

Course Map

Course Name:

Explorations in Chemistry

Course Number:

CHMY 105

Instructor Name:

Hans Helmstetler

Date:

Fall 2015

Course Objectives/Competencies:

1. Explain chemistry on an atomic or molecular level in fundamental theoretical areas and visualize what happens in a chemical change.



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2. Communicate the importance of precision, accuracy, and uncertainty in measurements.
3. Apply methods of inquiry used by chemists.
4. Construct a scientific laboratory report including analytical analysis of the work.
5. Apply the method of dimensional analysis in problem solving
6. Explain and demonstrate the importance of chemical safety, cleanliness, and respect in the laboratory and daily life.
7. Navigate and utilize appropriate software in solving chemical problems.

Course Materials (Text, edition and any other publisher items)

Textbooks and/or Resources:

- Access to a computer
- Zumdahl and DeCoste(2015) *Introductory chemistry: A Foundation (8th e.)*. Belmont, Ca. Brooks/Cole/Cengage Learning
- Scientific Calculator
- Access to ALEKS homework system
- Access to a 16-25 foot tape measure and ruler
- Access to a Webcam
- Access to digital camera or scanner
- Access to a printer

Course Description:



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An investigation of chemistry, including software and other tools, laboratory methods, and problem solving skills. Topics include the scientific method and its role in the continued development of chemistry; physical and chemical changes; chemical reactions; atoms, elements, and the periodic table; units of measure; dimensional analysis; uncertainty and propagation of error; states of matter; chemical bonding; writing and balancing chemical equations; naming chemical substances; and solving stoichiometry and limiting reactant problems. *Prerequisite: appropriate placement test score in math or a grade of "C" or better in M065 ; or chemistry department consent.*



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Module	Objectives	Content, Activities, or Challenges (Learner Interaction & Engagement)	Assessments	Publish to OER
Week 1 & 2	1 – 7	<ul style="list-style-type: none"> • Syllabus quiz must complete with 100% for Week 1-2 content module to open • Safety Unit: Must complete all quizzes with 100% for Week 1-2 content module to open • Read - Chapter 1, Chapter 3.1-3.4, Chapter 4.1-4.6 • ALEKS Math Assessment • Bubble gum activity • ALEKS Objective #1 • Discussion • Elements, Compounds and Mixtures, poem, https://youtu.be/-GpNK0IKsDw 1. Welcome, https://youtu.be/6axVd-q8-xE 2. Syllabus, https://youtu.be/fUUNtY7hJSU 3. Scientific Method, https://youtu.be/i2TxydIR8KA 4. Bubble Gum Activity, https://youtu.be/bbnazzijs10 5. Introduction to Classifying Matter, 	<ul style="list-style-type: none"> • Syllabus Quiz • Safety Quiz • ALEKS • Discussion 	<ul style="list-style-type: none"> • Syllabus • Bubble gum activity • Discussion • Videos 1, 4 – 7, 10, 13, 15, 18 - 19



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Module	Objectives	Content, Activities, or Challenges (Learner Interaction & Engagement)	Assessments	Publish to OER
		<p>https://youtu.be/BzRm0xKiTho</p> <p>6. Classifying Matter Part 2, https://youtu.be/lZ0GljMG9Zg</p> <p>7. Physical and Chemical Properties and Changes, https://youtu.be/SJ_CclzOrlg</p> <p>8. Elements and Compounds, https://youtu.be/HaERUfp7gGA</p> <p>9. Compounds Part 1, https://youtu.be/fxcqR24v3-4</p> <p>10. Compounds Part 2, https://youtu.be/0bzIEVRwBfQ.</p> <p>11. Introduction to Mixtures, https://youtu.be/Ac-dc_Vyxjc .</p> <p>12. Types of Mixtures, https://youtu.be/Bh6s93M3l8Q</p> <p>13. Separating Mixtures, https://youtu.be/-GpNK0IKsDw</p> <p>14. The Elements, https://youtu.be/GThu4GFUbB0</p> <p>15. Dalton's Atomic Theory, https://youtu.be/QgnEt-twdRQ</p> <p>16. The Atom After Dalton, https://youtu.be/2lumZeXMTP8</p> <p>17. Modern Atom, https://youtu.be/duXuo_L5v4Q</p> <p>18. Chemical Formulas Part 1, https://youtu.be/Uk1tXc39jdU</p> <p>19. Chemical Formulas Part 2, https://youtu.be/LGKEK8zPPc4</p>		



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Module	Objectives	Content, Activities, or Challenges (Learner Interaction & Engagement)	Assessments	Publish to OER
Week 3	1 - 7	<ul style="list-style-type: none"> • Read Chapter 4.7-4.11 • Atomic Theory Lab • ALEKS Objective #2 Homework <ol style="list-style-type: none"> 1. Atomic Symbols Part 1, https://youtu.be/vzvtv-KjkJys 2. Atomic Symbols Part 2, https://youtu.be/wjpb-XNr3oo 3. Atomic Symbols Part 3, https://youtu.be/41uNuIHHkx0 4. Atomic Symbols Part 4, https://youtu.be/-N6StoR7BC0 5. Atomic Symbols Part 5, https://youtu.be/P--Fo4kmQrk 6. Atomic Symbols Part 6, https://youtu.be/U5Ucf6sV1v0 7. Atomic Symbols Part 7, https://youtu.be/WvQyLn5Fd9c 8. Periodic Table Part 1, https://youtu.be/l4qRZdo3ynA 9. Periodic Table Part 2, https://youtu.be/nzBhPqrEekA 10. Periodic Table Part 3, https://youtu.be/Z_ktwQNPpdY 11. Periodic Table Part 4, https://youtu.be/2sj32Z9Mu_E 	<ul style="list-style-type: none"> • ALEKS • Atomic Theory Lab 	<ul style="list-style-type: none"> • Atomic Theory Lab • Videos 1 – 11, 13, 15



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		12. Periodic Table Part 5 , https://youtu.be/CdeGg2brkMo * 13. Simple Ionic Formulas Part 1 , https://youtu.be/rzrnCxWQmAQ 14. Simple Ionic Formula Part 2 , https://youtu.be/_QubzEFgfiw * 15. Simple Ionic Formulas Part 3 , https://youtu.be/_UsCwPPcaGQ		
Week 4	1 – 7	<ul style="list-style-type: none"> Review Live Check-in by Zoom or office visit ALEKS Objective #3 EXAM 1 	<ul style="list-style-type: none"> ALEKS Exam 1 	
Week 5	1 – 7	<ul style="list-style-type: none"> Read Chapter 5.1-5.5 Nomenclature lab ALEKS Homework 1. Nomenclature Part 1 , https://youtu.be/zNvhVLzfPgM 2. Nomenclature Part 2 , https://youtu.be/dVg-Hz8VVUY 3. Nomenclature Part 3 , https://youtu.be/w-bb1Flrehl 4. Nomenclature 4 , https://youtu.be/WuVQhP4n1Ok	<ul style="list-style-type: none"> ALEKS Nomenclature Lab 	<ul style="list-style-type: none"> Videos 1 - 11



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		5. Nomenclature 5 , https://youtu.be/D2_76mltxrY 6. Nomenclature 6 , https://youtu.be/VGT0-inQiwI 7. Nomenclature 7 , https://youtu.be/lfSf1VqweLM 8. Nomenclature 8 Acids and Bases , https://youtu.be/2CSrktI54vQ 9. Nomenclature 9 , https://youtu.be/NhdZZpqJwU4 10. Nomenclature 10 Examples , https://youtu.be/z_fqIMzp9ws 11. Nomenclature 11 , https://youtu.be/LxeAykBLRcc		
Week 6	1 – 7	<ul style="list-style-type: none"> • Read Chapter 6.1-6.3 • Check-in by email, private discussion board, Zoom or in office • ALEKS Objective #4 • Balancing Equations Worksheet • ALEKS Objective #5 • Introduction to Chemical Equations, https://youtu.be/WmjbiG_G2K8 	<ul style="list-style-type: none"> • ALEKS • Balancing Equations Worksheet 	<ul style="list-style-type: none"> • Balancing Equations Worksheet • Introduction to Chemical Equations



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Week 7	1 - 7	<ul style="list-style-type: none"> • Read Chapter 7.1-7.2, 7.4-7.7 • EXAM 2 • ALEKS Objective #6 • Labs at FVCC Campus <ul style="list-style-type: none"> ○ Measurement Lab ○ Classifying Chemical Reactions ○ Writing Chemical Reactions ○ Ionic and Covalent Compounds ○ Freezing and Melting of Water ○ The Mole 1. Introduction to Chemical Reactions, https://youtu.be/56f_6QZoJF4 2. Classifying Chemical Reactions, https://youtu.be/XiyGa1IlaBk 3. Classifying Reactions Examples Part 1, https://youtu.be/E7uXKPTo6yw 4. Classifying Reactions Examples Part 2, 	<ul style="list-style-type: none"> • Exam 2 • ALEKS 	<ul style="list-style-type: none"> • Videos 1 – 13 • Measurement lab • The Mole • Videos 1 - 13



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Module	Objectives	Content, Activities, or Challenges (Learner Interaction & Engagement)	Assessments	Publish to OER
		<p>https://youtu.be/DnPuM5Avcx4</p> <p>5. Classifying Reactions Examples Part 3, https://youtu.be/fhQuGlx9Lg4</p> <p>6. Classifying Reactions Examples Part 4, https://youtu.be/7Wn9NHDQbdo</p> <p>7. Redox Reactions, https://youtu.be/WNNfOzqZo7c</p> <p>8. Redox Reactions Part 2, https://youtu.be/KmRANMyQbuU</p> <p>9. Redox Reactions Example, https://youtu.be/7eCTIWom8Qs</p> <p>10. Determining Double Displacement Products, https://youtu.be/PgDWeDphkbQ</p> <p>11. Introduction to Solubility, https://youtu.be/5Z42RSunl3c</p> <p>12. Solubility Example, https://youtu.be/f9x9vqoMRB4</p> <p>13. Acids and Bases, https://youtu.be/xe2YY0j9pVM</p>		
Week 8	1 – 7	<ul style="list-style-type: none"> • Read 7.1-7.2, 7.4-7.7 and 2.1-2.3 • Freezing and Melting of Water Lab Report • Ionic and Covalent Compounds Lab Report 	<ul style="list-style-type: none"> • ALEKS • Lab Reports 	



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		<ul style="list-style-type: none"> • ALEKS Objective #6 • Lecture Videos 		
Week 9	1 – 7	<ul style="list-style-type: none"> • Read Chapter 2.4-2.5 • Scientific Notation and Significant Figures Notebook Report • Covalent Compounds Lab Report • Chapter 2.1 -2.5 Worksheet #1 • ALEKS Objective #7 Homework <ol style="list-style-type: none"> 1. Sig Fig Part 1, https://youtu.be/xR4mEqandyo 2. Sig Fig Part 2, https://youtu.be/cpkN-ewLyLk 3. Rounding, https://youtu.be/yfCAVSkztxs 4. Precision and Accuracy, https://youtu.be/PehEJFX93-c 5. Sig Fig Calculations, https://youtu.be/O3UMUOd25N8 		<ul style="list-style-type: none"> • Scientific Notation and Significant Figures Lab • Video 1 - 5
Week 10	1 – 7	<ul style="list-style-type: none"> • Review 2.1-2.5 • Units, Conversions, and the Metric System Notebook Report • ALEKS Objective #8 	<ul style="list-style-type: none"> • Lab Report • Exam 3 • ALEKS 	<ul style="list-style-type: none"> • Units, Conversions, and the Metric System Lab



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		<ul style="list-style-type: none"> • Chapter 2.1 -2.5 Worksheet #2 • EXAM 3 • Discussion 		
Week 11	1 – 7	<ul style="list-style-type: none"> • Read Chapter 2.6-2.8 • ALEKS • Density of Glass Lab Report • Worksheet 2.6-2.8 #1 • Discussion <ol style="list-style-type: none"> 1. Dimensional Analysis Part 1, https://youtu.be/SWSOFwnd9-Q 2. Dimensional Analysis Part 2, https://youtu.be/a1cnCXohmns 3. Dimensional Analysis Part 3, https://youtu.be/y2gGLOr0_Do 4. Dimensional Analysis Part 4, https://youtu.be/N-yPXPOpT4E 5. Dimensional Analysis Part 5, https://youtu.be/wvIR3DWisoU 	<ul style="list-style-type: none"> • Lab Report • ALEKS • Worksheet 	<ul style="list-style-type: none"> • Density of Glass Lab • Worksheet 2.6-2.8 #1 • Videos 1 – 5
Week 12	1 – 7	<ul style="list-style-type: none"> • Read Chapter 2.6-2.8 • Worksheet 2.6-2.8 #2 • ALEKS Objective #9 	<ul style="list-style-type: none"> • Worksheet • ALEKS 	<ul style="list-style-type: none"> • Worksheet 2.6 – 2.8 #2 • Videos 1, 3, 5



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		<ul style="list-style-type: none"> EXAM 4 Thursday Discussion <ol style="list-style-type: none"> Temperature, https://youtu.be/tR5PhN1uqeA Density Introduction, https://youtu.be/et-OvM3s5rl Density Problems, https://youtu.be/iMIOpRMA7J8 Density of Glass Lab Introduction, https://youtu.be/DAO7iw7Ronw Logger Pro, https://youtu.be/LRWxZriCzxs 		
Week 13	1 - 7	<ul style="list-style-type: none"> Read Chapter 8.1-8.5 The Mole Notebook Report Check-in live Worksheet 8.1-8.5 ALEKS Objective #10 <ol style="list-style-type: none"> Introduction to the mole, https://youtu.be/9pvd_sfW_r0 The Mole Part 2, https://youtu.be/H39p8_0qVBI The Mole Part 3, https://youtu.be/tq-D4TFexyo 	<ul style="list-style-type: none"> The Mole Lab Worksheet ALEKS 	<ul style="list-style-type: none"> The Mole Lab Worksheet 8.1 – 8.5 Videos 1 - 3



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Week 14	1 – 7	<ul style="list-style-type: none"> • Read Chapter 9.1-9.3 • Smores Notebook • Worksheet 9.1 – 9.3 • 5 Tips for a Better Thanksgiving through Chemistry - Bytesize Science, https://youtu.be/zfTQY_9b9ec • Video – Stoichiometry • Video – Stoichiometry Problem 	<ul style="list-style-type: none"> • Lab Report • Worksheet 	<ul style="list-style-type: none"> • Smore’s Lab • Worksheet 9.1 – 9.3
Week 15	1 – 7	<ul style="list-style-type: none"> • Read Chapter 9.4-9.5 • Hozits Notebook Report • ALEKS Objective #11 Discussion • Videos Limiting Reactants Part 1 and Part 2 	<ul style="list-style-type: none"> • Lab Report • ALEKS 	
Week 16	1 – 7	<ul style="list-style-type: none"> • Review of Content • Discussion • EXAM 5 (8.1-8.5, 9.1-9.3) • Worksheet 9.4-9.5 • ALEKS Objective #12 	<ul style="list-style-type: none"> • Exam 5 • Worksheet 	<ul style="list-style-type: none"> • Worksheet 9.4 – 9.5



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Week 17	1 - 7	Final Exam	Final	



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