

## X10 Rotational Plan for Active SLOs

Course ID	CSLO Name	CSLO Assessment Cycle	CSLO
CHEMV01A	CSLO-1	201207 (Fall 2012)	Balance Chemical equations and solve general Chemistry problems by applying the scientific method including developing hypotheses, hypotheses testing and evaluation.
	CSLO-2	201403 (Spring 2014)	Calculate quantities involving chemical equations including using chemical symbols, IUPAC nomenclature, balancing reactions and stoichiometry.
	CSLO-3	201607 (Fall 2016)	Use Chemical concepts such as enthalpy, VSEPR theory, changes of state, and colligative properties to determine the physical properties of substances.
	ISLO-3	201503 (Spring 2015)	Critical Thinking and Competency
CHEMV01AL	CSLO-1	201703 (Spring 2017)	Understand laboratory procedures, safety, scientific method and lab notebook recording.
	CSLO-2	201603 (Spring 2016)	Understand the concepts of random error, systematic error, precision and accuracy, and their relationship to significant figures.
	CSLO-3	201207 (Fall 2012)	Master Chemical laboratory techniques such as measurement, determination of density, pipetting, titration, and spectroscopy.
	ISLO-2	201207 (Fall 2012)	Scientific and Quantitative Reasoning
CHEMV01B	CSLO-1	201403 (Spring 2014)	Use kinetic data to formulate chemical mechanisms and analyze the results using thermodynamic arguments.
	CSLO-2	201207 (Fall 2012)	Understand the concepts of equilibrium and the equilibrium constant as it pertains to acids, bases, titrations, and solubility product.
	CSLO-3	201607 (Fall 2016)	Be able to apply the Nernst Equation to non-equilibrium systems and relate it to thermodynamic principles.
	ISLO-3	201503 (Spring 2015)	Critical Thinking and Problem Solving
CHEMV01BL	CSLO-1	201703 (Spring 2017)	Evaluate a chemical reaction system to determine how chemical equilibria will be altered by changes in temperature, concentration, or pressure by applying LeChatelier's principle.
	CSLO-2	201207 (Fall 2012)	Experiment with rate dependence on temperature and calculate activation energy from experimental data analysis.
	CSLO-3	201603 (Spring 2016)	Test common hydrocarbons and organic compounds to identify what functional groups are present.
	ISLO-2	201307 (Fall 2013)	Reasoning--Scientific and Quantitative
CHEMV12A	CSLO-1	201207 (Fall 2012)	Categorize, arrange and assemble structures of alkanes, alkenes, alkynes alkyl halides, alicyclics, alcohols, ethers and aromatics using IUPAC, derived and common systems of nomenclature.
	CSLO-2	201307 (Fall 2013)	Examine, evaluate and formulate mechanisms for the reactions of alkanes, alkenes, alkynes, alkyl halides, alcohols and aromatics given reactant and target compounds. They will also be required to propose alternate steps in reaction mechanisms for common reactions.
	CSLO-3	201507 (Fall 2015)	Examine, evaluate and formulate appropriate multi-step synthetic pathways leading to target compounds involving alkanes, alkenes, alkynes, alkyl halides, alcohols and aromatics.
	CSLO-4	201607 (Fall 2016)	Evaluate spectra (infrared, mass, HNMR, CNMR, UV) to formulate structures for organic compounds involving alkanes, alkenes, alkynes, alkyl halides, alcohols and aromatics.
CHEMV12AL	ISLO-3	201407 (Fall 2014)	Critical Thinking and Problem Solving
	CSLO-1	201507 (Fall 2015)	Synthesize simple organic molecules using modern reaction techniques and analyze the success of each synthesis on the basis of gravimetric, spectroscopic, and chromatographic evidence and physical properties.
	CSLO-2	201207 (Fall 2012)	Analyze unknown substances using qualitative Chemical tests and to confirm the analysis using the

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	CSLO-2	201207 (Fall 2012)	interpretation of infrared, nuclear magnetic resonance, and gas chromatography-mass spectroscopy.
	ISLO-2	201307 (Fall 2013)	Reasoning, Scientific and Quantitative
CHEMV12B	CSLO-1	201403 (Spring 2014)	Categorize, arrange, and assemble structures of aromatics, ketones, aldehydes, carboxylic acids, esters, amines, and biochemical amino acids using IUPAC and common systems of nomenclature, in addition to continued ChemV12A knowledge.
	CSLO-2	201703 (Spring 2017)	Examine, evaluate, and formulate mechanisms for the reactions of aromatics, ketones, aldehydes, carboxylic acids, esters, and amines given reactants and reagents; in addition to continued ChemV12A knowledge.
	CSLO-3	201603 (Spring 2016)	Ability to propose the multi-step synthesis for common functional groups using all learned reagents from ChemV12 and ChemV12B.
	CSLO-4	201703 (Spring 2017)	Evaluate spectra (infrared, msas spec, H1 NMR, C13 NMR) to formulate structures for alkanes, alkenes, alkynes, alkyl halides, cyclics, alcohols, ethers, ketones, aldehydes, carboxylic acids, esters, amines, and aromatics.
	ISLO-3	201503 (Spring 2015)	Critical Thinking and Problem Solving
CHEMV12BL	CSLO-1	201603 (Spring 2016)	Synthesize organic molecules using modern reaction techniques and analyze the success of each synthesis on the basis of gravimetric, spectroscopic, and chromatographic evidence and physical properties.
	CSLO-2	201703 (Spring 2017)	Analyze unknown substances using qualitative Chemical tests and to confirm the analysis using the interpretation of infrared, nuclear magnetic resonance, and gas chromatography-mass spectroscopy.
	ISLO-2	201403 (Spring 2014)	Reasoning--Scientific and Quantitative
CHEMV20	CSLO-1	201207 (Fall 2012)	Solve quantitative Chemistry problems using various mathematical procedures including dimensional analysis and algebraic equations, and demonstrate clear reasoning in their work.
	CSLO-2	201307 (Fall 2013)	Explain the basic structure of atoms and molecules and describe how atoms combine to form compounds.
	CSLO-3	201603 (Spring 2016)	Describe how the structure of atoms and molecules leads to the macroscopic properties of a material such as reactivity, boiling point, melting point, and polarity.
	CSLO-4	201703 (Spring 2017)	Analyze, predict, and represent Chemical changes using knowledge of Chemical formulas, solubility rules, periodic trends, stoichiometry, and Chemical equations
	ISLO-3	201503 (Spring 2015)	Critical Thinking and Problem Solving
CHEMV20L	CSLO-1	201703 (Spring 2017)	Perform laboratory techniques correctly following written protocols and using appropriate safety procedures.
	CSLO-2	201603 (Spring 2016)	Evaluate sources of error, and their effect on experiment results
	CSLO-3	201607 (Fall 2016)	Perform careful and accurate laboratory measurements and correlate these measurements with scientific laws, and the properties of substances.
	ISLO-2	201403 (Spring 2014)	Reasoning--Scientific and Quantitative
CHEMV21	CSLO-1	201607 (Fall 2016)	Solve organic and biochemistry problems by applying the scientific method including developing hypotheses, hypotheses testing and evaluation.
	CSLO-2	201507 (Fall 2015)	Know the IUPAC names and the structures of alkanes, alkenes, alkynes, alcohols, ethers, thiols, benzene and aromatic compounds, amines, aldehydes, ketones, carboxylic acids, esters, amides, acid anhydrides and polyfunctional molecules.
	CSLO-3	201703 (Spring 2017)	Understand the process of DNA replication, transcription, translation, mutation and polymerase chain reaction; as well as the processes of catabolism and anabolism.
	ISLO-3	201407 (Fall 2014)	Critical Thinking and Problem Solving
CHEMV21L	CSLO-1	201503 (Spring 2015)	Understand laboratory procedures, safety, scientific method and lab notebook recording.

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	CSLO-2	201603 (Spring 2016)	Master techniques for organic Chemistry reactions, synthesis, chromatography and quantitative analysis.
	CSLO-3	201707 (Fall 2017)	Master biochemical laboratory procedures for isolating and identifying DNA.
CHEMV30	ISLO-2	201307 (Fall 2013)	Reasoning, Scientific and Quantitative
	CSLO-1	201803 (Spring 2018)	Describe the structure and composition of matter, and use knowledge of the particulate structure of matter in order to predict and explain macroscopic properties.
	CSLO-2	201603 (Spring 2016)	Solve quantitative Chemistry problems using dimensional analysis and algebraic equations involving the mole, pH, unit conversions, and other concepts.
	CSLO-3	201703 (Spring 2017)	Classify organic molecules, predict their properties based on their formula and structure, and represent their characteristic reactions.
CHEMV30L	ISLO-3	201407 (Fall 2014)	Critical Thinking and Problem Solving
	CSLO-1	201503 (Spring 2015)	Perform laboratory techniques correctly following written protocols and using appropriate safety procedures.
	CSLO-2	201603 (Spring 2016)	Analyze the results of laboratory experiments quantitatively.
	CSLO-3	201703 (Spring 2017)	Perform experiments with organic compounds and use the results of these experiments to classify, and predict the behavior of organic compounds.
	ISLO-2	201307 (Fall 2013)	Reasoning--Scientific and Quantitative