



Chemistry 1210: General Chemistry I
Summer 2010

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Virtual Class Meetings. Mondays and Wednesdays, 2:00-3:30 MDT. The first class is Monday, May 17, and the last is Wednesday, August 4.

Office hours. TBA

Introduction. The University of Utah is a Tier 1 research university and is the flagship institution of the Utah State System of Higher Education. The Department of Chemistry at the University of Utah annually ranks among the top chemistry departments in the United States with respect to both undergraduate and graduate programs, and its faculty boasts scores of university, national and international awards for teaching as well as for research. In practical terms for you, this means that the University of Utah is widely recognized for its excellence, the education you can get from this online chemistry course is first-rate, and you should have no trouble transferring credit earned in this course to your home institution. Check with your home school's registrar about the compatibility of the University of Utah's CHEM 1210, General Chemistry I, with your particular degree requirements.

This is the first semester of general chemistry for science majors, engineering majors, and students of all disciplines who plan to pursue professional degrees in medicine, dentistry, and pharmacy. In this course, you will study the fundamentals of atomic and molecular structure, reaction stoichiometry, chemical reactions in aqueous solution, gas laws, thermochemistry, quantum theory, periodic properties of the elements, chemical bonding theories, properties of condensed phases, and physical properties of solutions.

This is a lecture course only and has no laboratory component. Depending on your program/degree requirements, you may need to take the accompanying laboratory course on campus at Utah or at your home institution.

Prerequisites. College Algebra (University of Utah MATH 1050) is a prerequisite for this course, but more generally, actual competence in algebra is a prerequisite. Prior coursework in chemistry is recommended but not required.

Objectives. Your main goal in this course is to develop a good knowledge base in chemistry. That knowledge base will be centered on the molecular nature of matter, the connections of chemistry to other fields of study, and a logical approach to solving quantitative problems.

We will study Chapters 1-12 from *Chemistry: A Molecular Approach* by Nivaldo Tro in detail. Any excluded sections from these chapters will be announced. Otherwise, you are responsible for



everything, and you are also responsible for everything mentioned in lecture, whether that material is covered by The Book or not.

Course philosophy and structure. How does one learn chemistry through an online course? The same good habits in a regular course will lead to success in an online course: carefully reading the textbook, attending class meetings, diligently working through homework problems, asking questions, and keeping up with the material. Poor habits in a regular course are magnified in a virtual environment, as it is much easier to put off homework and studying if one chooses to be little more than a name on a monitor screen. Success in this course demands consistent, careful study and critical thinking rather than memorization.

Class meetings for this course will not be so different from class meetings in person. Twice each week and in real time, you will listen as I explain chemistry concepts and strategies for solving problems, watch me write on the board and present prepared slides, and have the opportunity to ask questions. The only real difference is that we will not be physically in the same room. Likewise, a teaching assistant (TA) will run discussion sessions in which you will have the opportunity to ask questions and practice solving problems while working with classmates in small groups.

Your primary resource for the course, including all materials and important links, is Utah's WebCT/Blackboard site (<http://webct.utah.edu>). Your uNID (University Network ID) and password is required for access to this site.

Most of the grading for this course centers on your use of PracticeZone.org, an online quiz, homework, and exam resource developed by Charles Wight, professor of chemistry and Dean of the Graduate School at the University of Utah.

Weekly Quizzes. The first part of learning a subject well is knowing something about that subject before listening to the professor discuss it. To that end, 10% of your course grade is based on quizzes you will take *before* we begin a new subject. You will need to create a new account (at no charge!) at <http://practicezone.org> and join the group for this course (Owens, Greg – U. of Utah CHEM 1210-090 (online)). You will find the full rules, including the fact that you can take a single quiz as many times as you like, on the website, but the short and sweet of it is that these quizzes are not meant to be difficult. The only reason for one not to get a perfect score (likely after a few attempts) is not to take the quiz before the deadline. Use your text (*Chemistry: A Molecular Approach* by Tro is our course text, but any good general chemistry text will do.) to find the answers and read about the science before our class meetings. Due dates will be posted on the WebCT calendar and on the PracticeZone website.

Instructor Presentations. The second part of learning a subject well involves keeping up with the material. Class presentations are conducted twice a week by videoconference using Wimba. You can find the link to your Wimba virtual classroom in the WebCT/Blackboard site. Each presentation will be recorded and archived for your use afterward. Please realize right away that this amounts to a doubled-edged sword. While you have the flexibility of “attending” class whenever you want, that flexibility also comes with enormous responsibility. Do not fall into the trap of putting off your work for this class until the last minute. If you keep up with the class and work hard on a consistent basis, you will fare far better than one who tries to cram massive amounts of information at the last second.



Discussion Sections. Virtual discussions for this course meet on Tuesdays and Thursdays. The TA for this course has a wealth of experience in teaching general chemistry and is an extremely valuable resource for you. Take advantage of the discussion boards on WebCT to interact with your peers and help each other learn chemistry. In a virtual environment such as this, the easiest course of action is passivity, but merely watching passively and not asking questions when you do not understand something is the sure path to a marginal or failing grade. Get involved. Ask questions.

Homework Exercises. The final part of learning a subject well concerns your work after class meetings. Reading about chemistry, answering simple quiz questions, and listening to class presentations are great ways to learn the basics, but the real meat of any worthwhile chemistry course is solving problems. Spending good time working homework problems is a critical component of your chemistry studies, for the majority of your exam questions will be problems to solve. You will use PracticeZone to work through relevant homework problems. The online homework counts for 10% of your overall grade. Due dates will be posted on the WebCT calendar and on the PracticeZone website. If you feel that you need additional practice beyond the required homework problems on PracticeZone, keep in mind that each chapter of the Tro textbook contains ~100 end-of-chapter problems for you to work.

Midterm Exams. There will be three midterm exams due during the summer term. The exams are taken through the PracticeZone site and consist of a mix of quiz questions and homework problems. Like the quiz and homework assignments, you may take each midterm multiple times as often as you wish to improve your scores prior to the deadline. PracticeZone sorts your scores by topic, and it tracks your cumulative exam scores for all topics simultaneously. Keep working at it until you are satisfied with the scores on topics covered by each test. Each of the three midterm exams is worth 10% of your overall grade.

Final Exam. The final exam for the course is a comprehensive proctored exam taken with pen and paper. You will be given instructions on how to arrange for a proctor in your area. The proctored final exam is a required assignment. You cannot receive a passing grade without taking it. For your final exam, you will need a pen and a non-programmable scientific calculator (i.e. one with scientific notation, logarithms, and antilogarithms). Nothing else (e.g. cell phones, PDA's, laptops, electronic translators, whatever) will be permitted. The final exam accounts for 50% of your overall grade.

Academic Integrity. *Everything* done through PracticeZone is to be considered as independent work. You are encouraged to interact with your classmates throughout this course, and you are welcome to discuss the course material and strategies for solving homework problems. However, all the answers you submit for PracticeZone quizzes, homework, and exams should be your own.



Tentative Class Schedule

May 17	Ch. 2: atomic structure, atomic masses
May 19	Ch. 3: kinds of compounds, molar masses
May 24	Ch. 3: empirical and molecular formulas
May 26	Ch. 4: reaction stoichiometry
May 31	Memorial Day—no class
June 2	Ch. 4: aqueous reactions
June 4	exam 1
June 7	Ch. 5: gases
June 9	Ch. 5: kinetic molecular theory
June 14	Ch. 6: work and heat
June 16	Ch. 6: enthalpy changes
June 21	Ch. 7: quantum theory
June 23	Ch. 7: orbitals
June 25	exam 2
June 28	Ch. 8: electron configurations
June 30	Ch. 8: periodic properties
July 5	Independence Day holiday—no class
July 7	Ch. 9: lattice energy, Lewis structures
July 12	Ch. 9: Lewis structures, bond energies
July 14	Ch. 10: geometry, polarity



July 16	exam 3
July 19	Ch. 10: hybridization, molecular orbital theory
July 21	Ch. 11: intermolecular forces, vapor pressure
July 26	Ch. 11: phase diagrams, solids
July 28	Ch. 12: properties of solutions
August 2	Ch. 12: colligative properties
August 4	final Q&A
August 6	final exam