

## CHEM 425 Syllabus

Course Code	Course Name	Credits	Prerequisite(S)	Classification
CHEM 425	Organometallic Chemistry	2	CHEM 322	<b>Elective</b> Course

### Course Description

An introduction to main group and *d*-block organometallic Chemistry.

### Class

Classes are held 2 times/week each for 50 minutes.

### Scheduling

### Textbook

"Inorganic Chemistry" by D.F. Shriver, P.W. Atkins, 2000, Oxford university press, 3rd edition.

"Organometallic Chemistry of the transition metals" by Robert H. Crabtree, 2001, John Wiley and Sons: New York, 3rd edition

### Course

#### Coordinator

Prof. Dr. Elham Aazam

Prof. Dr. Mutlaq Aljahdali

### Relationship to SOs

1	2	3	4	5	6
X					X

### CLOs

By the end of this course student will be able to:

**CLO1.** Identify Organometallic compounds by knowing their structures, name, bonding and handling. (SO1)

**CLO2.** Compare organometallic compounds and hydrogen compounds. (SO1)

**CLO3.** Estimate the number of CO stretching bands in the IR spectrum to elucidate the structure. (SO1)

**CLO4.** Analyze different types of organometallic synthesis and reactions. (SO1)

**CLO5.** Apply 18 electron rule and cluster valence electrons count using Wade-Mingos rules. (SO1)

**CLO6.** Search recent papers in the field of catalysis of Organometallic Complexes. (SO6)

**Contents**

List of Topics	No. of Weeks
Introduction to organometallic compounds, classification, nomenclature and comparison with hydrogen compounds	1
Physical properties, structure, bonding and stability of organometallic compounds.	1
Synthesis and Reaction patterns of main group organometallic compounds and techniques for handling air sensitive compounds	2
Ionic and electron-deficient compounds of Groups 1, 2 , 12 and Radical anion salts	1
Alkaline earth metals, their reactions and the Zinc group	1
Introduction, nomenclature bonding of d-block O.M. Compounds	1
The 18-electron rule. The ionic and covalent models. The sixteen-electron complexes. Exceptions to the 16/18 electron rule	2
Metal carbonyls Molecular Orbital approach, structures from IR data	2
Properties and reactions of metal carbonyls	1
Metal clusters, electron count and structure	1
Catalysis of organometallic compounds	2