

General Chemistry for Engineers

SECTION: CHEM 251-XXX CRN: XXXXX
 COREQUISITE LAB: 251-XXX
 LECTURE TIME: XXXX
 ROOM: XXX

“Chemistry...is one of the broadest branches of science, if for no other reason that when we think about it, everything is chemistry.”
 - Luciano Caglioti, *The Two Faces of Chemistry*

COURSE DESCRIPTION

One semester general chemistry course designed to provide a background for future engineers while learning critical thinking and problem solving skills.

INSTRUCTOR

Rebecca M. Jones, Ph.D.
 Associate Professor
 Department of Chemistry and Biochemistry
 STEM Accelerator, College of Science

Phone: (703) 993-1804
 Email: rjones22@gmu.edu
 Office: Exploratory Hall 1402
 Office Hours: TBA

LEARNING ASSISTANT

TBA

REQUIRED MATERIALS

TopHat General Chemistry

Used for: E-book, attendance, lecture notes, and interactive questions

Course name: Chem 251 Fall 2016

Login to TopHat.com or use the mobile apps. Enter this join code to participate: 466367



Sapling Learning

Used for: Online Homework Assessment

Section: George Mason University – CHEM 251 - Fall15- JONES

Follow instructions described later in the syllabus

First assignments DUE: Tuesday September 6, 2016



STUDENT RESPONSIBILITY

Lecture topics are scheduled for the entire semester; you will benefit by reading the appropriate sections of the text before coming to lecture. Online homework assignments will be assigned and graded during the semester. You are encouraged to work together and keep up with the pace of the class by working on problems after each lecture. Worksheets may also be distributed throughout the semester to supplement the text.

Chemistry is learned by practice; you must be willing to spend the time required to learn the concepts that will be covered in this course. For each hour in class, you can expect to spend 3-4 hours out of class reading, completing homework, reviewing notes and preparing for exams. Students are responsible for any and all course changes during the semester; significant changes will be announced in class and on Blackboard.

PARTICIPATION

Successful completion of this course requires attendance and participation at all lecture and lab periods. If you are absent from a normal class period, you are responsible for all the material covered. If you are involved in a university activity and will miss a class in which an exam will be given, you must contact the professor at least one week in advance to schedule a make-up time. An absence will be excused only if the instructor is notified in advance (e.g. before 8:00am on the day of the absence) and suitable documentation is provided to explain (e.g. a doctor's note). No make-up exams or quizzes for unexcused absences will be given.

CALCULATORS

A scientific calculator capable of scientific notation, base-10 and natural logarithms is required and should be brought to every class. A 2-line display, such as in the TI-30X IIS from Texas Instruments, is recommended. No graphing calculators or those with extended memory are allowed. No sharing of calculators is allowed during exams.

EVALUATION

Student performance evaluation will consist of online homework assignments, midterm exams, participation and a cumulative final exam. Sapling Homework assignments are due throughout the semester, usually weekly. Students are responsible for keeping track of homework due dates and times. Participation grades will be assigned based upon TopHat and Piazza. A minimum grade scale is shown below. A midterm grade shall be awarded for all students in this course. The midterm grade may not necessarily be based on 50% of the course requirements and may or may not differ from the final grade.

Method	Number	Value	Total
Homework	<i>Log in to Sapling Learning</i>		125*
Participation	1	50	50
Exams	3	125	375
Final Exam	1	200	200
Lab	<i>See lab syllabus</i>		250
Total Points Possible			1000

*Your homework percentage will be converted to points. (For example, if you successfully complete 94.3% of assigned homework, you will earn 117.9 points toward your final grade, which is 94.3% of the total possible.)

Total Points Earned	Letter Grade (+/- ranges to be determined)
900-1000	A- / A / A+
775-899	B- / B / B+
625-774	C / C+
500-624	D / D+
1-499	F

EXAMS

Exam dates are shown in the attached class schedule. Only approved calculators will be allowed; no cell phones or other mobile devices may be used. Exams and quizzes may require that you show your work; assume that all questions say 'explain' or 'show calculations'. Often, the numerical answer will not be worth the full point value of the question. Partial credit will be awarded in appropriate situations. When requested, you should bring a Scantron form for exams.

HOMEWORK

We will be using Sapling Learning for the mandatory homework portion of this course. To set-up your account, following these instructions.

1. Go to <http://saplinglearning.com> and click on "US Higher Ed" at the top right.
2. Log into Sapling Learning
 - a. If you already have a Sapling Learning account, log in and skip to step 3.
 - b. If you have Facebook account, you can use it to quickly create a Sapling Learning account. Click the blue button with the Facebook symbol on it (just to the left of the username field). The form will auto-fill with information from your Facebook account. Choose a password and timezone, accept the site policy agreement, and click "Create my new account". You can then skip to step 3.
 - c. Otherwise, click the "Create an Account" link. Supply the requested information and click "Create My Account". Check your email (and spam filter) for a message from Sapling Learning and click on the link provided in that email.
3. Find your course in the list (you may need to expand the subject and term categories) and click the link.
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4. Select a payment option and following the remaining instructions.

Once you have registered and enrolled, you can log in at any time to complete or review your homework assignments.

During sign up or throughout the term, if you have any technical problems or grading issues, send an email to support@saplinglearning.com explaining the issue. The Sapling Learning support team is almost always faster and better able to resolve issues than your instructor.

LEARNING OUTCOMES AND GOALS

The overall goal of General Chemistry is to teach students to think about the properties and behavior of the macroscopic world in terms of the structure and arrangement of the constituent molecules and atoms.

Learning Outcomes for General Chemistry

- to understand the molecular nature of all phases of matter,
- to understand the various ways of depicting chemical compounds and chemical reactions,
- to develop an ability to solve basic quantitative problems regarding the properties of molecules, chemical equilibria, and chemical kinetics, and

- to develop the ability to appropriately apply this knowledge to general scientific problems in various fields of science and engineering.

Upon successful completion of CHEM 251, you will understand:

1. The basic structures of atoms, ions, and molecules, and ways to quantitatively describe the properties of atoms and molecules in the various phases of pure matter and in mixtures.
2. The reactivity of atoms, ions, and molecules, and the various qualitative and quantitative methods for describing and depicting chemical reactions.
3. The relationship between the electronic configurations of atoms and molecules and their chemical properties.
4. The concept of chemical equilibrium, and the energies that drive chemical reactions: an introduction to the field of thermodynamics.
5. The concept of chemical kinetics and the energy required to initiate a chemical reaction.

General Education at Mason

General Education at George Mason University is designed to complement work in a student's chosen area of study. These classes serve as a means of discovery for students, providing a foundation for learning, connecting to potential new areas of interest and building tools for success in whatever field a student pursues. Learning outcomes are guided by the qualities every student should develop as they move toward graduating with a George Mason degree. This course fulfills part of the natural science component of General Education at Mason.

Natural Science

The general education natural sciences courses engage student in scientific exploration; foster their curiosity; enhance their enthusiasm for science; and enable them to apply scientific knowledge and reasoning to personal, professional and public decision-making. Lab courses must meet all five learning outcomes; non lab courses must meet learning outcomes 1 through 4.

To achieve these goals, students will:

1. Understand how scientific inquiry is based on investigation of evidence from the natural world, and that scientific knowledge and understanding:
 - evolves based on new evidence
 - differs from personal and cultural belief
2. Recognize the scope and limits of science
3. Recognize and articulate the relationship between the natural sciences and society and the application of science to societal challenges (e.g., health, conversation, sustainability, energy, natural disasters, etc.)
4. Evaluate scientific information (e.g., distinguish primary and secondary sources, assess credibility and validity of information)
5. Participate in scientific inquiry and communicate the elements of the process, including:
 - Making careful and systematic observations
 - Developing and testing a hypothesis
 - Analyzing evidence
 - Interpreting results

ACADEMIC INTEGRITY

Students are expected to conduct themselves appropriately at all times. Disruptive students who refuse to cooperate will be asked to leave the class session and may be removed from the course. Disruptive behavior may be defined, but is not limited to, any activities that disturb the learning environment including disrespectful outbursts, offensive language, and the use of any electronic or other device that interrupts the concentration of others. Cell phones, pagers, etc. must be turned off or silenced for the duration of class.

Mason has an Honor Code with clear guidelines regarding academic integrity. Three fundamental and rather simple principles to follow at all times are that: (1) all work submitted be your own; (2) when using the work or ideas of others, including fellow students, give full credit through accurate citations; and (3) if you are uncertain about the ground rules on a particular assignment, ask for clarification. No grade is important enough to justify academic misconduct.

Academic and classroom misconduct will not be tolerated. Academic dishonesty may be defined as any act of dishonesty in academic work. This includes, but is not limited to, plagiarism, the changing or falsifying of any academic documents or materials, cheating, and giving or receiving of unauthorized aid in tests, examinations, or other assigned work. Students guilty of academic misconduct, either directly or indirectly through participation or assistance, are immediately responsible to the instructor of the class. The penalty for cheating will be a grade of "F" on the work in question; at the instructor's discretion, the incident may be referred to academic affairs for disciplinary action.

DIVERSITY

George Mason University promotes a living and learning environment for outstanding growth and productivity among its students, faculty and staff. Through its curriculum, programs, policies, procedures, services and resources, Mason strives to maintain a quality environment for work, study and personal growth.

PRIVACY

Students must use their University email account to receive important University information, including messages related to this project. See <http://masonlive.gmu.edu> for more information.

DISABILITY ACCOMMODATIONS

If you are a student with a disability and you need academic accommodations, please see me and contact the Office of Disability Services (ODS) at 993-2474, <http://ods.gmu.edu>. All academic accommodations must be arranged through the ODS. In order to receive accommodations, students must submit the appropriate forms at least one week before an exam.

A PERSONAL NOTE

Chemistry is a challenging subject, but it can be very interesting and rewarding! I want you to succeed in this class and will do all I can to help you do well. Regular attendance and completing assigned problems will positively influence your grade. Asking questions is very encouraged. I look forward to a positive semester!

This syllabus is tentative and subject to change at the professor's discretion.