

COURSE IMPLEMENTATION DATE:	January 1995
COURSE REVISED IMPLEMENTATION DATE:	September 2007
COURSE TO BE REVIEWED:	March 2011
(Four years after implementation date)	(MONTH YEAR format)

**OFFICIAL COURSE OUTLINE INFORMATION**

Students are advised to keep course outlines in personal files for future use.

Shaded headings are subject to change at the discretion of the department and the material will vary - see course syllabus available from instructor

FACULTY/DEPARTMENT:	Faculty of Science, Health & Human Services/Chemistry	
<b>CHEM 421</b>		<b>4</b>
COURSE NAME/NUMBER	FORMER COURSE NUMBER	UCFV CREDITS
	<b>Advanced Inorganic Chemistry</b>	
COURSE DESCRIPTIVE TITLE		

**CALENDAR DESCRIPTION:**

This course concentrates on organo-transition metal chemistry, with emphasis on bonding theories, the 18-electron rule, and cluster compounds. Emphasis is also placed on the role of organometallic complexes in organic syntheses. The experiments performed in the laboratory component of the course will be directly related to the topics discussed during lectures.

PREREQUISITES: **CHEM 321**  
COREQUISITES:

SYNONYMOUS COURSE(S)	<b>SERVICE COURSE TO:</b>
(a) Replaces: <b>N/A</b>	
(Course #)	(Department/Program)
(b) Cannot take: <b>N/A</b> for further credit.	
(Course #)	(Department/Program)

TOTAL HOURS PER TERM: <b>72</b>	TRAINING DAY-BASED INSTRUCTION
<b>STRUCTURE OF HOURS:</b>	LENGTH OF COURSE: _____
Lectures: <b>39</b> Hrs	HOURS PER DAY: _____
Seminar: _____ Hrs	
Laboratory: <b>33</b> Hrs	
Field Experience: _____ Hrs	
Student Directed Learning: _____ Hrs	
Other (Specify): _____ Hrs	

MAXIMUM ENROLLMENT:	<b>24</b>
EXPECTED FREQUENCY OF COURSE OFFERINGS:	<b>Every two years</b>
<b>WILL TRANSFER CREDIT BE REQUESTED? (lower-level courses only)</b>	<input type="checkbox"/> Yes <input type="checkbox"/> No
<b>WILL TRANSFER CREDIT BE REQUESTED? (upper-level requested by department)</b>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<b>TRANSFER CREDIT EXISTS IN BCCAT TRANSFER GUIDE:</b>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

**AUTHORIZATION SIGNATURES:**

Course Designer(s): _____	Chairperson: _____
Nigel Dance	Art Last ( <i>Curriculum Committee</i> )
Department Head: _____	Dean: _____
Art Last	Wanda Gordon
PAC Approval in Principle Date: _____	PAC Final Approval Date: Mar. 30, 2007

**LEARNING OBJECTIVES / GOALS / OUTCOMES / LEARNING OUTCOMES:**

Upon successful completion of this course, students will be able to:

1. Relate theories of bonding and structure to the properties of organometallic compounds.
2. Perform laboratory work safely and with care and precision.
3. Interpret laboratory results in terms of theoretical material covered in the course, and to understand the relationship between experimental and theoretical science.

**METHODS:**

Presentation of the course will be by inter-related theory classes and laboratory sessions. Audio-visual aids will be used where appropriate and students will be given instruction in the use of instrumental techniques and in the use of an academic library.

**PRIOR LEARNING ASSESSMENT RECOGNITION (PLAR):**

Credit can be awarded for this course through PLAR (Please check :)  Yes  No

**METHODS OF OBTAINING PLAR:**

Examination

**TEXTBOOKS, REFERENCES, MATERIALS:**

[Textbook selection varies by instructor. An example of texts for this course might be:]  
"Organometallic Chemistry," G.O. Spessard and G.L. Miessler, current edition,  
UCFV Laboratory Manual for Chemistry 421

**SUPPLIES / MATERIALS:**

All necessary laboratory supplies will be provided.

**STUDENT EVALUATION:**

[An example of student evaluation for this course might be:]

In-term tests	35%	Final examination	35%
Laboratory (reports and technique)	25%	Problem sets	5%

**COURSE CONTENT:**

[Course content varies by instructor. An example of course content might be:]

- Theories of bonding; molecular orbital description of bonding in organometallics; the 18-electron rule; hard and soft ligands.
- The use of spectroscopic techniques in characterizing organometallic compounds; timescales of various physical techniques and fluxionality.
- Bonding of common ligands, such as carbon monoxide, hydride, phosphine, alkene, and carbene, in organo-transition metal compounds.
- Boron-cluster and metal-cluster compounds; methods of electron counting.
- The isolobal concept and its applications.
- Arene-transition metal complexes.
- The role of organo-transition metal complexes in organic synthesis.

Laboratory Experiments

8 or 9 laboratory experiments could be chosen, which would be illustrative of such concepts as inert atmosphere preparation techniques, structure determination, interpretation of infrared, UV-visible and NMR spectra, and kinetics as applied to organo-transition metal compounds.