

Syllabus for
CHE 111--General Chemistry I Lecture
3 Credit Hours
Spring 2009

I. COURSE DESCRIPTION

An introduction to the concepts of chemical bonding, electronic configurations, periodic trends, solution properties, chemical problem solving, and physical properties of gases. Teaches naming of inorganic ions and covalent molecules and dimensional analysis.

Prerequisite: One year of high school chemistry or permission.

Corequisite: CHE 111 Lab.

The teaching method in this course is primarily lecture. The major topics discussed are dimensional analysis, atomic structure, states and properties of matter, nomenclature, stoichiometry, solutions, and bond formation. The course explains the facets of chemistry, their interrelationships, and how they relate to everyday life.

II. COURSE GOALS

This first-semester course is designed to lay the background for succeeding courses in chemistry. The course is relevant for any student who wishes to gain an appreciation for the processes and discipline of a basic science. The course is designed to help the student do the following:

- A. Develop good study habits.
- B. Learn to perform the appropriate mathematical operations in the different topics of chemistry.
- C. Understand and use the basic concepts of chemistry and be able to apply these concepts to more in-depth studies and in different sequences. *(Subj. Comp. 7.c.1 and 7.c.5)
- D. Prepare for a position in one of many fields such as chemical industry, agriculture, textiles, nutrition, or medicine.

*Parenthetical information for Professional Education Students **only**.

III. STUDENT LEARNING OUTCOMES FOR THIS COURSE

A. Terminal Objectives

As a result of successfully completing this course, the student will be able to do the following:

- 1. Discuss dimensional analysis and work problems dealing with unit conversions in stoichiometry, gas laws, and thermochemistry.
- 2. Write and balance chemical equations. *(SC. 7.c.6 and 7.c.7)
- 3. Discuss atomic structure, quantum numbers, electronic configurations, and chemical bonding. *(SC 7.c.4)
- 4. Draw Lewis structures and determine molecular shapes.

*Parenthetical information for Professional Education Program Students **only**.

B. Objectives for Students in Teacher Preparation Programs

The Teacher Preparation Program meets the competency-based requirements established by the Oklahoma Commission on Teacher Preparation. This course meets the following competencies: Subject Competencies (SC)

This course is designed to help students meet subject competencies:

- 7.c.1** Is able to teach with broad understanding of all content areas and understands the interaction between the sciences and process skills as it applies to Physical Science Content: properties and changes of properties in matter.
- 7.c.4** Is able to teach with broad understanding of all content areas and understands the interaction between the sciences and process skills as it applies to Physical Science Content: the structure of atoms.
- 7.c.5** Is able to teach with broad understanding of all content areas and understands the interaction between the sciences and process skills as it applies to Physical Science Content: structure and properties of matter.
- 7.c.6** Is able to teach with broad understanding of all content areas and understands the interaction between the sciences and process skills as it applies to Physical Science Content: chemical reactions.
- 7.c.7** Is able to teach with broad understanding of all content areas and understands the interaction between the sciences and process skills as it applies to Physical Science Content: conservation of energy.

IV. TEXTBOOKS AND OTHER LEARNING RESOURCES

A. Required Materials

Textbooks

Whitten, Kenneth W., Raymond Davis, and M. Larry Peck. General Chemistry, 8th edition. Belmont: Brooks/Cole – Thomson Learning, 2007.

B. Optional Materials

Kenney-Kennicutt, Wendy, and Yi-Noo Tang. General Chemistry, 7th edition, Student Solutions Manual. Belmont: Brooks/Cole – Thomson Learning, 2004.

Scientific Calculator and Periodic Table

V. POLICIES AND PROCEDURES

A. University Policies and Procedures

1. Attendance at each class or laboratory is mandatory at Oral Roberts University. Excessive absences can reduce a student's grade or deny credit for the course.
2. Students taking a late exam because of an unauthorized absence are charged a late exam fee.
3. Students and faculty at Oral Roberts University must adhere to all laws addressing the ethical use of others' materials, whether it is in the form of print, video, multimedia, or computer software. By submitting an assignment in any form, the student gives permission for the assignment to be checked for plagiarism, either by submitting the work for electronic verification or by other means.

4. Final exams cannot be given before their scheduled times. Students need to check the final exam schedule before planning return flights or other events at the end of the semester.
 5. Students are to be in compliance with University, school, and departmental policies regarding ePortfolio requirements. Students should consult the ePortfolio handbooks for requirements regarding general education and the students' majors.
 - a. The penalty for not submitting electronically or for incorrectly submitting an ePortfolio artifact is a zero for that assignment.
 - b. By submitting an assignment, the student gives permission for the assignment to be assessed electronically.
- B. School and/or Department Policies and Procedures
1. The Department of Chemistry adheres to the Assessment policy concerning plagiarism as described in the University Catalog p, "Written assignments using sources must demonstrate ethical and accurate use of source material. Plagiarism and any unethical or inappropriate use of sources will not be tolerated."
 2. The following assessment actions will be taken in the event of documented instances of plagiarism on written assignments, copying of homework assignments, or cheating during examinations:
 - a. An automatic zero will be given for the assignment or exam.
 - b. The original assignment or exam will be kept in the student file and a copy will be given to the student. This could have a negative impact on letters of reference and admission to graduate schools and other postgraduate programs.
 - c. The Department will take repeated offences as grounds for further action.
 3. Any ePortfolio activity required in this course must be completed and assessed prior to the end of the semester to receive course credit; otherwise the assignment will receive a grade of zero.
- C. Course Policies and Procedures
1. Evaluation Procedures
 - a. **Examinations-60% of the course grade**
There are four hourly exams, each covering a specific amount of course material. The exams include information from the lecture notes, quizzes, and homework assignments.
 - b. **Daily quizzes-15% of the course grade**
Quizzes are given in each class during the **first five minutes** of class. They are each worth five points, and are graded for content. Of the five points on each quiz, one point is assigned for the student's name appearing on the paper for the purpose of class attendance. The purpose of daily quizzes is to encourage continual review of course material and to encourage being **on time** for **each** class. Forty quizzes are given during the semester (which equal 200 points). There are six days built in when there is not a quiz, such as an exam day or class days during a revival. Being prompt and having good attendance will automatically improve a student's grade.
 - c. **Weekly homework-10% of the course grade**
Homework assignments are due almost every Monday, unless otherwise specified due to changes in the course calendar. Each assignment ranges

in worth from 10 - 30 points. Homework is practice for answering the types of questions on the course exams and quizzes.

d. **Final Exam-15% of the course grade**

The final exam is either a standardized American Chemical Society final or a comprehensive exam written by the instructor. This exam for the first semester general chemistry course and is given during final exam week according to the university final exam schedule.

2. ePortfolio Requirements

General Education ePortfolio:

The CHE 111 laboratory component for this course has a General Education ePortfolio assignment but not the lecture course.

Department of Chemistry ePortfolio (CHE or BMC majors only):

No Department of Chemistry ePortfolio assignment is required.

3. Other Policies and /or Procedures

- a. The daily quizzes serve as the attendance record. If a student is tardy but arrives to the classroom **before** the quiz papers are collected, he or she may turn in a blank sheet of paper **with his or her name on it** worth one point on the quiz. If a student is tardy, it is the same as being absent that day from class. (unless there is a valid reason for being late, and this matter should be cleared with the instructor immediately after the class)
- b. General Chemistry is not an easy course. However, with quality study time, the material can be assimilated into a usable body of knowledge that will be the basis for future courses in chemistry. Each student should spend two to three hours studying for each hour of lecture. To achieve maximum results, the students should do the following:
 1. Read ahead. Each lecture covers approximately eight to ten pages of text.
 2. Complete the assigned homework problems on time and make the effort to correct any mistakes so they will not be repeated.
 3. Formulate questions over unclear material and plan to see the instructor or a tutor regularly for answers (lab time is a good opportunity to get help on lecture material).
- c. The lecturer, lab instructor, and tutors are eager to assist students with their problems. Students should not hesitate to ask.
- d. **Do not attempt to cram for exams!** Each chapter builds on the previous chapters, so students should make every effort to avoid getting behind.

VI. COURSE CALENDAR

WEEK	TOPIC*	ASSIGNMENT
1	Matter and Units	Ch. 1
2	Atoms, Nomenclature, Molecules	Ch. 2
		Ch. 4 (sections 5-6)
3	Mass Relationships	Ch. 2
4	Chemical Reactions and Solutions	Ch. 4 (sections 1-4, 7-12)
5	Structure of Atoms	Ch. 5
6	Structure of Atoms	Ch. 5
7	Chemical Periodicity	Ch. 6
8	Chemical Equations and Stoichiometry	Ch. 3
9	Stoichiometry	Ch. 3
10	Chemical Bonding	Ch. 7
11	Chemical Bonding	Ch. 7
12	Molecular Structure	Ch. 8
	Bonding Theories	
13	Gases	Ch. 12
14	Gases	Ch. 12
	Intermolecular Forces	Ch. 13
15	Liquids	Ch. 13
16	Final Examination Week	

* Any change in the topics listed above and or sequence of topics listed will be communicated with students in class by the instructor.

Course Inventory for ORU's Student Learning Outcomes

CHE 111 General Chemistry I Lecture Spring 2009

This course contributes to the ORU student learning outcomes as indicated below:

Significant Contribution – Addresses the outcome directly and includes targeted assessment.

Moderate Contribution – Addresses the outcome directly or indirectly and includes some assessment.

Minimal Contribution – Addresses the outcome indirectly and includes little or no assessment.

No Contribution – Does not address the outcome.

The Student Learning Glossary at <http://ir.oru.edu/doc/glossary.pdf> defines each outcome and each of the proficiencies/capacities.

OUTCOMES & Proficiencies/Capacities		Significant Contribution	Moderate Contribution	Minimal Contribution	No Contribution
1	Outcome #1 – Spiritually Alive Proficiencies/Capacities				
1A	Biblical knowledge		X		
1B	Sensitivity to the Holy Spirit			X	
1C	Evangelistic capability				X
1D	Ethical behavior			X	
2	Outcome #2 – Intellectually Alert Proficiencies/Capacities				
2A	Critical thinking	X			
2B	Information literacy			X	
2C	Global & historical perspectives		X		
2D	Aesthetic appreciation			X	
2E	Intellectual creativity		X		
3	Outcome #3 – Physically Disciplined Proficiencies/Capacities				
3A	Healthy lifestyle			X	
3B	Physically disciplined lifestyle			X	
4	Outcome #4 – Socially Adept Proficiencies/Capacities				
4A	Communication skills		X		
4B	Interpersonal skills			X	
4C	Appreciation of cultural & linguistic differences			X	
4D	Responsible citizenship			X	
4E	Leadership capacity			X	