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Syllabus - Chemistry 3C - Summer 2024

When Do The Classes Meet?

- The course runs from July 29 - August 30.
- **Class times are 9:00 - 11:30 AM on Mondays, Wednesdays, and Fridays in Physical Sciences Building Room 114.**
- There are also discussion sections for this course, see schedule below.
- All lectures will be recorded and are accessible on [Yuja](https://canvas.ucsc.edu/courses/74620/external_tools/6825) (https://canvas.ucsc.edu/courses/74620/external_tools/6825).

Lecture Topics and Reading Schedule

Dates	Mon	Wed	Fri
Jul 29 - Aug 2	Chapter 6.1, 6.2 First law of thermo, enthalpy, pressure-volume work	Chapter 6.3, 6.4 Calorimetry, Hess's Law, enthalpy of formation	Chapter 20.1 2nd law of thermo
Aug 5 - Aug 9	Chapter 20.2, 20.3 Entropy, free energy and spontaneity	Chapter 20.4 Free energy, equilibrium, and non-standard conditions	Exam 1 Chapter 21.1 Redox reactions
Aug 12 - Aug 16	Chapter 21.2, 21.3 Galvanic cells, and cell potential	Chapter 21.4, 21.7 The Nernst equation, K _{sp} , and electrolysis	Chapter 12.1, 12.2 Intermolecular forces, states of matter and phase changes
Aug 19 - Aug 23	Chapter 12.3, 12.4 Vapor pressure, Clausius-Clapeyron equation, phase	Chapter 12.6 Structures of solids and the unit cell	Exam 2 Chapter 13.1, 13.2

	diagrams, properties of water		The nature of solutions and solubility, enthalpy of solution
Aug 26 - Aug 30	Chapter 13.2, 13.3 Temperature effects on solubility, concentration calculations	Chapter 13.4, 13.5 Colligative properties, Raoult's Law	Final Exam

Class Format

- Chem 3C classes will include in person lectures followed by opportunities to practice with worksheets in a classroom setting with instructor and TAs. There are also supplemental lecture videos for all topics created by the instructor (from 2020). Watching these before coming to class will be very useful. Exams and quizzes will be taken in class. This summer course is accelerated (a 10-week course in only 5-weeks), so the material will be presented quickly. However, there will be ample time in class to practice and get help from the teaching team.

Working with ALEKS

- ALEKS** will be used for all homework assignments called "Objectives". The student should enter ALEKS using the menu link on the left. If needed, our class code is **XPVUE-CQNFR**.

- Pricing for ALEKS 6-week access**

ALEKS only: \$25

ALEKS 360 (includes e-textbook): \$35

How to Find the Class Content

- You will find a wealth of information and study aides in the Modules on Canvas

What is Covered

- This course covers intermolecular forces, thermodynamics (the 1st, 2nd, and 3rd laws), electrochemistry, the nature of pure substances, and the properties of solutions.
- In our textbook, Silberberg and Amateis, 10th ed., we cover chapters 6, 12, 13, 20, and 21. The textbook is available with your ALEKS subscription.

What Students Will Do

- Read the assigned pages in the textbook. These are specified on schedule above.
- Watch the supplemental video lectures (found in Modules) if possible before coming to class.
- Complete the Objectives in ALEKS.

- Review the lecture slides found in modules.
- Work extra problems found in modules.
- Attend TA-led discussion sections.
- Log into Canvas regularly, our web portal for the course.
- Post questions for the teaching team and other classmates to Canvas Discussions.
- Take two 90 min midterm exams and one 2.5 hour final exam.

General Learning Outcomes

- Recognize how energy flow controls the outcome of a chemical reaction.
- Develop a quantitative understanding of why a reaction goes forward or backward or not at all.
- Utilize electrochemical potentials to predict reaction outcomes.
- Analyze the forces attracting molecules to one another.
- Know the microscopic structures of pure solids, liquids, and gases.
- Predict outcomes of the solution processes by knowing the physical properties of solutions.

Required Materials

- ALEKS Subscription, which includes access to the textbook.
- Scientific Calculator.

Graded Elements of the Course

- **ALEKS Pie Completion (40% of your grade):** Completing all objectives.
- **Attendance in Class and in Section (10% of your grade):** The Attendance grade will be scaled with the number of attendances each student has. Lecture and section attendances will count equally.
- **Midterm Exams (25% of your grade):** There are 2 midterms.
- **Final Exam (25% of your grade):** The final exam is on the last day of the course.

Late Policy

- TBA

Discussion Section Times and Locations

Class	Class Title	Enrolled	Days & Times	Room	TA Name	Class Dates
CHEM 1C-01A (52355)	General Chemistry (Discussion)	25	Mondays 1-2 pm	Merrill Acad 130	Sophia Tallcott	July 29 - August 30
CHEM 1C-01B (52356)	General Chemistry (Discussion)	26	Fridays 1-2 pm	Merrill Acad 130	Sophia Tallcott	July 29 - August 30

Time Budget for this Course

A 3-credit course assumes a median workload of 12 hours per week, depending on your prior knowledge of chemistry. For this course, estimates of the weekly workload are:

- 7.5 hours: Attend lecture
- 10-12 hours: Completing ALEKS Assignments (required)
- 1 hour: Attending Discussion Section (mandatory)
- 1-3 hours: reviewing material

Letter grade equivalent of percentage score:

- A+: 96.50-100
- A: 92.50-96.49
- A-: 89.50-92.49
- B+: 85.50-89.49
- B: 81.50-85.49
- B-: 76.50-81.49
- C+: 71.50-76.49
- C: 59.50-71.49
- D: 54.50-59.49

The Teaching Team

Instructor

- Dr. Peter Weiss – Continuing Lecturer
 - pweiss@ucsc.edu (<mailto:pweiss@ucsc.edu>)
 - (831) 459-1616
 - Research website: <https://fognet.ucsc.edu> (<https://fognet.ucsc.edu>)
 - Office hours: Tuesdays and Thursdays 11:00-noon

Office location: Physical Science Building 454 or at <https://ucsc.zoom.us/j/9775776872?pwd=dmR4M1VOMG10QUxON3dYNm1mdzFkUT09> (<https://ucsc.zoom.us/j/9775776872?pwd=dmR4M1VOMG10QUxON3dYNm1mdzFkUT09>) (email me ahead of time if you want to meet on zoom).

TAs

Sophia Tallcott	Office hours: W and Th at	stallcot@ucsc.edu
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12:30-1:30 pm in PSB 209

Small Group Tutoring









The Small Group Tutor for this class:













Joshua Robles (he/him) joalrobl@ucsc.edu (<mailto:joalrobl@ucsc.edu>)









Important Dates:

- Students can sign-up for tutoring on Monday, July 29th
- Sessions begin Wednesday, July 31st

Course Summary:

Date	Details	Due
Mon Jul 29, 2024	 Objective 1: Review (https://canvas.ucsc.edu/courses/74620/assignments/600026)	due by 11:59pm
Wed Jul 31, 2024	 Test 1 material: Videos on phase changes	to do: 11:59am
	 Welcome to Chem 3C: First get started with ALEKS	to do: 11:59am
	 Objective 2: Work and Enthalpy (https://canvas.ucsc.edu/courses/74620/assignments/600027)	due by 11:59pm
Fri Aug 2, 2024	 Objective 3: Heat capacity (https://canvas.ucsc.edu/courses/74620/assignments/600028)	due by 11:59pm
	 Objective 4: Heat of reaction (https://canvas.ucsc.edu/courses/74620/assignments/600029)	due by 11:59pm
Wed Aug 7, 2024	 Short Video on Entropy	to do: 8am
Thu Aug 8, 2024	 Objective 5: Melting, Boiling, Heating/Cooling Curves (https://canvas.ucsc.edu/courses/74620/assignments/600030)	due by 11:59pm

Date	Details	Due
	 Objective 6: Entropy Predictions https://canvas.ucsc.edu/courses/74620/assignments/600031	due by 11:59pm
	 Objective 7: Entropy Calculations https://canvas.ucsc.edu/courses/74620/assignments/600032	due by 11:59pm
	 Objective 8: Gibbs Free Energy; Equilibrium Review https://canvas.ucsc.edu/courses/74620/assignments/600033	due by 11:59pm
	 Objective 9: Phase Transitions; Energy under non-standard conditions https://canvas.ucsc.edu/courses/74620/assignments/600034	due by 11:59pm
Fri Aug 9, 2024	 Midterm 1 - Free Response https://canvas.ucsc.edu/courses/74620/assignments/611105	due by 10:35am
	 Midterm 1 - Multiple Choice https://canvas.ucsc.edu/courses/74620/assignments/610496	due by 10:35am
	 Objective 10: Redox Reactions https://canvas.ucsc.edu/courses/74620/assignments/600035	due by 11:59pm
	 Objective 11: Galvanic Cell https://canvas.ucsc.edu/courses/74620/assignments/600036	due by 11:59pm
Thu Aug 15, 2024	 Objective 12: Using standard reduction potentials https://canvas.ucsc.edu/courses/74620/assignments/600037	due by 11:59pm
	 Objective 13: E-chem under non-standard conditions https://canvas.ucsc.edu/courses/74620/assignments/600038	due by 11:59pm
	 Objective 14: Electrolysis https://canvas.ucsc.edu/courses/74620/assignments/600039	due by 11:59pm
Thu Aug 22, 2024	 Objective 15: Intermolecular Forces	due by 11:59pm

Date	Details	Due
	(https://canvas.ucsc.edu/courses/74620/assignments/600042)	
	 Objective 16: The Unit Cell (https://canvas.ucsc.edu/courses/74620/assignments/600043)	due by 11:59pm
	 Objective 17: Clausius-Clapeyron Equation (https://canvas.ucsc.edu/courses/74620/assignments/600044)	due by 11:59pm
	 Objective 18: Solution Composition (https://canvas.ucsc.edu/courses/74620/assignments/600045)	due by 11:59pm
	 Objective 19: Gas solubility (https://canvas.ucsc.edu/courses/74620/assignments/600040)	due by 11:59pm
Thu Aug 29, 2024	 Objective 20: BP elevation and FP depression (https://canvas.ucsc.edu/courses/74620/assignments/600041)	due by 11:59pm
	 Objective 21: Raoult's Law and Electrolyte Solutions (https://canvas.ucsc.edu/courses/74620/assignments/600046)	due by 11:59pm
	 Roll Call Attendance (https://canvas.ucsc.edu/courses/74620/assignments/602326)	
	 Syllabus Acknowledgement (New Quiz) (https://canvas.ucsc.edu/courses/74620/assignments/567235)	