UNIVERSITY COLLEGE of the FRASER VALLEY

COURSE IMPLEMENTATION DATE:	Jan 1995
COURSE REVISED IMPLEMENTATION DATE:	Sept 2005
COURSE TO BE REVIEWED:	Sept 2009
(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: **Chemistry**

CHEM 421		**4**
COURSE NAME/NUMBER	FORMER COURSE NUMBER	UCFV CREDITS

Advanced Inorganic Chemistry
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 or equivalent**
COREQUISITES:

SYNONYMOUS COURSE(S)
(a) Replaces: _____ *(Course #)*
(b) Cannot take: _____ *(Course #)* for further credit.

SERVICE COURSE TO:
_____ *(Department/Program)*
_____ *(Department/Program)*

TOTAL HOURS PER TERM: **81**
STRUCTURE OF HOURS:

Lectures:	**45**	Hrs
Seminar:		Hrs
Laboratory:	**36**	Hrs
Field Experience:		Hrs
Student Directed Learning:		Hrs
Other (Specify):		Hrs

TRAINING DAY-BASED INSTRUCTION
LENGTH OF COURSE: _____
HOURS PER DAY: _____

MAXIMUM ENROLLMENT:	**24**	
EXPECTED FREQUENCY OF COURSE OFFERINGS:	**Yearly**	
WILL TRANSFER CREDIT BE REQUESTED? (lower-level courses only)	☐ Yes	☐ No
WILL TRANSFER CREDIT BE REQUESTED? (upper-level requested by department)	☐ Yes	☒ No
TRANSFER CREDIT EXISTS IN BCCAT TRANSFER GUIDE:	☐ Yes	☒ No

AUTHORIZATION SIGNATURES:

Course Designer(s): Nigel Dance
Chairperson: Giillian Mimmack *(Curriculum Committee)*
Department Head: Art Last
Dean: Jackie Snodgrass
PAC Approval in Principle Date:
PAC Final Approval Date: October 1, 2004

LEARNING OBJECTIVES / GOALS / OUTCOMES / LEARNING OUTCOMES:

This course is designed to enable students 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:

Challenge exam.

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.