

General Chemistry II

2nd Summer Session 2014 Syllabus

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Program website: <https://canvas.evergreen.edu/courses/243>

Science Instructional Technician: Diane Nelsen

Program Meetings: 9am-2pm, Monday-Friday. The first class session will be on Wednesday, July 30th. There will be not be class on Friday, August 22nd or Friday, August 29th. A lunch break will take place each day and will be placed to best suit the day's learning agenda.

Program Locations:

- Laboratory days: Lab II, 1241 (August 1, 7, 13 and 19)
- Data Analysis workshops: CAL East (August 5 and 14, 9am-noon)
- All other class meetings:
 - M-Tu: SEM II, D-3107
 - W, F: SEM II, D-2109
 - Th: SEM II, E-3107

About the program:

This program is designed to offer the equivalent of the second half of a year-long course in general chemistry with lab. The topics to be presented will include thermochemistry, properties and physical changes of matter, kinetics, chemical equilibrium, acid-base chemistry, aqueous equilibria, and thermodynamics. We will explore the themes of climate and environmental change as socially-relevant issues that connect chemistry and society. Program activities will include lectures, problem-solving workshops, seminars and laboratories. Laboratory work will build upon the skills learned in General Chemistry I, and provide hands-on experience with experimental design and application of chemical concepts.

Program goals:

At the end of this program, you will be able to analyze theoretical information or experimental data about a chemical reaction to determine the direction, extent, and rate at which the reaction will proceed as well as the associated energetic changes. As a result of participating in General Chemistry II, you will also improve your ability to:

1. Ask and answer scientific questions by posing hypotheses, designing experiments, and synthesizing results.
2. Solve quantitative problems applying chemical principles.
3. Communicate scientific concepts through in-class discussions, oral presentations and writing exercises.
4. Connect chemical principles with issues relevant to your everyday life and to society.

Assignment descriptions:

Homework

There will be homework problems assigned from each chapter of the textbook. These assignments provide you the opportunity to practice your skills, apply the information you are learning, and demonstrate your knowledge. All quizzes will be taken directly from the homework assignments. Homework assignments will be collected at the end of the five-week

quarter, submitted portfolio style to be considered in writing the final evaluation. It is expected that each student keeps up with and completes all homework assignments.

Quizzes and exams

There will be eight short quizzes, two 1-hour exams and a 2-hour final exam. All quiz questions will be taken directly from your homework assignments. Non-metric conversion factors, constants, a periodic table, and some formulas will be provided.

Laboratory experiments and lab packets

Hands-on laboratory experience is an essential part of learning chemistry. Lab experiments will be posted to the program website and it is your responsibility to print out, read, complete the pre-lab assignment, and bring the lab packet to our scheduled lab times. Lab packets will contain a pre-lab assignment; questions throughout the write-up with room for your answers, diagrams, etc.; and post-lab questions. Pre-lab assignments should be completed before the start of lab time. Complete lab packets will be submitted at the start of class on the due dates listed on the program schedule.

For the labs in weeks 1 and 3, you and your lab partner will design your own experimental procedure to investigate a given problem. For these labs, in addition to submitting the lab packet, you will also prepare a short presentation sharing your experimental procedure and results with the class. Each of these labs will also have an associated writing assignment in which you will communicate information related to the lab experiment in a format written for a non-scientific audience.

Seminars

There will be four seminars in which we will read and discuss journal or news articles that connect to chemical concepts covered in the program. The purpose of these seminars is to make connections between chemistry and socially-relevant issues and discuss the role of scientists and scientific research in society. Seminar readings will be posted on the program website. To ensure that discussions are thoughtful, productive, and constructive, we will have prep sheets due for each seminar. These are meant to guide your reading, and should not be more than half a typewritten page in length. In the prep sheet, you will:

1. Identify the main arguments stated by the author, as well as a few key supporting arguments.
2. For each argument or topic, write all the questions you had about this section. For example, this can include clarification questions, concerns you had about an opinion expressed by the author, or questions for further research.
3. Spend about five minutes writing about a broad question related to the reading. This should be related to the topic, but shouldn't simply repeat what the author said. What did this reading get you thinking about? What did you think about the argument presented? Do you see connections to other topics we've covered in this program, or in other programs?
4. Metacognition. If you didn't understand something, ask yourself: What aspect of it didn't you understand? What questions would you ask an expert to help clarify your understanding?

Current article report and presentation

For your final assignment in the program, you will explore a connection between chemistry and society that is of interest to you. Find a current article related to chemistry in a magazine or newspaper or reliable website. This can be on any subject as long as you can identify a connection to chemistry and the subject is of interest to you.

You will write a 1-2 page report on the article in which you will:

1. Explain your interest in the subject (i.e. what made you select this article?).
2. Summarize the article (present the major ideas in a concise form), taking care not to plagiarize.
3. Discuss a piece of chemistry-related information in the article and explain how it is connected with an idea that you have already learned in chemistry.
4. Identify another piece of chemistry-related information or concept in the article, which you would like to know more about. Explain why you are interested in learning more about it.
5. Find out more to satisfy your curiosity, and summarize what you learned; also cite the source of your information.
6. Analyze how the author of this article chose to convey scientific content to the article's intended audience.

In addition to the written report, you will give a short (5-minute) presentation on your article in class August 27.

Evaluations

You must write an evaluation of the faculty member and a self-evaluation at the end of the quarter. It is optional for you to submit your self-evaluation to the Registrar for your transcript.

Student expectations:

1. If you must miss class (for reasons such as illness or a family emergency), you must let me know in advance.
2. Due to the fast pace of this program, I will not accept late work. If you believe you have extenuating circumstances that require extra time, you must let me know in advance.
3. Be on-time.
4. Turn your cell phone off or on vibrate during class.
5. Be engaged during class.
6. Don't cheat or plagiarize any material.
7. Maintain a safe, respectful, and collaborative environment at all times.

Disabilities:

If you have a disability that will affect your learning, or if you need assistance in any way, please let me know. Also, be sure to contact Access Services (Library 2153), which provides a variety of different types of support for students with disabilities, including testing accommodations.

Tutors:

The Quantitative and Symbolic Reasoning Center (QuaSR) has a part-time tutor available specifically for General Chemistry II, as well as a full-time chemistry tutor. The QuaSR center is

located in the library, room 2304 (www.evergreen.edu/mathcenter). Also, The Writing Center (www.evergreen.edu/writingcenter) is a great resource for students needing help with writing skills, and the center offers one-on-one tutoring.

Required books and supplies:

- *Chemistry: An Atoms First Approach* by Steven Zumdahl and Susan Zumdahl (2012) ISBN # 0-8400-6532-9
- Additional required readings will be posted in a secure location on our program web page
- Scientific Calculator (This does not need to be graphing and can be a quite inexpensive model)
- Laboratory safety goggles

Program schedule:

This schedule is a fluid document and may change as the program progresses. Changes will be announced in class and posted to the program website. It is recommended that you regularly check the program website. Readings should be completed prior to the day listed. Homework problems should be completed prior to the next class session.

Day and Date	Location	Reading and Homework Assignments	Program Topics and Activities
Wednesday July 30	SEM II, D-2109	Chapter 6 (6.1) HW: 6 (10, 25, 26, 29, 31)	Introductions and program overview Lecture/workshop: Energy and Earth's climate, heat and work
Thursday July 31	SEM II, E-3107	Chapter 6 (6.2-6.7) HW: 6 (37, 39, 42, 44, 47, 52, 55, 74, 86, 87) DUE: Seminar prep sheet	Lecture/workshop: Energy and enthalpy Seminar: Climate change communication
Friday August 1	Lab II, 1241	DUE: Pre-lab assignment for the Deicer Lab	Chemistry Laboratory Day: Deicer Lab
Monday August 4	SEM II, D-3107	Chapter 8 (8.1-8.2, 8.8-8.9) HW: 8 (39, 89, 94, 97, 99, 109, 133, 134)	Quiz #1: Energy and enthalpy Lecture/workshop: Intermolecular forces, changes of state, phase diagrams
Tuesday August 5	9am: CAL East 12pm: SEM II, D-3107	Chapter 12 (12.1-12.4) HW: 12 (26, 27, 29, 34, 40, 43, 44, 48, 53) DUE: Deicer lab packet	Data analysis workshop: Experimental determination of rate laws Deicer Lab group presentations

Wednesday August 6	SEM II, D-2109	Chapter 12 (12.5-12.7) HW: 12 (12, 18, 20, 57, 60, 68, 81, 85, 102) DUE: Seminar prep sheet	Quiz #2: States of matter and rate laws Lecture/workshop: Reaction kinetics Seminar: Stratospheric ozone depletion
Thursday August 7	Lab II, 1241	DUE: Pre-lab assignment for the Enzyme Kinetics Lab DUE: Pre-lab assignment for the Vapor Pressure Lab DUE: Deicer Lab writing assignment	Chemistry Laboratory Day: (1) Enzyme Kinetics Lab, (2) Vapor Pressure Lab
Friday August 8	SEM II, D-2109	Chapter 13 (13.1-13.6) HW: 13 (11, 12, 14, 28, 30, 33, 38, 39, 43, 54, 88, 99, 106)	Exam #1: Chapters 6, 8, 12 Lecture/workshop: Equilibrium, equilibrium expressions
Monday August 11	SEM II, D-3107	Chapter 13 (13.7) HW: 13 (20, 63, 66, 70)	Quiz #3: Equilibrium expressions Lecture/workshop: More on equilibrium, Le Chatelier's Principle
Tuesday August 12	SEM II, D-3107	Chapter 14 HW: 14 (20, 22, 30, 38, 40, 50, 51, 56, 68, 73, 95, 104, 106, 120, 171, 172) DUE: Enzyme Kinetics lab packet DUE: Vapor Pressure lab packet	Quiz #4: Le Chatelier's Principle Lecture/workshop: Acids and bases
Wednesday August 13	Lab II, 1241	DUE: Pre-lab assignment for Ocean Acidification Lab	Chemistry Laboratory Day: Ocean Acidification Lab
Thursday August 14	9am: CAL East 12pm: SEM II, E-3107	DUE: Seminar prep sheet	Data analysis workshop: Oysters and ocean acidification Seminar: Ocean Acidification
Friday	SEM II,	Chapter 15 (15.1-15.3)	Quiz #5: Acids and bases

August 15	D-2109	HW: 15 (21, 23, 25, 27, 29, 36, 42, 48, 106)	Lecture/workshop: Acid-base equilibria, buffered solutions
Monday August 18	SEM II, D-3107	Chapter 15 (15.4-15.5) HW: 15 (12, 15, 54, 57, 64, 80, 107) DUE: Ocean Acidification lab packet	Quiz #6: Buffers Ocean Acidification Lab group presentations Lecture/workshop: More on acid-base equilibria, titrations
Tuesday August 19	SEM II, D-3107	DUE: Pre-lab assignment for Water Quality Lab	Chemistry Laboratory Day (Lab II, 1241): Water Quality Lab
Wednesday August 20	SEM II, D-2109	Chapter 16 HW: 16 (20, 23, 35, 40, 44, 48, 51, 56, 69, 95) DUE: Seminar prep sheet	Exam #2: Chapters 13, 14, 15 Lecture/workshop: Solubility, complex ion equilibria Seminar: Hypoxia in Puget Sound
Thursday August 21	SEM II, E-3107	DUE: Ocean Acidification Lab writing assignment	Lecture/workshop: More on solubility and complex ion equilibria
Monday August 25	SEM II, D-3107	Chapter 17 (17.1-17.6) HW: 17 (34, 37, 44, 51, 54, 56, 60) DUE: Water Quality lab packet	Quiz #7: Solubility and complex ion equilibria Lecture/workshop: Spontaneity, entropy, and free energy
Tuesday August 26	SEM II, D-3107	Chapter 17 (17.7-17.9) HW: 17 (22, 65, 72, 73, 79, 103, 108, 113, 115)	Quiz #8: Spontaneity, entropy and free energy Lecture/workshop: More on spontaneity, entropy and free energy
Wednesday August 27	SEM II, D-2109	DUE: Current article report	Current article class presentations Review Workshop
Thursday August 28	SEM II, E-3107	DUE: All homework assignments, organized in a portfolio	Final Exam: Chapters 6, 8, 12, 13, 14, 15, 16, 17