

If it's green, it's biology; If it has numbers, it's math; If it doesn't work, it's technology; If it stinks, it's chemistry -- Unknown

General, Organic & Biological Chemistry

Spring 2010 Course Syllabus

10-806-199

4 credits

Instructor:

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T-151

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Office Hours:

11:00 – 11:50 pm M-F or by appointment

Course Description:

A one semester course covering the fundamental aspects of inorganic and organic chemistry. Topics include lab safety, measurement, elementary problem solving, atomic structure, periodicity, chemical bonding, types of chemical reactions, properties of water, acids, bases and salts, types of solutions and calculations of concentrations, gas laws, oxidation-reduction concepts, ionization, pH and buffers, hydrocarbons, types of organic compounds and functional groups, biochemical compounds including lipids, carbohydrates, proteins, and nucleic acids.

Course Goals:

After successful completion of this course, you will have acquired:

- A good understanding of the fundamental principles of chemistry and their application in everyday life.
- An introduction to the scientific method by observation, measurement and interpretation of data.
- An appreciation for the subject of chemistry and how it relates to other disciplines.
- And (hopefully) a healthy curiosity about science.

Course Competencies:

- A. Use dimensional analysis (factor-label method) to convert between measurement units.
- B. Describe the properties of matter and how these properties are measured.
- C. Explain the nature of matter.
- D. Use various symbols to represent the structure of the atom.
- E. Explain the formation of ionic and covalent bonds.
- F. Write formulas for and name inorganic compounds.
- G. Interpret chemical equations.
- H. Explain the behavior of matter during a chemical reaction.
- I. Explain the effects of temperature, pressure and number of moles on the volume of a gas.
- J. Integrate the gas law equations with the relationships implied in a chemical equation to solve stoichiometric problems involving gases.
- K. Relate the chemical and physical properties of water.
- L. Predict the behavior of solutions in equilibrium.

- M. Use various methods to measure and express the concentration of a solution and make dilutions.
- N. Predict the products of reactions involving common acids and bases.
- O. Predict the effect of a salt on the pH of a solution.
- P. Relate the organic functional groups to their names and chemical properties.
- Q. Explain how the various organic functional groups combine to form the major biochemical compounds.

Prerequisite:

Prep for Basic Chemistry (10-836-133) or high school biology or chemistry. One year of high school algebra is recommended.

Textbook:

General Chemistry – The Essential Concepts (5e), Raymond Chang, McGraw Hill (2008)

Laboratory manual:

Laboratory materials will be provided.

On-line Learning Center:

www.mhhe.com/chang (You will need to select our text and register using the access code found in your text. Note - not all of you will have the card with the access code.)

Required Supplies:

Scientific calculator. A graphing calculator is not necessary.

Course Assessment and Grading:

To pass this course you must have met the competencies. Your final grade will be based on the total points you have earned.

Quizzes:

There will be weekly quizzes on Tuesdays/Thursdays during the semester. Each is worth 10 points. The quizzes will typically be given at the beginning of the lab sessions. (15% of your grade)

Assignments:

Each chapter of the text will be accompanied by homework problems. You are responsible for knowing how to solve the assigned problems. Please keep a problem notebook. At the beginning of class on the due date, place your problem notebook on the corner of the front lab table. I will check to ensure that you have attempted to solve the assigned problems and return them to you so that we can go over the problems in class. (You may be called upon to solve them.) If after going over the problems you are still having difficulties, feel free to discuss with me. I will be happy to assist you. The solutions to the assigned problems will be available (after the assignment is due) in T-136 for your review. (5% of your grade)

Exams:

Three one-hour exams will be given. Each is worth 100 points. They will include a combination of multiple-choice / short answer questions and problems from both lecture and lab sessions. Exam dates will be announced in advance. Review sessions will be held. (300 total points - 60% of your grade)

Laboratory:

There will be approximately fourteen laboratory experiments, each of which is worth a maximum of 20 points unless otherwise stated. You will work in small groups to perform the experiment and gather the required data. You may work collectively on lab analysis but each student is required to submit an independent lab write-up. The write-ups are due the following lab period (one week later). You have a one week grace period. After this time, no credit will be given. (~160 total points - 20% of your grade)

Classroom Participation:

To be successful in this course you will need to actively participate in classroom activities. I will not give you a participation grade but if you are between letter grades at the end of semester, I will use your degree of participation to decide between the two grades.

Your grade will be based on the following:

You have met all of the course competencies and earned:

92.0 - 100 → A	72.0 - 77.9 → C
90.0 - 91.9 → A-	70.0 - 71.9 → C-
88.0 - 89.9 → B+	68.0 - 69.9 → D+
82.0 - 87.9 → B	62.0 - 67.9 → D
80.0 - 81.9 → B-	60.0 - 61.9 → D-
78.0 - 79.9 → C+	

If you have not met the course competencies and earned below 60.0 → F

Attendance:

Attendance is expected at every class but there is no formal attendance policy. If you plan to do well in this course, you should make every effort to attend, as you are responsible for all the material presented in lectures and the laboratory. **If you are unable to attend a quiz, test or laboratory session, you must notify me in advance via the phone or e-mail. No make-up is possible without prior notification.** Please note that it will be very difficult to make up lab sessions due to room usage.

District Academic Honesty Standards:

The Mid-State Technical College Board, administration, faculty and staff believe that academic honesty and integrity are fundamental to the mission of higher education. All students are expected to maintain and promote the highest standards of personal honesty and professional integrity. These standards apply to all examinations, assigned work and projects. Therefore, a student who is found to have been dishonest, fraudulent or deceptive in the completion of work or willing to help others to do so or is found to have plagiarized (presented the work of others as his or her own) is subject to disciplinary action up to and including suspension.

ADA Statement:

If you know you have a recognized disability, or suspect that you might have one, it is your responsibility to identify yourself as soon as possible to the Disabilities Services staff in Student Affairs. Course standards will not be lowered but various kinds of accommodations are available to you. Adequate and reasonable time will be required to develop and provide appropriate accommodations, so contact Disability Services as soon as possible. It is MSTC's goal to assist you in your individual educational plan.

Course Email Policy:

All email correspondence to your instructors must be sent through your official campus email account. For safety against computer viruses and to remove SPAM email messages, your instructor may delete without reading any email from an account other than your assigned mstc.edu address. If you use any other email account (such as yahoo or hotmail) to contact your instructor – you must assume that the message will not be read. Students are encouraged to read their campus email regularly.

Lecture Schedule:

Topic	Text Chapter
Syllabus Discussion, Safety	
Introduction	1
Atoms, Molecules and Ions	2
Stoichiometry	3
Reactions in Aqueous Solutions	4 (13,16)
Gases	5
The Periodic Table	8
Chemical Bonding	9
Intermolecular Forces and Liquids and Solids	12
Introduction to Organic Chemistry	11 (22)

Lab Schedule:

To be announced.

Here are some tips for success in Chemistry:

1. Read the text before attending lecture.
2. Take lecture notes and recopy them as soon after lecture as possible, adding material from the textbook, and writing explanations in your own words.
3. Do the assigned problems...and do more if possible.
4. Strive for understanding instead of just familiarity. It may take several attempts to gain understanding of the material. Be patient with yourself!

“A person who never made a mistake never tried anything new.” Albert Einstein (1879-1955)