

Syllabus for
CHE 111-General Chemistry I Lecture
3.0 credit hours
Spring 2018

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 based on placement test.

Corequisite: CHE 111 Lab.

II. COURSE GOALS

The teaching method in this course is primarily lecture, but will include some group effort to solve sample problems, participating in class as either individuals or small groups and by responding to questions through the use of clickers. 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.

This 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. Cultivate good work habits by utilizing the available resources such as applied problems at the end of chapters, completing LearnSmart online tutoring, using other available online resources, finishing assigned work, and participating in class by answering questions through the use of clickers.
- B. Learn to perform mathematical operations such as: isolating unknowns in a general equation, solving dimensional analysis problems, and working gas law and vapor pressure problems.
- C. Comprehend and apply fundamental chemical concepts such as: dimensional analysis, nomenclature, stoichiometry, chemical bonding, Lewis structures, and gas laws. Be prepared to apply these concepts to more in depth studies and in different sequences.
- D. Lay the foundation for future upper division classes that may ultimately lead to a career in areas such as medicine, education, engineering, chemical industry, forensics, pharmacy, energy, agriculture, textiles, and nutrition.

III. STUDENT LEARNING OUTCOMES FOR THIS COURSE

Terminal Objectives

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

- A. Perform dimensional analysis by working problems dealing with unit conversions stoichiometry, gas laws, and vapor pressure.
- B. Write, balance and classify chemical equations.

- C. Identify electrons through the use of quantum numbers, write electronic configurations of various chemical species, and identify the type of bonding that exists in selected chemicals.
- D. Draw Lewis structures and determine molecular shapes.

IV. TEXTBOOKS AND OTHER LEARNING RESOURCES

A. Required Textbooks

1. Silberberg, Martin S., Amateis, Patricia. Chemistry: The Molecular Nature of Matter and Change, 8th edition. McGraw-Hill Education, 2018. (reserve copies of the text will be available for checkout in the library)
2. Turning Technologies P/N: RCQR-01 clicker device (daily quizzes and parts of the exams will be given using the clicker device)
3. McGraw-Hill Connect Chemistry (to gain access to LearnSmart tutorials – purchasing the ebook includes the Connect access codes to enroll online)

B. Supplemental Materials

1. Scientific Calculator
2. Periodic Table (handout in class)

V. POLICIES AND PROCEDURES

A. University Policies and Procedures

1. Attendance at each class or laboratory is mandatory at Oral Roberts University. Excessive absences will 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, electronic, video, multimedia, or computer software. Plagiarism and other forms of cheating involve both lying and stealing and are violations of ORU's Honor Code: "I will not cheat or plagiarize; I will do my own academic work and will not inappropriately collaborate with other students on assignments." Plagiarism is usually defined as copying someone else's ideas, words, or sentence structure and submitting them as one's own. Other forms of academic dishonesty include (but are not limited to) the following:
 - a. Submitting another's work as one's own or colluding with someone else and submitting that work as though it were his or hers;
 - b. Failing to meet group assignment or project requirements while claiming to have done so;
 - c. Failing to cite sources used in a paper;
 - d. Creating results for experiments, observations, interviews, or projects that were not done;
 - e. Receiving or giving unauthorized help on assignments.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. Penalties for any of the above

infractions may result in disciplinary action including failing the assignment or failing the course or expulsion from the University, as determined by department and University guidelines.

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 the Whole Person Assessment requirements. Students should consult the Whole Person Assessment handbooks for requirements regarding general education and the students' majors.
 - a. The penalty for not submitting electronically or for incorrectly submitting an 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 Biology and Chemistry adheres to the Assessment policy concerning plagiarism as described in the University Catalog, "Written assignments using sources must demonstrate ethical and accurate use of source material. Plagiarism and any unethical or inappropriate use of sources are not 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. There is no Whole Person Assessment activity required in this course.

C. Course Policies and Procedures

1. Evaluation Procedures - Examinations
There are four exams given during the course of the semester plus a final exam given during finals week. Each exam is weighted equally in the overall course grade. The course calendar shows the planned dates for each exam.
2. Homework Quizzes
There will be a two or three homework questions assigned every class session. The following class session there will be a quiz over those homework questions. A student will always know what will comprise the quiz questions so diligence is needed to complete the daily work. The daily quizzes will also serve as the attendance record for the course.
3. Weekly LearnSmart Tutorials
There will be a LearnSmart tutorial assigned daily, each worth 10 points, and should take a student about 10-15 minutes to complete, depending on their overall understanding of the course material. The tutorials will be graded in weekly segments and recorded by weekly completion efforts. The Sunday night following each week's course content will serve as the cutoff date for getting all of that week's LearnSmart tutorials finished for course credit.

4. Course Grade
- | | <u>% of Course</u> |
|-----------------------------|--------------------|
| Hour exams | 60 |
| Final exam | 15 |
| Homework Quizzes | 15 |
| Weekly LearnSmart Tutorials | 10 |
5. Approximate curve for overall course
- | | |
|---|---------------|
| A | 88-100% |
| B | 78-87% |
| C | 68-77% |
| D | 58-67% |
| F | less than 58% |
6. Other Policies and/or Procedures
- 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 one to two hours studying for each hour of lecture. To achieve maximum results the student should do the following:
 - Read ahead. The pages of the textbook covered in each class session are listed on the first slide of each day's lesson. It is recommended to use the ebook that came with the Connect Learning system or borrow the hard copy textbooks on reserve in the library.
 - Do all of the assigned homework problems at the end of each chapter and look for others for which solutions are provided in the textbook for extra practice.
 - Ask questions over unclear material. Seek out the course Professor, the course study group, departmental tutors, lab instructors, online tutors and study buddies in the course who can assist your learning efforts. The lecturer, lab instructor, and tutors are eager to assist you with problems.
 - Student should not attempt to cram for exams!** Each chapter builds on the previous chapters, so students should not get behind.
7. Whole Person Assessment Requirements
(CHE or BMC majors only): None. The course assessment is attached to the lab course only.

VI. COURSE CALENDAR

WEEK	TOPIC	Silberberg
1	Matter and Units	Chapter 1
2	Atoms, Molecules and Nomenclature	Chapter 2
3	Mass Relationships and Stoichiometry	Chapter 3
4	Empirical and Molecular Formulas	Chapter 3 and 4
EXAM 1		

WEEK	TOPIC	Silberberg
5	Chemical Reactions and Solutions	Chapter 4
6	Structure of Atoms	Chapter 7
7	Quantum Mechanics	Chapter 8
8	Chemical Equations and Stoichiometry	Chapter 3
9	EXAM 2 ---SPRING BREAK---	
10	Solution Stoichiometry, Limiting Reactant and Chemical Bonding	Chapter 4 and 8
11	Chemical Periodicity	Chapter 8
12	Periodic Patterns	Chapter 14
13	EXAM 3 Chemical Bonding	Chapter 9
14	Molecular Structure and Bonding Theories	Chapters 10 and 11
15	Gas Laws and Intermolecular Forces	Chapters 5 and 12
16	EXAM 4 ---FINAL EXAM week---	

Course Inventory for ORU's Student Learning Outcomes

General Chemistry I Lecture – CHE 111 Spring 2018

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		