MSc. ANALYTICAL CHEMISTRY

**SCA 3116E:    [SPECIAL TOPICS IN INORGANIC CHEMISTRY](https://uwaterloo.ca/graduate-studies-academic-calendar/node/2651" \t "_blank)**

Prerequisite: N/A

**Purpose**

To acquire knowledge in some selected topics in inorganic chemistry of relevance to applications of analytical chemistry

**Expected Learning Outcomes**

At the end of this unit, the students should be able to:

1.      Describe the recent advances in synthesis and reaction of transition metal complexes

2.      Describe recent advances in heterogeneous and homogenous catalysis

3.      Apply quantitative and qualitative methods in analysis of inorganic materials

**Course Description**

Recent advances in the Chemistry of transition and non-transition elements: synthesis of inorganic complexes *via* oxidation and reduction reactions, substitution reactions, solvolysis reactions, disproportional reactions and photochemical reactions, uses of the complexes; Substitution reactions of tetrahedral, square planar, five coordinate and octahedral complexes: Trans effects, Molecular rearrangements process, electron-transfer reactions, elimination and substitution reactions, reactions of coordinated ligands; Factors affecting stability of metal complexes; Techniques for handling both air and moisture sensitive materials; Recent advances in heterogeneous and homogeneous catalysis (design of experiments, analytical techniques employed in quantification); Suitable solvents for inorganic synthesis; Elemental analysis, spectroscopy and diffraction techniques in determination of molecular formulae for inorganic complexes; Qualitative and quantitative analysis of mixtures of salts by semi-micro methods; Synthesis of inorganic compounds and structure determination by modern methods; chemistry of polynuclear compounds.