

# Course Outline for CHEM760/7600 (Fall 2017)

## Synthetic Methods in Organic and Organometallic Chemistry

---

### Course description

This course will familiarize students with the basics of main group and transition metal chemistry (formalisms) and provide a practical introduction to the mechanisms of organometallic reactions. The importance of main group- and transition metal-catalyzed bond-forming processes in organic synthesis will be illustrated with examples of applications in the synthesis of natural products.

### Course learning objectives

The emphasis of this course is on the *development of problem solving skills* in the context of bond-breaking/bond-making reactions and organometallic mechanisms. The student will gain and demonstrate *an understanding of the relationship between the structure of an organic molecule/organometallic complex and its reactivity*.

### Contact information

Eric Fillion, Office C2-390; Email: [efillion@uwaterloo.ca](mailto:efillion@uwaterloo.ca); Ext. 32470

Tuesday 7:00-9:20 PM; Room: Main-Link

**Office hours:** If you have difficulties with specific concepts, and to facilitate your understanding and learning of course material. I will be available in my office to answer your questions from tba. Alternative times may be arranged if necessary. Appointment may be setup by email.

### Resources

*Transition Metals in the Synthesis of Complex Organic Molecules* (3rd Edition) by Louis S. Hegedus and Björn C. G. Söderberg (University Science Book, 2010).

*Organotransition Metal Chemistry From Bonding to Catalysis* by John F. Hartwig (University Science Book, 2010) .

### Course topics

The chemistry of  $\sigma$ -alkylmetal complexes, transition metal carbonyl and carbene complexes, and transition metal alkene, and alkyne complexes as well as the chemistry of frustrated Lewis pairs will be discuss in details.