Part I. Basic Organometallic Reactions
Structure and bonding, Classes of ligands, Complexes with $\sigma$-bound ligands, Complexes with $\pi$-bound ligands, Ligand substitution, Oxidative addition and reductive elimination, Migratory insertion and $\beta$-elimination, Nucleophilic and electrophilic attack on coordinated ligands

Part II. Industrial Homogenous Catalysis
Hydrogenation, Hydroformylation, Hydrocarboxylation, Hydrosilylation, Hydrocyanation, Polymerization, Metathesis, Oxidation

Part III. Organometallics for Organic Synthesis
Metal hydrides, Metal-carbon $\sigma$-bonds, Metal carbonyl complexes, Metal carbene complexes, Metal alkene complexes, Metal alkyne complexes, Allyl metal complexes, Metal arene complexes, Asymmetric hydrogenation, Isomerization, Cyclopropanation, Oxidation, Carboxylation, Hydrosilylation, Carbon-carbon bond forming Reactions, Asymmetric Catalysis

Text: G. O. Spessard, G. L. Miessler “Organometallic Chemistry” Prentice-Hall, New Jersey,

L. S. Hegedus "Transition Metals in the Synthesis of Complex Organic Molecules" University Science Books

Organometallic Chemistry by John Hartwig and others are helpful

Strem Catalog on "Metal Catalysts for Organic Synthesis" is recommended

We will have three exams. Each one counts 1/3 of your score.