Description

This introductory chemistry course is the first part in the two-semester General Chemistry sequence. This course is designed to scientifically analyze matter at macroscopic as well as microscopic level. You will learn about atomic structure, chemical reactions, and quantitative aspects of reactions, gaseous state, solutions, thermo chemistry and molecular architecture. You are expected to have (or refresh quickly) good math skills and also recommended to refresh your high school chemistry knowledge. While the course may seem to proceed at a comfortable pace in the beginning, we will pick up the speed rather quickly. This is a first course in two-semester sequence, CHM 1045 and CHM 1046. This sequence includes two laboratories: CHM 1045L to be taken concurrently with CHM 1045 and CHM 1046L to be taken with CHM 1046. This sequence is for students who have already had High School Chemistry. Topics covered include chemical measurements, stoichiometry, atomic structure, periodic table, chemical bonding inorganic compounds, nomenclature, formula writing, gases, liquids, solids, solutions, acid-base chemistry and ionic reactions and some descriptive chemistry of non-metals. To enroll, students must have had some Chemistry at the High School or College level. Pre-requisite: MAC1105 with a C or better and a Co-requisite of CHM1045L.

Topics

Chapter 1-6, 8-12, 14
Introduction and Measurement
Atomic Structure and Periodicity
Inorganic Formula Writing and Nomenclature
Bonding
Stoichiometry
Acids, Bases, and Salts
Oxidation-Reduction
Solutions
Gases
Liquids and Solids
Some Descriptive Chemistry: Non-Metals

Outcomes

• To develop strong chemistry foundation for subsequent chemistry courses
• To test the chemical principles by performing experiments in safe, efficient and scientific manner
• To learn the “language of Chemistry”
• To develop strong conceptual and algorithmic skills dealing with chemical principles
• To develop strong problem solving skills
• To learn to be able to view matter microscopically
• To learn to be able to visualize molecular structure and correlate the structure to the reactivity

Required Material

Accessories: A scientific calculator (TI 30 or equivalent)

Course Evaluation

The classroom performance will be based on four examinations, homework and quizzes. First three exams will be conducted during the class time and the final exam is comprehensive and will be conducted during the last week of classes. Class exams will be based on the material covered up to and including the material discussed in the previous class. The test may have some multiple choice and some free response questions.

<table>
<thead>
<tr>
<th>Lecture grade weight</th>
<th>Final grade criteria</th>
<th>Important Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exam 1</td>
<td>22%</td>
<td>90% and above</td>
</tr>
<tr>
<td>Exam 2</td>
<td>22%</td>
<td>80% to 89.9%</td>
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<tr>
<td>Exam 3</td>
<td>22%</td>
<td>70% to 79.9%</td>
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<tr>
<td>Final Exam</td>
<td>34%</td>
<td>60% to 69.9%</td>
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<td></td>
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<td>Others</td>
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Guidelines and Classroom Etiquette

♦ Attendance is required and will be recorded in all lecture periods.
♦ You will be responsible for all the material covered in the class.
♦ During my office hours, I will neither re-teach the material nor explain the notes that you copied from someone else.
♦ Unprofessional behavior and academic dishonesty (defined below) will not be tolerated and dealt with administratively
♦ There will be no makeup exams.
♦ Calculator and must be used for computing purposes only
♦ Without a written, substantial and acceptable proof, you will not be allowed to makeup the missed work.
♦ Academic dishonesty (cheating, plagiarism, bribery, etc.) on exams, assignments, and lab reports will be dealt with harsh penalty, at minimum, with a failing grade in the course. As a general policy in this course, a penalty for cheating will always be greater than the penalty for doing the work poorly, or not doing it at all. Any sign of cheating during the examination will result with a zero on that test and will be immediately referred to the student Honor court. This may result in probation or suspension.

What is unprofessional behavior?
Consistent late arrival, leaving the class early, disruptiveness by beepers or cell phones, eating food, drinking beverages, leaving to the restroom, general disruptive behavior due to not studying prior to class. When a person consistently misses class (for whatever reason) and then expecting help outside the class is also unprofessional.

What constitutes cheating/plagiarism?
The use of notes, books and any other resources such as programmable calculators with stored information during the exam, copying from another student during a test, submitting work without proper citation of source. A student can become an unwilling participant in the cheating process by not being careful to cover the test so that a neighbor would not cheat. Whether you are a willing or an unwilling participant, the penalties are the same!

How do I succeed in this course?
Study ahead, review the material before the class. Work in groups, visit my website often, try all worksheets and problem sets, work out all sample exams ahead of time, ask questions in the class, answer questions in the class, review material soon after the class, get help at right time. Read and follow the “How to study for Chemistry”

Study & Homework
There is a general rule that for every hour of lecture, you need to spend two hours on quality study. I recommend that you make a habit of reviewing the material to be discussed in the following class as well. The homework will be collected all the homework on the day of each exam. I recommend that you do the homework on a continuing basis as soon as the related topic is discussed in the class. While I will not ask questions directly from the end-of chapter homework, working out these problems will give you adequate skills to perform well on my tests. You can bring the problems that you have trouble working out during my office hours.

Withdrawal & Audit
You are responsible to take care of all the paperwork needed for the withdrawal from the course in a timely manner as prescribed in the catalog. A late withdrawal can be assigned only under special circumstances and if I feel that it is appropriate; else an “F” will be assigned to you. If you are auditing this course, you are required to attend all the classes, do all the homework and take all the tests; else you will be assigned a “W” Please follow the requirements and restrictions regarding “auditing a course” in the catalog. As far as switching to a “audit” from “credit” I will not approve the request after the third exam has been administered.

Honesty
It is assumed that all work you do is totally your own. Any evidence of cheating on any assignment or exam will result in an automatic zero for that assignment / exam as well as the possibility of an “F” for the entire course, at my discretion. Additional policies and statements relating to student conduct and other procedures are found in the student handbook.

Tutors
Free tutors may be available through the Learning Resources Center (201-6663). Please contact the LRC for more information

Things you should know
If you do not have the mastery of the following, you are expected to learn these within the first week of classes.

Conversion, Metric ↔ British
fractions ↔ decimals ↔ Percent
1 mile = 5280 ft 1 yard = 3 ft 1 ft = 12 in 1 in = 2.54 cm
1 year = 365.25 days 1 pound = 454 g K = oC + 273.15
°C = 5/9 (°F-32) 1 mL = 1 cm³ = 1 cc 1 L = 1000 mL = 1 dm³
Diameter of a circle = 2r Circumference of a circle = 2π
Area→ square = length² rectangle = length x width circle = π² triangle = ½ base x height

Significant figures in a quantity with an uncertainty. Rounding-off rules for uncertain numbers
Basic SI Units: Length (m), Mass (kg), Time (s), Temperature (K), Amount (mol)
Derived units: area, volume, density, force, energy, velocity, pressure, and acceleration.
Metric multiple prefixes (femto – to – tera) (e.g. centi = 10⁻²)
Scientific notation, working with exponents and powers (refer to the math tutor link on my website)
Volume → cube = \( \text{length}^3 \)  
rectangular solid = \( lwh \)  
Sphere = \( \frac{4}{3} \pi \text{ radius}^3 \)  
cylinder = \( \pi \text{ radius}^2 \text{ height} \)
HOW TO STUDY CHEMISTRY?

Listening to Lectures
Read assigned material before coming to class. You will be sufficiently familiar with the material so you will more readily understand the lecture.

Taking Notes
- Try to capture the ideas and concepts of a lecture.
- Don't recopy your notes. You don't learn while copying material.
- Don't use a tape recorder. It takes too long to review the material.
- Take notes and review them immediately after class. In some research, a group that reviewed material immediately after a class recalled more than a group that didn't.
- Remembering what you have heard is usually more difficult than remembering what you have read. Therefore, take class notes so that you will have something to read.
- Don't do your remembering by memorizing. We need to be selective in what we memorize. William James said, "The essence of genius is to know what to overlook."
- Memorization should only be done with material that is understood. It should not be used as a means of escaping the effort to understand. Do not learn by memorizing what can be learned by reasoning. Use the five R's of note taking (the Cornell system):
  - Record: The meaningful ideas and concepts
  - Reduce: After class, summarize the main ideas and concepts
  - Recite: Say out loud in your own words the main ideas of the class.
  - Reflect: Take a few minutes to ponder over the main ideas of the class
  - Review: Once a week, review the ideas of all the semester's lectures.

Asking Questions
- During class, ask questions of yourself. It helps to keep you mentally alert. It helps you to look for answers in class.
- Always have at least two questions that you would like to ask each time you go to your class.

Making a Schedule
- Schedules are crucial to student success. They are a means of gaining extra time by making you more efficient and by helping you use small blocks of time that usually are wasted without a schedule.
- Schedules also help you prevent avoiding your study.

Studying
- Use daylight hours. Research shows that each hour used for study during the day is equal to one and a half hours at night.
- Study before each class. The material will be fresh in your mind.
- Study each subject in a one-hour block of time. It makes you more efficient. You don't become bored. Longer blocks of time lead to a waste of time.
- Allow time for sleep.
- Set realistic goals for yourself. You can reward yourself for being successful. If you waste all afternoon and then set a goal of studying chemistry from 6:00 p.m. to midnight, you may not be realistic. The chances are that you won't be successful; you will become frustrated.
- Study at a desk.
- Recite while studying. If you recite while writing, you will be learning while using your eyes and ears. If you can't say it, you don't know it.