I. Course Overview

Basic information
Department: Chemistry
Course Prefixes: CHM104, Section 40528
Course Title: Introduction to Chemical Principles
Credit Hours: 4

Instructor’s information
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Catalog course description
Study principles of general chemistry. Prepares students for CHM201. Recommended preparation: high school algebra and chemistry. Satisfies the university general education requirement in natural science and technology. Prerequisite: MTH011 with minimum grade of 2.0 or placement in MTH012 or higher MTH course; or CHM090.

CHM 104 is the first semester of a one-year course in general, organic and biological chemistry. The topics covered are matter, energy, chemical formulas, measurements, metric system, periodic table, atomic theory and structure, bonding, chemical reactions and equations, stoichiometry, solutions, acid/base theories, equilibrium, gas laws, and nuclear chemistry. This course is intended for the student who needs fundamental college chemistry, or those students who need preparation for CHM 201. This course is not intended for chemistry majors, premed, etc.

Required text

Virtual ChemLab: Available in the MediaPak, can be run directly from the CD or Installed on the student's computer.
Other: Scantron forms NO. F-1712-PAR-L, and Scientific calculator (The only calculators that are allowed for exams are the TI-30X or TI-30X Solar scientific calculators).


You also need to purchase an access code which will allow you to browse the course pack materials and quizzes. The book and the access code are available at OU bookstore.

II. Course Goals and Objectives
CHM104 satisfies the university general education requirement in natural science and technology (NST). The learning outcomes for NST courses states that the student will demonstrate:

- knowledge of major concepts from natural science or technology, including developing and testing of hypotheses; drawing conclusions; and reporting of findings through some laboratory experience or an effective substitute (Laboratory experiences are met by either a limited number of interactive experiences, collecting and interpreting raw data, or other effective experiences such as a virtual laboratory)
- how to evaluate sources of information in science or technology

Learning Outcomes
You will also be able to perform the following:

1. Solve problems involving direct proportionality
2. Use both English and Metric units of measure
3. Use the periodic table to predict bonding and molecular geometry
4. Organize, balance and predict products for chemical equations
5. Understand differences among solids, liquids and gases and the forces holding them together
6. Solve problems related to all Gas Laws
7. Solve problems related to molar ratios
8. Determine the correct electron configuration of an atomic species.
10. Name various ionic and covalent compounds
11. Identify the various types of chemical reactions; predict reaction rates, equilibrium and pH
12. Predict products of nuclear reactions
13. Perform experiments that apply knowledge above.

The cross-cutting capacity covered is critical thinking.

III. Course Policies and Procedures
Web site
There is a web site for this course at Moodle. You will be required to use the site to check for the latest news, announcements, class assignments, course syllabus, and grades. To login into Moodle, you will use your OU email I.D. and password.
**Course materials**
The course will be divided into two sections.

*Section I, which include the following chapters:*

- Chapter 1  Matter, Energy, and Life
- Chapter 2  Measurements in chemistry
- Chapter 3  Atoms and the periodic table
- Chapter 4  Ionic compounds
- Chapter 5  Molecular compounds
- Chapter 6  Chemical reactions: Mass relationships and classification
- Virtual Chemistry Labs  VCL-1, VCL-2, VCL-3, VCL-4, VCL-6

*Section II, which include the following chapters:*

- Chapter 7  Chemical reactions: Energy, rates, and equilibrium
- Chapter 8  Gases, Liquids, and Solids
- Chapter 9  Solutions
- Chapter 10  Acids, Bases, and Salts
- Chapter 11  Nuclear chemistry
- Virtual Chemistry Labs  VCL-7, VCL-8, VCL-9, VCL-10, VCL-11

**Laboratory Experiences**
There will be laboratory experiences required for this course. We will be utilizing the virtual laboratory experience. This virtual laboratory is a realistic, simulated laboratory environment where you can get a feel for what to expect in a real wet lab. You may experiment on your own in the full virtual lab environment, or choose pre-arranged labs that are referenced in the workbook and at the end of the chapter in the textbook. Virtual ChemLab, available in the MediaPak, can be run directly from the CD or installed on the student's computer.

There are **10** graded virtual labs required for this course (see grading):
VCL1-1, VCL2-(1-4), VCL3-(1-5), VCL4-1, VCL6-(1-9), VCL7-(1-8), VCL8-(1-8), VCL9-(1-6), VCL10-(1-6), VCL11-1.

**Homework assignments**
Homework assignments are ALL the even problems at the end of each assigned chapter, including Understanding Key Concepts and Additional Problems. **You are strongly recommended to do all the homework problems!** This is necessary to become proficient in the material. Homework will be graded as 2 points per chapter.

**Grading and Examinations**
There will be a mid-term and a final multiple-choice exams, laboratory experiences and homework assignments.

The graded work will be:
Mid-term exam 100 points
Examinations are based on material covered in the textbook. Exams will consist of multiple-choice questions.

No make-up exams are given. Should you miss an exam for non-legitimate reasons, you will receive a grade of zero on the missed examination. If you missed an exam for a legitimate reason, we can negotiate.

Section I virtual labs and homework are due on the day of the mid-term exam. Section II virtual labs and homework are due on the day of the final exam.

The maximum number of points that any student can accumulate is 366 points. Final numeric grades will be based on the highest score in the class, which will be assigned a 4.0 grade. Grades will be calculated using the following formula: student’s total points divided by the highest number of points earned out of the whole class multiplied by 4. Obviously, the highest number of points cannot be determined until the end of the semester. To monitor your progress in the class, please use the highest number of points possible for each exam. Personal grades are not available by e-mail but are available on Moodle.

**Office hours**
Office hours are tentatively scheduled every Saturday from 10:00 to 11:00 AM throughout the course. You are requested to log-in to the chat forum during those hours for questions. Office hours time and duration might change dependent on our need.

**IV Timetable**
Mid-term Exam: is scheduled for first Saturday during mid-term exam period **to be announced** from 10:00 am to 1:00 pm in room **(to be announced)**

Final Exam: is scheduled for first Saturday during final exam period **to be announced** from 10:00 am to 1:00 pm in room **(to be announced)**