**Chem V12A General Organic Chemistry I**

1. Categorize, arrange, and assemble structures of alkanes, alkenes, alkynes, alkyl halides, cyclics, alcohols, and ethers using IUPAC and common systems of nomenclature.
2. Examine, evaluate, and formulate mechanisms for the reactions of alkanes, alkenes, alkynes, alkyl halides, cyclics, alcohols, and ethers given reactants and reagents.
3. Ability to propose the multi-step synthesis for common functional groups using learned reagents. (*heavy emphasis on synthesis*)
4. Evaluate spectra (Infrared & Mass Spec) to formulate structures for alkanes, alkenes, alkynes, alkyl halides, cyclics, alcohols, ethers, and ketones, aldehydes, carboxylic acids, esters, and aromatics.

**Chem V12AL**

1. Synthesize simple organic molecules using modern reaction techniques.
2. Analyze the success of each synthesis on the basis of gravimetric, spectroscopic, and chromatographic evidence and physical properties.
3. Analyze unknown substances using qualitative chemical tests and to confirm the analysis using the interpretation of infrared spectroscopy, gas chromatography, and mass spectroscopy.

**Chem V12B General Organic Chemistry II**

1. 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 Chem V12A knowledge.
2. 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 Chem V12A knowledge.
3. Ability to propose the multi-step synthesis for common functional groups using all learned reagents from Chem V12A and V12B. (*heavy emphasis on synthesis*)
4. Evaluate spectra (Infrared, Mass Spec, H1 NMR, C13 NMR) to formulate structures for alkanes, alkenes, alkynes, alkyl halides, cyclics, alcohols, ethers, and ketones, aldehydes, carboxylic acids, esters, amines, and aromatics.

**Chem V12BL**

1. Synthesize simple organic molecules using modern reaction techniques with an emphasis on micro-techniques.
2. Analyze the success of each synthesis on the basis of gravimetric, spectroscopic, and chromatographic evidence and physical properties.
3. Analyze unknown substances using qualitative chemical tests and to confirm the analysis using the interpretation of infrared spectroscopy, gas chromatography, and nuclear magnetic resonance spectroscopy.

**Chem V01A General Chemistry 1**

1. Balance Chemical equations and solve general Chemistry problems by applying the scientific method including developing hypotheses, hypotheses testing and evaluation.
2. Use Chemical concepts such as enthalpy, VSEPR theory, changes of state, and colligative properties to determine the physical properties of substances.
3. Calculate quantities involving Chemical equations including using Chemical symbols, IUPAC nomenclature, balancing reactions and stoichiometry.