



Course Competency Report by Code

Code: AIC2

Organic and Integrated Chemistry (AIC2)

Course of Study: COC1 - Organic and Integrated Chemistry

Course Level: Graduate

Course Division: First Year Master's

Discipline: General Natural Science

Course Type:

Department: Science

COMPETENCY #	COMPETENCY NAME	COMPETENCY TEXT
208.1.2	Carbon Compounds and Chemical Bonds	The graduate can calculate formal charges and organic shorthand notation, and demonstrate basic concepts of chemical bonding.
208.1.3	Organic Compounds	The graduate can solve problems using critical concepts of orbital structure, molecular formula, boiling, and solubility.
208.1.4	Organic Reactions: Acids and Bases	The graduate can solve acid/base problems, and determine equilibrium concentration, using Bronsted-Lowry and Lewis acid-base concepts.
208.1.5	Stereochemistry Chiral Molecules	The graduate can apply concepts of stereochemistry to real-life situations, construct models of chiral and achiral molecules, and determine structure of molecules.
208.1.6	Alkanes and Cycloalkanes-Conformations	The graduate can analyze, draw, and solve problems concerning the conformations of alkanes and cycloalkanes.
208.1.7	Ionic Reactions, Nucleophilic Substitutions, and Elimination Reactions of Alkyl Halides	The graduate can determine the structures of compounds and solve reaction problems with alkenes.
208.1.8	Alkenes and Alkynes Reactions	The graduate demonstrates the importance of alkenes in organic chemistry, and solves reaction problems of alkenes.
208.1.9	Alcohols and Ethers	The graduate can solve reaction equations and draw structures for alcohols and ethers.
208.1.10	Mass Spectrometry and Other Lab Techniques in Organic Chemistry	The graduate can demonstrate how mass spectrometers work, how they provide key information about molecular structure, and demonstrate other important lab techniques.
208.1.11	Aromatic Compounds	The graduate can explain the relationship between aromatic compounds and conjugated systems, construct models and identify structures, and solve problems of aromatic compounds.



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208.1.12	Aldehydes and Ketones I	The graduate can construct chemical models, write chemical equations for common aldehyde and ketone reactions, and distinguish between aldehydes and ketones.
208.1.13	Carboxylic Acids and Their Derivatives	The graduate can draw chemical structures of carboxylic acids and their derivatives, name, solve problems involving carboxylic acids, and use tests to distinguish acids.
208.2.1	First Law of Thermodynamics	The graduate applies the first law of thermodynamics to analyze heat transfers associated with chemical processes and changes in state.
208.2.2	Second Law of Thermodynamics	The graduate applies concepts of the second law of thermodynamics and free energy to predict the spontaneity of a process and analyze chemical equilibrium.
208.2.3	Chemical Equilibrium	The graduate solves problems of equilibrium and determines the effect of catalysts on a system at equilibrium.
208.2.7	Electrochemistry	The graduate applies concepts of thermodynamics and electrochemistry to analyze the interchange of chemical and electrical energy.
208.3.1	Atomic Structure	The graduate analyzes atomic structure and can demonstrate major principles and rules of atomic structure.
208.3.2	Periodic Trends	The graduate demonstrates that groups of elements possess similar physical and chemical properties and can determine trends using the periodic chart.
208.3.3	Bonding Models	The graduate demonstrates how atoms or ions in minerals are glued together by electrical bonds that are ionic or covalent, and computes the bond order in a molecule.
208.3.4	Complex Ions and Coordination Compounds	The graduate demonstrates properties of compounds and constructs models of bonding compounds and complex ions.
208.3.5	Solid State	The graduate demonstrates the microscopic and macroscopic features of solids and demonstrates how crystallography informs solid state chemistry.