



Fall 2019

**CHEM-C 101 Elementary Chemistry I**

Merrillville High School

<b>Credits</b>	C101: 3 cr	<b>College of Arts and Sciences Education CASE</b>	Natural & Mathematical Sciences N&M
<b>Instructor</b>	Mrs. Ruane	<b>Office</b>	F210
<b>Email</b>	mruane@mvsc.k12.in.us	<b>Office Hours</b>	Mon and Wednesday after school
<b>Meeting Times</b>		<b>Meeting Location</b>	F210
<b>Prerequisite(s)</b>	High school algebra	<b>Fees</b>	According to IU dual credit
<b>Course Description</b>	Essential principles of chemistry, atomic and molecular structure, bonding, properties and reactions of elements and compounds, stoichiometry, solutions, and acids and bases. For students who are not planning careers in the sciences and for those with no previous coursework in chemistry. Credit given for only one of C101 or C103.		
<b>Core Transfer Library Course</b>	Elementary General Chemistry w/Lab (with C121)		
<b>Textbook Title &amp; Author</b>	Introductory Chemistry: Atoms First, 5th Edition, By Steve Russo, Michael E. Silver, 2015		
<b>Learning Objectives</b>	<ul style="list-style-type: none"> <li>• Apply the scientific method correctly.</li> <li>• Recognize and use the fundamental mathematics and language of chemistry.</li> <li>• Learn about classification, measurement and changes of matter.</li> <li>• Learn about the concept of atoms, molecules and compounds.</li> <li>• Learn about the modern atomic theory and atomic trends that help explain bonding.</li> <li>• Learn how chemical bonds (ionic, covalent etc.) determine the properties of matter.</li> <li>• Learn about chemical nomenclature, mass relationships, molar masses, stoichiometry, and the gas laws.</li> <li>• Learn about the characteristics of solids, liquids, and gases from a macroscopic and microscopic perspective.</li> <li>• Apply the VSEPR model to determine a molecule's electronic geometry and molecular geometry based on its Lewis dot structure.</li> <li>• Identify polar and non-polar molecules based on dipole moment and molecular geometry.</li> <li>• Draw the best Lewis structure for a molecule or polyatomic ion, and predict and explain relative bond strength and lengths in a compound using the Lewis structure.</li> <li>• Define the three major intermolecular forces (IMF) that can exist in condensed phases: dipole-dipole, H-bonding, and dispersion forces.</li> </ul>		

	<ul style="list-style-type: none"> <li>• Predict the types of intermolecular forces that a compound can exhibit based on its structure.</li> <li>• Relate the IMFs of a compound to liquid properties such as boiling point, vapor pressure, viscosity, and surface tension.</li> <li>• Define a solution in terms of its concentration, predict which molecules are soluble in water versus non-polar substances, and understand at the molecular level what interactions are occurring when a compound is dissolved into solution.</li> <li>• Describe a system at chemical equilibrium and differentiate between reaction “completion” for irreversible and reversible reactions.</li> <li>• Describe how the rate of a chemical reaction changes as a function of time.</li> <li>• Define acids and bases, distinguishes between strong and weak acids and bases, understand the pH scale, and discusses some acid-base consumer issues.</li> <li>• To learn about the process and significance of chemical reactions, such oxidation and reduction.</li> <li>• To learn about nuclear chemistry and its applications.</li> </ul>																						
<b>Important Deadlines</b>	<b>Registration:</b> Monday, September 16 - Friday, September 27, 2019 <b>Drop date:</b> Friday September 27, 2019 <b>Withdrawal Date:</b> Friday April 17, 2020 or two weeks before the final exam (must be passing)																						
<b>How IU Grade will be Calculated</b>	<p>You will be graded on a straight-scale based on the assignments below. However, the scale is subject to change at the instructor’s discretion</p> <table border="1" data-bbox="326 835 1502 1297"> <thead> <tr> <th><i>Lecture Assignments</i></th> <th><i>Points</i></th> <th><i>% of grade</i></th> </tr> </thead> <tbody> <tr> <td>Exams (3-4 exams)</td> <td></td> <td>40-48%</td> </tr> <tr> <td>Quizzes ( @ points, drop 1 lowest each trimester)</td> <td></td> <td>12-15%</td> </tr> <tr> <td>Discussion worksheet/activities</td> <td></td> <td>15%</td> </tr> <tr> <td>Homework (worksheets)</td> <td></td> <td>10%</td> </tr> <tr> <td>Final Cumulative Exam</td> <td></td> <td>15-20%</td> </tr> <tr> <td><b>COURSE TOTAL</b></td> <td></td> <td><b>100%</b></td> </tr> </tbody> </table> <p>Exams and quizzes must account for 75% or greater of total grade with quizzes not being more than 15% of the grade. Final cumulative exam should count for 15-20% of final grade.</p> <p>Remaining 25% can be divided into homework/activities/worksheets/participation with no more than 5% being participation.</p>		<i>Lecture Assignments</i>	<i>Points</i>	<i>% of grade</i>	Exams (3-4 exams)		40-48%	Quizzes ( @ points, drop 1 lowest each trimester)		12-15%	Discussion worksheet/activities		15%	Homework (worksheets)		10%	Final Cumulative Exam		15-20%	<b>COURSE TOTAL</b>		<b>100%</b>
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<b>IU Grading Scale</b>	A+: 98-100%	C+: 77-79.9%																					
	A: 93-97.9%	C: 73-76.9%																					
	A-: 90-92.9%	C-: 70-72.9%																					
	B+: 87-89.9%	D+: 67-69.9%																					
	B: 83-86.9%	D: 63-66.9%																					
	B-: 80-82.9%	D-: 60-62.9%																					

<b>How High School Grade will be Calculated.</b> You high school grade is calculated per trimester. This will include your lab and lecture grade.	Exams (including lab)		30%
	Quizzes (drop 1 quiz each trimester)		20%
	Lab activities		20%
	Formal lab writeups		
	Homework (worksheets)		10%
	Final Exam		20%
	<b>COURSE TOTAL</b>		<b>100%</b>

<b>High School Grading Scale</b> Grading Scale: A = 90% B = 80% C = 70% D = 60% F = 59% or below
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**Schedule is subject to change. Please consult chemmom.weebly.com for calendar.**

<b>Schedule of Assignments</b>	Week 1	<ul style="list-style-type: none"> <li>- What is Chemistry?</li> <li>- Matter</li> <li>- Physical and Chemical Changes</li> <li>-Scientific method</li> </ul>	Chapter 1	Lab #1: Scientific method Safety/equipment/skills HW CH 1
	Week 2	<ul style="list-style-type: none"> <li>- Precision and Accuracy</li> <li>- Density of Solids and Liquids</li> <li>- Significant Figures</li> <li>- Uncertainty in Measurements</li> <li>- Scientific Notation</li> </ul>	Chapter 2	Quiz Ch 1 Lab #2 Precision and significant figures  HW CH 2 Lab/chapter2 Quiz
	Week 3	<ul style="list-style-type: none"> <li>- Structure of the Atom</li> <li>Mole concept.</li> </ul>	Chapter 3	Lab #3 Density lab Quiz Chapter 2 HW CH 3 Excel Assignment Chapter 3 Quiz
	Week 4 & 5	<ul style="list-style-type: none"> <li>- Chemical Periodicity</li> <li>- Modern Periodic Table</li> <li>- Ionization Energy</li> <li>- New Model of Atom</li> <li>- Quantized energy</li> <li>- Bohr Atom</li> <li>- Electron configurations</li> <li>- Compound formation</li> <li>- Quantum Mechanical Model</li> </ul>	Chapter 4 and 5	Mon/Tues After school review for Exam 1. HW CH 4 Lab #4 Flame test Lab Quiz Mid Week Chapter 1-3 Test Chapter 4 quiz first friday Chapter 5 quiz second friday
	Week 6	<ul style="list-style-type: none"> <li>- Ionic Bonding</li> <li>- Molecules and Covalent</li> </ul>	Chapter	

	compounds - Multiple bonds and Polar Bonds	6	Lab #4 activity ionic bonding Quiz Chapter 6
Week 7	- Molecular Shape - VSEPR - Molecular Polarity Intermolecular forces	Chapter 6	Lab #5 activity Lewis Structures and Molecular Shapes Homework assignment 6 Lecture Quiz #6 HW CH 6 Quiz Chapter 6
Week 8	- Nomenclature - Exceptions to Octet Rule (polyatomic ions)	Chapter 7	Mon/Tues After school review for Exam 2. Wednesday Exam chapter 3-6 Homework Chapter 7 Quiz Chapter 7
Week 9	- Combustion analysis - Percent Composition	Chapter 7	Lab #6 Tin oxide lab Homework Chapter 7 Quiz Chapter 7
Week 10	- Chemical Reaction - Balance chemical Equations	Chapter 8	Full lab write up due Chapter 8 Homework Chapter 8 quiz
Week 10	- Types of Reactions Acid base intro reactions	Chapter 8	Lab#7 Nail lab Homework chapter 8 Quiz Chapter 8
Week 11	- Solubility and Precipitation Reactions -Net Ionic equations	Chapter 8/13	HW CH 8 Homework chapter 8/13 Chapter 8/13 quiz
Week 12	Stoichiometry		Mon/Tues After school review for Exam 3. Lab Midterm
Final Exam First trimester			Chapter 7/8/13
Week 12/ 13	- Stoichiometry - Mole - Limiting Reactant	Chapter 9	Lab # 8 Stoichiometry/Limiting Reactants HW Chapter 9 Quiz Chapter 9

Week 14/15	<ul style="list-style-type: none"> <li>- Gas Laws</li> <li>- Ideal Gas Law</li> <li>- Deviations from ideality</li> </ul>	Chapters 10/11	Lab# 9 Boyle's Each week: HW CH 10/11 Quiz Chapter 10/11
Week 15/16	<ul style="list-style-type: none"> <li>- Solution</li> <li>- Energy and Solution Formation</li> <li>- Entropy</li> <li>- Solubility, Temperature and Pressure</li> </ul>	Chapter 12	Mon/Tues After school review for Exam 4. Lab 10 molarity Wednesday Exam4 chapter 9-11 HW CH 12 Quiz Chapt12
Week 15/16	<ul style="list-style-type: none"> <li>- Molarity</li> <li>- Reactions in Solution</li> <li>- Colligative Properties</li> </ul>	Chapter 12	Lab #11: Beers Law HW CH 12 Quiz Chapt12
Week 15/16	<ul style="list-style-type: none"> <li>- Electrolytes and nonelectrolytes</li> <li>- Weak and Strong electrolytes/acids</li> <li>- Bases</li> </ul>	Chapter 13	HW CH 13 Quiz Chapter 13
Week 17	<ul style="list-style-type: none"> <li>- Chemical Kinetics</li> <li>- Reaction Rates</li> <li>- Reaction Order</li> </ul>	Chapter 17	Exam #5 Lab #12: Kinetics HW CH 17 Quiz Chapter 17
Week 18	<ul style="list-style-type: none"> <li>- Dynamic Equilibrim</li> <li>- Equilibrium Position</li> <li>- Le Chatelier's Principle</li> <li>- Solubility and</li> <li>- Equilibrium Calculations</li> </ul>	Chapter 18	Mon/Tues After school review for Exam 5. Lab #13: Stresses Applied to Equilibrium Systems HW CH 18 Wednesday Exam 5 Chapter 12, 13 and 17 Quiz Chapter 18
Week 19/20	<ul style="list-style-type: none"> <li>- Definitions of Acids/Bases</li> <li>- <math>K_w</math></li> <li>- pH Scale</li> <li>- Buffers</li> </ul>	Chapter 15	Lab 14 titration HW CH 15 Quiz Chapter 15
Week 20/21	<ul style="list-style-type: none"> <li>- Oxidation States</li> <li>- Redox</li> <li>- EMF Series</li> </ul>	Chapter 19	Lab 15 Redox HW CH 19 Quiz Chapter 19 Mon/Tues After school review for Exam 6. Wed Exam 6 Chapter 17/18/15
Week 22	Nuclear	Chapter 21	Lab 16 Nuclear decay HW CH 21 Quiz Chapter 21

	Week 23/24	- Extra Time and Final Prep	Finals	Lab Exam #2 Final
<b>Classroom Policies &amp; Information</b>	<p>No phones or electronic devices may be use in class unless specifically stated by the teacher. Phones will be held until the end of class for the first offense and then will be sent to the office for subsequent offenses.</p> <p><b>This is a college class with a college pace. You should be working a minimum of one hour at home for every hour in class. This includes reading ahead and preparing for exams. Exams cover more than one chapter. You will need to be reviewing all material every week to do well on the exams and on the second trimester cumulative exam.</b></p>			
<b>Attendance Policy</b>	<p>Students are expected to attend all classes and be on time each day. If an absence is unavoidable, the student is expected to notify Mrs. Ruane in person and turn in missed work the first day back from school. You are responsible obtaining and finishing all missing work. You should be bringing home chemistry every day so you can prepare for all work during any absence.</p>			
<b>Late Work Policy</b>	<p>10% off for one day late work, then 50% off. No work will be accepted after the unit is over.</p>			
<b>Make-up/Retake Exam Policy</b>	<p><b>You must make up your exam the day you get back in class.</b> You are responsible obtaining and finishing all missing work. You should be bringing home chemistry every day so you can prepare for all work during any absence.</p>			
<b>Dual Credit-High School Credit Policy Statement</b>	<p>The rigor of this course will be periodically reviewed by Indiana University faculty in an effort to maintain the high quality of education that each student receives. Due to the unique format of this course, students must decide during the IU enrollment period whether they wish to receive dual credit (high school and IU credit) or only high school credit. Students who choose to take the course only for high school credit and receive a passing grade may <b>not</b> register at a later date or repeat the course (while in high school) for college credit.</p>			
<b>IU Academic Misconduct Statement</b>	<p>The rights and responsibilities of Indiana University students are explained in the <i>Indiana University Code of Student Rights, Responsibilities, and Conduct</i>, <a href="http://www.indiana.edu/~code/">http://www.indiana.edu/~code/</a>. The Code describes the types of misconduct for which students may be penalized, including cheating, fabrication, plagiarism and interference with other students' work, as well as actions which endanger the University and the University community and possession of firearms. The Code also indicates the procedures to be followed in these cases. <b>All students are required to adhere to the responsibilities outlined in the Code</b></p> <p>The definition and clarification related to academic misconduct is here:  <a href="http://www.indiana.edu/~code/code/responsibilities/academic/index.shtml">http://www.indiana.edu/~code/code/responsibilities/academic/index.shtml</a></p> <p>Examples of Plagiarism: <a href="http://www.indiana.edu/~wts/pamphlets/plagiarism.pdf">http://www.indiana.edu/~wts/pamphlets/plagiarism.pdf</a></p> <p>Per IU policy, ACP instructors are required to investigate and then report all incidents of academic misconduct to the Dean of Students.</p> <p><i>Adopted by the Board of Trustees, effective August 1, 2009</i></p>			