

GENERAL CHEMISTRY I (CH 111-01)

Fall 2018 Course Outline

Department of Natural Sciences and Environmental Health, Mississippi Valley State University
(3 Credit hours course)

Instructor: Bhanu Priya Viraka Nellore, Ph.D. (Dr. Bhanu)
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Class Meeting Time / Location: MW- 01:00 - 02:15 p.m. / FLW228

Office Hours: MW- 08:00-08:50a.m. 12:00-12:50 p.m. 2:00-02:50 p.m.; TR- 11:00-12:50 p.m.;
Other times by appointment only.

Prerequisites: None

Required Course Materials:

Text book: This course will require “An Atoms First Approach, 2nd Edition by Steven S. Zumdahl and Susan A. Zumdahl”, ISBN-10: 1-305-07924-8 / ISBN-13: 978-1-305-07924-3 from Cengage. Additional Reading will be assigned throughout the semester.

Online Quiz/Homework: Online assignment/quiz questions are available through Cengage Learning: Go to <https://www.cengage.com/> to register and pay for an account (see page 6 in the syllabus for how to register online). These exams (Quiz/ Assignment) will be computer-graded.

Course Description:

Introduce the fundamental concepts and basic principles of chemistry. Atomic structure, chemical bonding periodic table, stoichiometry, chemical formulas and equations, states of matter, nomenclature, valence, oxidation number, thermochemistry, solutions, reaction rates chemical equilibrium, oxygen, hydrogen, halogens, and elements of group I and II are discussed in this introductory course. Role of chemistry in understanding other natural science disciplines and human societal issues is emphasized.

Student Learning Outcomes/Course Objective:

The general outcome goals are that students will understand the basic principles of chemistry. And the following general course goals are established to meet the purposes of CH 111:

1. Develop fundamental understanding of the material classifications and properties.
2. Provide model exercises and demonstrations that enhance the understanding of natural principles and illustrate safe laboratory techniques and practices.
3. Raise awareness of the underlying logic of the presentations and the use of inductive and deductive reasoning.

4. Develop factual report writing skills.
5. Increase scientific vocabulary and facility with common pronunciation related to the use of that vocabulary.
6. Cultivate thoughtful, probing inquiry and discussion.
7. Clarify the significance of replicated, standards or controls, measurements, data reduction and presentation analysis, and accuracy in reporting of the scientific activities.

A general summary of detailed list of learning topics is summarized on pages 3 and 4, with the listing of chapters that will be covered. Most of the learning outcomes will be assessed by problems in which students must demonstrate their understanding. **It will be very difficult** to learn this science by “simply” memorizing different reactions without an understanding of the fundamental concepts that are the basis for these reactions.

Purpose:

Employing Mississippi Valley State University’s Holistic Transfer Model (HTM), CH 111 contributes to education and training of Holistic Transformers. It is our intention to not only teach fundamental chemistry relationships but also to develop the thinking processes of our students so that they will gain various insights into the workings of nature. These skills will transform the student into lifelong learners who can build upon accumulated knowledge and understandings. Additionally, these students can become facilitators who stimulate the natural curiosity of others. In doing so, CH 301 develops the skills and scientific background required of teachers of students in public schools by building upon prior knowledge and skills developed in preceding coursework presented by the Department of Sciences and Environmental Health, and by the College of Education.

Student Evaluation / Grading Scale:

Six online quizzes, six online assignments, a midterm, and a final exam will be given. Students are expected to submit their assigned work on or before the deadline. Whoever submits the assigned work after the deadline is not accepted. The quizzes and assignments will be announced in advance in the class.

Online Quizzes	6 X 25	= 150 points
Online Assignments	6 X 25	= 150 points
Mid Term	1 X 100	= 100 points
Final Exam	1 X 100	= 100 points
Professor personal assessment	1 X 25	= 25 points
Attendances (2 nd half of semester)	<u>1 X 25</u>	<u>= 25 points</u>
Total		= 550 points

The grading scale is as follows

A = 89 to 100%

B = 77 to 88.9%

C = 66 to 76.9%

D = 55 to 65.9%

F = Below 55%

Makeup policy: There will be **no makeup examinations** or makeup worksheet assignments for this class. Exceptions to this policy must be cleared in advance (only valid University related absences) and/or must be due to certifiable emergencies. Makeup exams will not be given to students before the class has taken the exam.

Attendance Policy:

Perfect attendance will be rewarded with 25 points of credit. One point will be deducted for every unexcused absence from 25 points. Be sure to sign the attendance sheet each day. Class room door will be locked at 01:10 p.m. Students at Mississippi Valley State University must fully commit themselves to their program of study. One hundred percent (100%) punctual class attendance is expected of all students in all scheduled classes and activities. When, for any reason, students are absent from class, it is their responsibility to present to the instructor as soon as possible (and not later than one day from the date of return) an official excuse for their absence. Any absence for which a student does not provide written official excuse is counted as an unexcused absence. Unexcused absences (e.g. 3 times for three-hour semester hour course) will be reported to the department chair and students must understand that “even with an official excuse of absence, students are responsible for the work required during their absence” during the class and exams.

Course Content and Tentative Time Line:

Week 1, and 2

Review, Measurement and Calculations in Chemistry: The SI system of units and prefixes, causes of uncertainty in measurement, significant figures, precision and accuracy in measurement, converting units between the English and metric systems, conversions among the Fahrenheit, Celsius, and Kelvin temperature scales, density.

Quiz I

Assignment I

Week 3 and 4

Chapter 1, Chemical Foundations: Creative problem solving, identify the principal operations and limitations of the scientific method, brief account of early chemical discoveries, the laws of conservation of mass, definite proportion, and multiple proportions, Dalton's theory of atoms and show the significance of Gay-Lussac's experiments, summarize the experiments that characterized the structure of the atom, features of subatomic particles.

Quiz II

Assignment II

Week 5 and 6

Chapter 2, Atomic Structure and Periodicity: Characterizing electromagnetic radiation in terms of wavelength, frequency, and speed, introduce the concept of quantized energy, wave and particulate properties light, diffraction experiments and the dual nature of matter, the line spectrum of hydrogen, development of the Bohr model for the hydrogen atom, Heisenberg uncertainty

principle, significance of electron probability distributions, the quantum numbers n , l , and m_l , shapes of orbitals designated by s , p , d , and f and orbital energies, electron spin and the electron spin quantum number, Pauli exclusion principle, quantum mechanical model as applied to atoms besides hydrogen, development of the periodic table, Aufbau principle, general trends in ionization energy, electron affinity, and atomic radius in the periodic table, types of information can be obtained from the periodic table.

Quiz III

Assignment III

Week 7

Midterm Week

(Review, Chapters 1, and 2)

Week 8 and 9

Chapters 3, Bonding: Ionic bond, covalent bond, polar covalent bond, nature of a bond in terms of electronegativity, predicting the formulas of ionic compounds, factors governing ion size, lattice energy and show how it can be calculated, relationship between electronegativity and the ionic character of a bond, the covalent bonding model, how bond energies can be used to calculate heats of reaction, localized electron model, writing Lewis structures, the concept of resonance and how to write resonance structures, naming compounds given their formulas and to write formulas given their names.

Quiz IV

Assignment IV

Week 10 and 11

Chapter 4, Molecular Structure and Orbitals: Predicting molecular geometry from the number of electron pairs, relationship between bond polarity and molecular polarity, formation of special atomic orbitals in covalent bonding, bond order, bonding in certain molecules of the general formula X_2 , Paramagnetism, bond order, bond energy, and bond length.

Quiz V

Assignment V

Week 12 and 13

Chapter 5, Stoichiometry: Modern atomic mass scale and how atomic masses are determined experimentally, atomic mass and its experimental determination, conceptual problem-solving approach to chemistry, importance of the mole concept, converting among moles, mass, and number of particles for a given sample, calculating values for molar mass. converting among molar mass, moles, and number of particles in a given sample, calculation of the mass percent of a given element in a compound, the calculation of the empirical formula of a compound, obtaining the molecular formula, given the empirical formula and the molar mass. identifying the characteristics of a chemical reaction and the information given by a chemical equation, writing a balanced equation to describe a chemical reaction, calculating the masses of reactants and products using the chemical equation, recognizing the limiting reactant, use of the limiting reactant.

Quiz VI

Assignment VI

Week 14

Fall Break/ Thanksgiving Break

Week 15

Review

Week 16

Final Exam

(Review, Chapters 1, 2, 3, 4, and 5)

Use of Technology:

Becoming a holistic transformer is facilitated by the use of technology. Scholarship and reflective thinking promoted by easy access to information that may include widely varying theories and knowledge bases related to an extensive array of scientific and educationally related subjects. The same is, of course, true for developing the habits of life-long learner and classroom facilitator. Therefore, the use of technology in various forms will be encouraged in preparing for classroom discussion, scientific inquiry, practical application exercises, and lesson-plan development. Such technology will include, though not be limited to

1. Computerized library searches for information using scientific and educational databases
2. Use of internet to perform in depth searches for information related to appropriate instructional methodology and materials for teaching students in science; and
3. Computer applications useful in instruction and in scientific applications (e.g., simulations, data and word processing).

Special Policies:

- **No cell phone** will be allowed. Please turn off the cell phone before entering the class room (No Exception). If your phone rings during the class or exam, you will be asked to leave the room, and you will be treated as an absent student. A student caught using a cell phone in class room or on an exam or quiz will receive zero points and considered absent for that exam/class and will be referred to the Department Chair/Dean of Students' office for appropriate action.
- **No breaks during the exam/quiz. No exceptions. A student can leave the class-room only after returning the exam/quiz.**
- Exam dates may be changed by the instructor. You must have to give the exam on the scheduled date.
- During the class, side talking/negative behavior is strictly prohibited. The instructor has right to ask you leave the class room for any unacceptable attitude and you will be treated as an absent student.
- **Class e-mail List:** An email list will be used to notify you of special scheduling information, test schedules or other miscellany. (Eg: If I am sick and won't be able to hold class; when and where practice tests are to be held; if there are errors in one of the practice tests or book problems or in something I communicated in class, etc.)
Note: A test e-mail will sent to all the students. If you haven't received one, contact me.

- **Intellectual Honesty:** Students are expected to follow principles of intellectual honesty. A student caught cheating on an exam or quiz will receive zero points for that exam or quiz and will be referred to the Dean of Students' office for appropriate action.

Students with Special Needs

Mississippi Valley State University is committed to providing reasonable accommodations for students with a documented disability. If you feel you are eligible to receive accommodations for a covered disability (medical, physical, psychiatric, learning, vision, hearing, etc.) and would like to request it for this course, you must be registered with the Services for Students with Disabilities (SSD) program administered by University College. It is recommended that you visit the Disabilities Office located inside the EMAP Computer Lab in the Technical Education (IT) Building to register for the program at the beginning of each semester. If you are determined to be eligible after your confidential consultation, you will be provided with a Memo of Accommodations that must be submitted to each of your instructors.

For more information or to schedule an appointment, please contact Mr. Billy Benson, Jr. via phone or email at 662-254-3005 or billy.benson@mvsu.edu.

How to access your OWLv2 course:

What is OWLv2?

OWLv2 is the most trusted online learning solution for chemistry, proven to help you get a better grade.

Registration

1. Connect to <https://login.cengagebrain.com/course/E-26E6LNRN4PN2Q>
2. Follow the prompts to register your OWLv2 course.

Payment

After registering for your course, you will need to pay for access using one of the options below

Online: You can pay online using a credit or debit card, or PayPal.

Bookstore: You may be able to purchase access to OWLv2 at your bookstore. Check with the bookstore to find out what they offer for your course.

Free Trial: If you are unable to pay at the start of the semester you may choose to access OWLv2 during your free trial. After the free trial ends you will be required to pay for access. Please note: At the end of the free trial period, your course access will be suspended until your payment has been made. All your scores and course activity will be saved and will be available to you after you pay for access.

If you already registered an access code or bought OWLv2 online, connect to <https://login.cengagebrain.com/course/E-26E6LNRN4PN2Q> to access your course.

Caveat:

The schedule and procedures in this course are subject to change at the discretion of the instructor.

Copyright Notice:

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Note: This document does not constitute a contract but a set of guidelines subject to change.