blackboard are correlated with the content of individual lectures, and students are expected to read the appropriate sections and complete the LearnSmart module *before* lecture! For example, according to the schedule we begin Chapter 3 during the third week of class, beginning with sections 3.1 and 3.2. Each student would be expected to read those sections and complete the LearnSmart module tied to those sections before coming to lecture. This allows the instructor to evaluate which concepts in those sections appeared to pose more difficulty for students, and to focus their lectures to provide additional practice with or discussion on those topics.

There are 17 LearnSmart modules on Blackboard, with due dates tied to the lecture schedule described above. The average score on the LearnSmart modules will constitute 25% of the 100 pts for Homework in the grading scheme.

CONNECT

CONNECT is an on-line homework package that is intended to provide students with additional practice working with concepts. Although performance on the homework is part of the overall grade, it is also a useful self-assessment tool. If, while working on a given homework module, you discover that you are having difficulty with a particular concept or problem, you should use that as a guide in preparing for the exams. Try additional problems until you are confident of your abilities, or seek additional help as needed before the next exam.

Homework problems are assigned using either pooled sets of questions or algorithmic questions that will vary data so that two students are unlikely to receive the same set of problems. A student may attempt the homework assignment multiple times (maximum of three attempts) and the highest score achieved before the due date will be recorded. **DO NOT WAIT UNTIL THE HOUR BEFORE THE DUE DATE TO BEGIN THE HOMEWORK.** This is a recipe for failure. Rather, begin the homework assignments as close as possible to the dates when the corresponding material is covered in lecture so that it is fresh in your mind, and so you have time to seek help if needed before the assignment is due.

There are 17 CONNECT homework assignments, and the overall average on the homework will constitute 75% of the 100 pts for Homework in the grading scheme.