

Chem 100: Chemical Science

Online Course Design: Background Research

Updated: 12/12/08



College of Letters & Science

Course Description: Introductory course in general inorganic chemistry designed for the student with little or no previous science training.

Topics:

Algebra review & Measurements	Chemical bonding	Solutions and Chemical
Atoms and Atomic Masses	Intermolecular forces	Reactions
Electronic configurations	The Mole and Formula	Stoichiometry
Hund's rule	Calculations	Gases

Recent Instructors: Anja Blecking, Kristen Murphy, John Picione, Gloria Freschl, Charles Allen, Michael DuPrey, Michael Nasse

Current Online Courses:

- Carnegie Mellon's Open Learning Initiative (OLI) Chemistry course & lab: <http://www.cmu.edu/oli/courses/chemistry/>
 - A complete stoichiometry course demonstrating a scenario-based approach to teaching chemistry.
- MIT's "Principles of Chemical Science": <http://ocw.mit.edu/OcwWeb/Chemistry/5-111Fall-2005/CourseHome/>
 - An introductory chemistry course, emphasizing basic principles of atomic and molecular electronic structure, thermodynamics, acid-base and redox equilibria, chemical kinetics, and catalysis.
- Rice University's "General Chemistry I": <http://cnx.org/content/col10263/latest/>
 - Concepts associated with the first half of a two-semester Chemistry course at Rice University.

Available Learning Objects:

- Carnegie Mellon's "ChemCollective" tutorials, activities, and virtual labs: <http://www.chemcollective.org/>
 - A collection of virtual labs, scenario-based learning activities, and concepts tests which can be incorporated into a variety of teaching approaches.
- University of Arizona's "Flash Interactive Digital Overheads": <http://www.chem.arizona.edu/chemt/ido.html>
 - A collection of tools and animations depicting atomic, molecular, and chemical principles.
- MIT's "Digital Lab Techniques Manual": <http://ocw.mit.edu/ans7870/resources/chemvideo/index.htm>
 - A series of videos designed to help you prepare for your chemistry laboratory class.
- Frostburg State University's "General Chemistry Online!": <http://antoine.frostburg.edu/chem/senese/101/index.shtml>
 - Comprehensive resource including tools, tutorials, glossary, simulations, and practice exams.
- UC-Berkeley's "General Chemistry" video lectures: http://webcast.berkeley.edu/course_details_new.php?seriesid=2008-D-11003&semesterid=2008-D
 - Streaming video and audio lectures from Berkeley's Fall 2008 'General Chemistry' course.
- Berkeley's "ChemConnections": <http://mc2.cchem.berkeley.edu/>
 - Learning modules designed to foster an appreciation and understanding of chemistry.

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- Ohio State's "Interactive Chemistry Tutorials": <http://chemunder.chemistry.ohio-state.edu/under/chemed/chemed.htm>
 - Quizzes and tutorials on a variety of chemistry topics.
- McGraw-Hill's "Essential Chemistry" Flash animations: <http://www.mhhe.com/physsci/chemistry/essentialchemistry/flash/flash.mhtml>
 - Flash animations designed along with MH's "Essential Chemistry, 2/e" book.
- University of Maryland's "The World of Chemistry": <http://www.learner.org/resources/series61.html>
 - A video instructional series for college and high school classrooms and adult learners; 26 half-hour video programs and coordinated books.
- UC-San Diego's "Basic Chemistry" audio lectures: <http://podcast.ucsd.edu/podcasts/default.aspx?PodcastId=228>
 - Streaming webcasts of 30 lectures from an introductory chemistry course.
- Western Kentucky University's "Chemistry" lecture podcasts: <http://blog.wku.edu/podcasts/index.php>
 - Streaming audio and video lectures covering basic topics in chemistry.
- Iowa State University's "Conceptual Computer Animations for General Chemistry": <http://www.chem.iastate.edu/group/Greenbowe/sections/projectfolder/animationsindex.htm>
 - Chemistry experiment simulations, tutorials and animations for Introduction to college chemistry.
- New Jersey Institute of Technology's "The Science of Chemistry": <http://njcmr.njit.edu/distils/lab/scism.html>
 - Text and images illustrating many introductory chemistry concepts.
- University of Windsor's "Physical Chemistry Animations": <http://mutuslab.cs.uwindsor.ca/schurko/animations/>
 - Java and Shockwave animations of basic chemistry concepts.
- UNC-Chapel Hill's "Chemistry Fundamentals Program": <http://www.shodor.org/unchem/>
 - An interactive educational exercise for use with UNC's basic chemistry course.
- An Introduction to Chemistry Shockwave animations: http://preparatorychemistry.com/Bishop_animations.htm
 - The following links take you to Shockwave animations that illustrate many of the topics in the two versions of *An Introduction to Chemistry* by Mark Bishop.
- University of Illinois at Urbana-Champaign's "NCSA ChemViz": <http://education.ncsa.uiuc.edu/products/chemviz/index.html>
 - ChemViz (Chemistry Visualization) is an interactive chemistry program which incorporates computational chemistry simulations and visualizations for use in the chemistry classroom.
- Sam Houston State University's "Chemistry-Based QuickTime Movies, Animations, and Streaming Audio": http://www.shsu.edu/~chm_tgc/sounds/sound.html
 - Collection of learning objects dealing with various chemistry principles.

Relevant Textbooks with Supplementary Digital Materials:

- "Introductory Chemistry: An Active Learning Approach, 3rd Edition": http://www.brookscole.com/cgi-wadsworth/course_products_wp.pl?fid=M20b1&flag=instructor&product_isbn_issn=9780495013327&disciplinenummer=12

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- "Chemistry for Changing Times, 11th Edition":
http://www.pearsonhighered.com/educator/academic/product/0,,0132280841,00%2ben-USS_01DBC.html#elearning
- "Introductory Chemistry: A Foundation, 6th Edition":
http://college.cengage.com/chemistry/intro/zumdahl/intro_chemistry/6e/ins_resources.html
- "Descriptive Inorganic Chemistry, 4th Edition":
<http://www.whfreeman.com/newcatalog.aspx?isbn=0716762099&detail=features>
- "An Introduction to Chemistry, 1st Edition":
http://preparatorychemistry.com/Bishop_Chemistry_First.htm (full text)