

General Chemistry II
CHEMISTRY 210 SYLLABUS
Minnesota State University Moorhead
Professor Dr. Craig P. Jasperse

Classroom: Langseth 104 Dr. Craig P. Jasperse web: http://web.mnstate.edu/jasperse/Chem210/Chem210.html Office: Hagen 407J Telephone: 477-2230 e-mail: jasperse@mnstate.edu	Office Hours: Mon 12:30-2:30 Tues 10:30-11:30, 3:30-4:30, Wed 12:30-2:30 Thurs 2:00-4:00 Fri 12:30-2:30
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Test Schedule

Test #1: Ch. 10 Forces between Ions and Molecules
Wednesday, Feb 7 Ch. 11 Solutions and Their Colligative Properties
 Ch. 12 The Chemistry of Solids
 Ch. 15 Chemical Kinetics: Rates of Reactions

Test #2: Ch. 16 Chemical Equilibrium
Wednesday, Mar 6 Ch. 17a Equilibrium in the Aqueous Phases: Acids and Bases

Test #3: Ch. 17b Equilibrium in the Aqueous Phases: Buffers, Solubility, Titrations
Monday, April 8 Ch. 14 Thermodynamics: Spontaneous Processes, Entropy, and Free Energy

Test #4: Ch. 19 Electrochemistry and Its Applications
Friday, April 26 Ch. 21 Nuclear Chemistry

Final Exam Comprehensive
Monday, May 6 9am

Grading Summary:

Tests 400 points (4 x 100)
 Final exam 150 points (1 x 150)
 Quizzes + Smartwork 100 points

Tentative letter grades

A $\geq 90\%$
 B $\geq 78\%$
 C $\geq 66\%$
 D $\geq 54\%$

- The instructor may lower but will not raise the numbers required for a letter grade.

Attendance: **Perfect attendance will be rewarded with 10 points of extra credit** and a single absence with 5 points of extra credit. Be sure to sign the attendance sheet each day!

Final Exam: The final exam will be cumulative.

Jasperse website: <http://web.mnstate.edu/jasperse/Chem210/Chem210.html> This will provide links to:

Notes for use in class	Recorded Lectures	Extra Practice Sets	Quizzes
Practice Tests	Jasperse Schedule	Textbook Info	Miscellaneous

Book Homework Problems: All assigned book problems are representative of what I consider to be reasonable test-level problems, and have worked-out answers in the Solutions Manual. With solutions manuals available, I will not collect the book homework. After each class, review your notes and try to work all of the assigned book problems for the sections covered. Do all of the assigned end-of-chapter problems as soon as a chapter is completed in class.

On-line “SmartWork” homework Problems: You will be required to buy access to an on-line homework system. These problems will be computer-graded, will give you some practice and sometimes tips, and will help to keep you from procrastinating. They will also function as an effort-based way to improve your class average and grade. (Average scores on SmartWork will be way higher than on tests.)

Recorded Lectures and On-Line Availability: I will either try to record all of the regular class periods and post the movie-versions, or provide recordings from last year. I will also record and post **practice test sessions**, and perhaps extra problems or comments or pre-test tips.

Recorded on-line lectures will be used on Snow Days/Flood Days

Class E-Mail List

An email list will be used to notify you of special scheduling information or other miscellany. (If I am sick and won't be able to hold class; if there are errors in one of the practice tests or book problems or in something I communicated in class, etc.) The list defaults to your official mnstate e-mail address. If that isn't what you actually use, contact me.

- Note: Test e-mails have already been sent. If you haven't received any, something needs correction!

HOMEWORK: DOING HOMEWORK PROBLEMS REGULARLY AND FAITHFULLY IS THE BEST WAY TO ENSURE A HAPPY AND SUCCESSFUL OUTCOME IN THIS CLASS!

Suggested Study Strategy: Diving right into homework problems isn't very useful if you don't know how to solve them! Learn the concepts first!

1. Read/think through your class notes twice before attacking the OWL assignments.
2. If you don't get something, it may help to review the class lecture video.
3. Do any “Concept Tests” and “Practice Exercises” in the appropriate sections of the book.
4. Do any “extra practice” sets that I provide.
5. Do your SmartWork problems.
6. Do review problems at the back of each chapter. I'm listing lots, ones that I consider fair game and testable type problems. Try to at least do most of the problems with bold numbers. (Answers are in back of book. Additional explanations about solutions are in the Solutions Manual, which you would do well to buy.)
7. Read the text. It really helps; you will learn a ton; things on which I was unclear or too fast in class you can process at your own speed. You may wish to move this up to a much higher number!
8. Do all the practice tests well in advance of the actual test.

Course Description

CHEM 210: General chemistry principles: kinetics, chemical equilibrium, acid-base chemistry, solubility equilibrium, thermodynamics, oxidation-reduction, electrochemistry, coordination chemistry, and nuclear chemistry. Should register for CHEM 210L to be taken concurrently. CHEM 210 and 210L are both required to satisfy LASC 3 requirements. MnTC Goal 3.

Outline of Major Content Areas

1.States of matter and their relationship to/interaction with energy. 2.Chemical kinetics.
3.Chemical equilibrium. 4.Acid-base chemistry. 5.Thermodynamics. 6.Reduction-Oxidation chemistry.

Student Learning Outcomes/Course Objectives

The general outcome goals are that students will understand the fundamental principles associated with kinetics, chemical equilibrium, acid-base chemistry, solubility equilibrium, thermodynamics, oxidation-reduction, and electrochemistry. A general summary of major learning topics is summarized on page 1, with the listing of chapters that will be covered. A more detailed list of learning topics is summarized on page 4, with an approximately day-by-day listing of topic coverage. Most of the learning outcomes will be assessed by having students demonstrate and apply understanding in the context of case study problems. The list of problems on page 3 represents a detailed and representative sampling of the types of problems that should be solvable by a student who has achieved all the learning outcomes.

Academic Honesty

Cheating will not be tolerated and will be reported to the Dean of your College and the Vice President for Academic Affairs. It may also be reported to the Student Conduct Committee for further disciplinary action. For a full description of the MSUM Academic Honesty Policy, please see the Student Handbook. (<http://www.mnstate.edu/s handbook/POLICY/index.htm>)

Special Accommodations Students with disabilities who believe they may need an accommodation in this class are encouraged to contact Greg Toutges, Coordinator of Disability Services at 477-5859 (Voice) or 1-800-627-3529 (MRS/TTY), CMU 114 as soon as possible to ensure that accommodations are implemented in a timely fashion.

GENERAL CHEMISTRY II (CHEM 210) PROBLEMS

SPRING 2024 Dr. Craig P. Jasperse

Dr. Craig P. Jasperse

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Phone: 477-2230

Recommended Book Problems, Chem 210:

Ch.	Concept Test	Practice Exercises	Review Question At the Back of The Chapter
	Test 1		10.1, 3, 4, 7, 9, 10, 13-20, 23-27, 33-35, 40, 48, 49a,b, 50, 59, 60, 65, 71-76, 79, 85, 86, 89-94, 99, 105
10	p465,469,470,474, 476, 484, 488(2)	10.1, 2, 3, 7,	10.1, 3, 4, 7, 9, 10, 13-20, 23-27, 33-35, 40, 48, 49a,b, 50, 59, 60, 65, 71-76, 79, 85, 86, 89-94, 99, 105
11	p513, 515, 524		11.1, 3, 8-11, 13, 21, 22, 27, 37, 38, 39, 61-64,
12	None		
15	p704, 709, 714, 720, 727a,c, 728,	15.1, 2, 4, 6	15.1-6, 25-36, 42, 43, 45, 47a,b, 48, 49, 50a,b, 53-55 57-62, 72, 75, 82, 89, 90, 92, 95-98, 100, 101, 111, 112, 117, 124-126, 128,
	Test 2		
16	p767, 788	16.1(K _c), 2,6,7,8, 10, 11,12	16.3, 7, 9, 10, 11, 13, 15, 19(K _c), 20(K _c), 21, 22, 25, 26, 39, 41, 43-46, 49-54, 59-63, 65, 67, 71-74, 83, 93, 94, 96-98
17a	P820, 825, 825, 826, 829, 832, 838, 843, 844	17.1, 2, 3, 4, 5, 7, 8	17.9-24, 27-34, 36-40, 43-47, 49, 50, 57, 59-66, 72-74, 77, 79, 80
	Test 3		
17b	P851(bottom), 856, 862, 862	17.9, 10, 11, 12	17.3, 7, 81-95, 97, 98, 101-111, 114-116, 119-121, 123-125, 127, 129, 131-133,
14	P660, 672, 680, 682, 683,	14.1, 2, 3, 4a,b, 5, 6, 7	14.3, 5-7, 8, 10, 11, 15, 16a-c, 17b-d, 19, 20, 23-27, 31-37, 39, 40, 43, 45, 46, 48, 50, 55-59
	Test 4		
19	P921, 922, 924, 929, 931, 932, 944,	19.1, 2, 3, 4, 5, 6, 7, 8	19.2, 3, 10, 13-17, 21, 25-28, 33-37, 41-44, 47-50, 55-56, 60, 61-64, 71-73
21	p996, 999, 1005, 1007, 1009, 1015, 1025	21.1, 2, 3, 4, 7	21.1-7, 9, 11, 17-19, 21-24, 27-29, 31-37, 51-54, 59, 63-64, 87, 89-92

Chemistry 210, Jasperse, Spring 2024 (43 class days, 4 Tests, 39 lectures)			Reading Assignment
Date	Topic		
1	8-Jan	Intro. Liquids, Solids, and Noncovalent/Intermolecular Forces between Molecules.	10.1-3
2	10-Jan	Noncovalent/Intermolecular Forces between Molecules.	10.2,3, 9.3
3	12-Jan	Phase Changes, Phase Diagrams, Wonderful Water, Catchup	10.5, 5.3, 5.4, 10.6
	15-Jan	No Class. Martin Luther King Day.	
4	17-Jan	Liquid State, Vapor Pressure, Boiling	10.4, 11.2
5	19-Jan	Solubility and What Impacts Solubility Omit: 11.5	11.1
6	22-Jan	Factors Affecting Solubility; Impact of Dissolved Solutes on Solution Properties	11.3,11.4
7	24-Jan	Solids; Catchup	12.1,4,6
8	26-Jan	Reaction Rates; Dependence on Concentrations Omit: 12.2,3,5,7,8	15.1-3
9	29-Jan	Reaction Rates, Rate Laws	15.2-3
10	31-Jan	Elementary Reactions; Temperature Effects; Rate Laws; Reaction Mechanisms	15.4-6
11	2-Feb	Catalysts; Catchup	catchup
12	5-Feb	Equilibrium, Equilibrium Constants	16.1-3
T1	7-Feb	Test 1, Chapters 11, 15, and 13	
13	9-Feb	Equilibrium Constants: Determining Them, the Meaning Of Them, and Using Them	16.3-6
14	12-Feb	Shifting Equilibria: When an Equilibrium is Disturbed. LeChatelier's Principle	16.7-10
15	14-Feb	Acids/Bases; Dissociation of Water	17.1
16	16-Feb	pH Scale; Ka and Kb Constants	17.1-3
17	19-Feb	Ka and Kb Constants; Problem Solving Using Ka and Kb	17.3
18	21-Feb	Ka and Kb Constants; Problem Solving Using Ka and Kb	17.3-6
19	23-Feb	Molecular Structure and Acid Strength	17.5-6
20	26-Feb	Acid-Base Behavior of Salts; Lewis Acids and Bases	17.3-6
21	28-Feb	Catchup	catchup
22	1-Mar	Buffer Solutions	17.7-8
23	4-Mar	Acid-Base Titrations; Acid Rain	17.10
T2	6-Mar	Test 2, Chapters 16 and 17A	
24	8-Mar	Solubility	17.9
	11-Mar	Spring Break	
	13-Mar	Spring Break	
	15-Mar	Spring Break	
25	18-Mar	Factors That Affect Solubility	catchup
26	20-Mar	Reaction Direction; Probability; Entropy	17.9, 17.7
27	22-Mar	Entropy, Entropy Changes, and 2nd Law of Thermodynamics	14.1-4
28	25-Mar	Free Energy and the Equilibrium Constant, Miscellaneous	14.5,6
29	27-Mar	catchup	catchup
	29-Mar	No Class, Good Friday	
	1-Apr	No Class, Easter Monday	
30	3-Apr	Oxidation Numbers, Oxidation-Reduction Reactions	19.1-3
31	5-Apr	Balancing Redox Reactions, Electrochemical Cells	19.3
T3	8-Apr	Test 3, Chapters 17B and 14	
32	10-Apr	Cell Voltage, Using Standard Cell Potentials	19.3-5
33	12-Apr	Voltage/Free Energy/Concentration Relationship, Neuron Cells, Common Batteries	19.5-7
34	15-Apr	Electrolysis, Counting Electrons, Corrosion	19.8-9
35	20-Apr	Radioactivity, Nuclear Reactions, Patterns of Nuclear Stability	21.1-3
36	22-Apr	Nuclear Transmutations, Rates of Radioactive Decay	21.4-6
37	22-Apr	Fission, Fusion, Radiation, Applications	21.7-10
38	24-Apr	catchup	catchup
T4	26-Apr	Test 4, Chapters 19 and 20	
39	29-Apr	Class Evaluations, Final Exam Practice	
	May 6	Final Exam, 9am. , Monday	

SmartWork OnLine Homework

Instructions for registering:

<https://knowledgebase.wwnorton.com/help/smartwork-students-getting-started>

-gives instructions for both new registrations and for returning students.

ENROLLMENT KEY: CHEM210 (case-sensitive).