

**NATURAL SCIENCES**  
**Institutional (ILO), Program (PLO), and Course (SLO) Alignment**

Program: <b>Chemistry</b>	<b>Number of Courses:</b> 8	<b>Date Updated:</b> 10.02.2014	<b>Submitted by:</b> T. Jim Noyes, ext. 3356
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<b>ILOs</b>	<b>1. Critical Thinking</b> <i>Students apply critical, creative and analytical skills to identify and solve problems, analyze information, synthesize and evaluate ideas, and transform existing ideas into new forms.</i>	<b>2. Communication</b> <i>Students effectively communicate with and respond to varied audiences in written, spoken or signed, and artistic forms.</i>	<b>3. Community and Personal Development</b> <i>Students are productive and engaged members of society, demonstrating personal responsibility, and community and social awareness through their engagement in campus programs and services.</i>	<b>4. Information Literacy</b> <i>Students determine an information need and use various media and formats to develop a research strategy and locate, evaluate, document, and use information to accomplish a specific purpose. Students demonstrate an understanding of the legal, social, and ethical aspects related to information use.</i>
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**SLO-PLO-ILO ALIGNMENT NOTES:**

*Mark boxes with an 'X' if: SLO/PLO is a major focus or an important part of the course/program; direct instruction or some direct instruction is provided; students are evaluated multiple times (and possibly in various ways) throughout the course or are evaluated on the concepts once or twice within the course.*

*DO NOT mark with an 'X' if: SLO/PLO is a minor focus of the course/program and some instruction is given in the area but students are not formally evaluated on the concepts; or if the SLO/PLO is minimally or not at all part of the course/program.*

<b>PLOs</b>	<b>PLO to ILO Alignment</b>			
	<i>(Mark with an X)</i>			
	1	2	3	4
<b>PLO #1 Equation Writing</b> Students will be able to express chemical reaction word problems in the correct format.	X	X		
<b>PLO #2 Structural Representations of Compounds</b> Students will be able to represent the structures of compounds based on chemical bonding theory.	X	X		
<b>PLO #3 Lab Safety</b> Students will take the necessary precautions to ensure proper laboratory safety.		X	X	

SLOs	SLO to PLO Alignment <i>(Mark with an X)</i>			COURSE to ILO Alignment <i>(Mark with an X)</i>			
	P1	P2	P3	1	2	3	4
<b>CHEM 1A General Chemistry I: SLO #1 Equation Writing</b> On a written exercise, given the names of chemical compounds, students will be able to write the correct reactant formulas, states of matter (when required), identify reaction type, predict the product formulas and balance the chemical equation.	X			X	X	X	
<b>CHEM 1A General Chemistry I: SLO #2 Structural Representations of Compounds</b> Students will be able to create (via molecular models or drawings) accurate representations of compounds. The representations will contain appropriate bonds, lone pairs, and geometry.		X					
<b>CHEM 1A General Chemistry I: SLO #3 Content Knowledge (Mitosis)</b> Students will adhere to safety protocol in the laboratory regarding eye protection. Students will follow the proper procedure regarding wearing goggles in the laboratory, and keeping them on to protect their eyes.			X				
<b>CHEM 2A General Chemistry II: SLO #1 Equation Writing</b> On a written exercise, given the names of chemical compounds, students will be able to write the correct reactant formulas, states of matter (when required), identify reaction type, predict the product formulas and balance the chemical equation.	X			X	X	X	
<b>CHEM 2A General Chemistry II: SLO #2 Structural Representations of Compounds</b> Students will be able to create (via molecular models or drawings) accurate representations of compounds. The representations will contain appropriate bonds, lone pairs, and geometry.		X					
<b>CHEM 2A General Chemistry II: SLO #3 Content Knowledge (Mitosis)</b> Students will adhere to safety protocol in the laboratory regarding eye protection. Students will follow the proper procedure regarding wearing goggles in the laboratory, and keeping them on to protect their eyes.			X				
<b>CHEM 20 Fundamentals of Chemistry: SLO #1 Chemical Formulas of Reactants</b> On a written exercise, given the chemical formulas of reactants, students will be able to write the correct formulas of products, identify the reaction type and balance the equation.	X			X	X	X	
<b>CHEM 20 Fundamentals of Chemistry: SLO #2 Molecular Models and Drawings</b> Students will be able to create (via molecular models or drawings) accurate representations of compounds. The representations will contain appropriate bonds, lone pairs, and geometry.		X					
<b>CHEM 20 Fundamentals of Chemistry: SLO #3 Safety Protocol</b> Students will adhere to safety protocol in the laboratory regarding eye protection. Students will follow the proper procedure regarding wearing goggles in the laboratory, and keeping them on to protect their eyes.			X				

SLOs	SLO to PLO Alignment <i>(Mark with an X)</i>			COURSE to ILO Alignment <i>(Mark with an X)</i>			
	P1	P2	P3	1	2	3	4
<b>CHEM 21A Survey of General and Organic Chemistry: SLO #1 Names of Chemical Compounds</b> On a written exercise, given the names of chemical compounds, students will be able to write the correct reactant formulas, states of matter (when required), identify reaction type, predict the product formulas and balance the chemical equation.	X			X	X	X	
<b>CHEM 21A Survey of General and Organic Chemistry: SLO #2 Molecular Models and Drawings</b> Students will be able to create (via molecular models or drawings) accurate representations of compounds. The representations will contain appropriate bonds, lone pairs, and geometry.		X					
<b>CHEM 21A Survey of General and Organic Chemistry: SLO #3 Safety Protocol</b> Students will adhere to safety protocol in the laboratory regarding eye protection. Students will follow the proper procedure regarding wearing goggles in the laboratory, and keeping them on to protect their eyes.			X				
<b>CHEM 21B Survey of Organic and Biochemistry: SLO #1 Structures of Reactants for a Reaction</b> On a written exercise, given the structures of reactants for a reaction, students will be able to write the correct structures of products and identify the reaction type.	X			X	X	X	
<b>CHEM 21B Survey of Organic and Biochemistry: SLO #2 Molecular Models and Drawings</b> Students will be able to create (via molecular models or drawings) accurate representations of compounds. The representations will contain appropriate bonds, lone pairs, and geometry.		X					
<b>CHEM 21B Survey of Organic and Biochemistry: SLO #3 Safety Protocol</b> Students will adhere to safety protocol in the laboratory regarding eye protection. Students will follow the proper procedure regarding wearing goggles in the laboratory, and keeping them on to protect their eyes.			X				
<b>CHEM 4 Beginning Chemistry: SLO #1 Equation Writing</b> On a written exercise, given the names of chemical compounds, students will be able to write the correct reactant formulas, states of matter (when required), identify reaction type, predict the product formulas and balance the chemical equation.	X			X	X	X	
<b>CHEM 4 Beginning Chemistry: SLO #2 Structural Representations of Compounds</b> Students will be able to create (via molecular models or drawings) accurate representations of compounds. The representations will contain appropriate bonds, lone pairs, and geometry.		X					
<b>CHEM 4 Beginning Chemistry: SLO #3 Lab Safety</b> Students will adhere to safety protocol in the laboratory regarding eye protection. Students will follow the proper procedure regarding wearing goggles in the laboratory, and keeping them on to protect their eyes.			X				

SLOs	SLO to PLO Alignment <i>(Mark with an X)</i>			COURSE to ILO Alignment <i>(Mark with an X)</i>			
	P1	P2	P3	1	2	3	4
<b>CHEM 7A Organic Chemistry I: SLO #1 Equation Writing</b> On a written exercise, given the structures of reactants for a reaction, students will be able to write the correct structures of products and identify the reaction type.	X			X	X	X	
<b>CHEM 7A Organic Chemistry I: SLO #2 Structural Representations of Compounds</b> Students will be able to create (via molecular models or drawings) accurate representations of compounds. The representations will contain appropriate bonds, lone pairs, and geometry.		X					
<b>CHEM 7A Organic Chemistry I: SLO #3 Lab Safety</b> Students will adhere to safety protocol in the laboratory regarding eye protection. Students will follow the proper procedure regarding wearing goggles in the laboratory, and keeping them on to protect their eyes.			X				
<b>CHEM 7B Organic Chemistry II: SLO #1 Equation Writing</b> On a written exercise, given the structures of reactants for a reaction, students will be able to write the correct structures of products and identify the reaction type.	X			X	X	X	
<b>CHEM 7B Organic Chemistry II: SLO #2 Structural Representations of Compounds</b> Students will be able to create (via molecular models or drawings) accurate representations of compounds. The representations will contain appropriate bonds, lone pairs, and geometry.		X					
<b>CHEM 7B Organic Chemistry II: SLO #3 Lab Safety</b> Students will adhere to safety protocol in the laboratory regarding eye protection. Students will follow the proper procedure regarding wearing goggles in the laboratory, and keeping them on to protect their eyes.			X				