

UNIVERSITY COLLEGE OF THE FRASER VALLEY

COURSE INFORMATION

DISCIPLINE/DEPARTMENT: Chemistry **IMPLEMENTATION DATE:** Jan. 1995

Revised: _____

<u>Chemistry 421</u>	<u>Advanced Inorganic Chemistry</u>	<u>4</u>
SUBJECT/NUMBER OF COURSE	DESCRIPTIVE TITLE	UCFV
CREDITS		

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.

RATIONALE:

COURSE PREREQUISITES: Chemistry 321

COURSE COREQUISITES: None

HOURS PER TERM FOR EACH STUDENT	Lecture	60	hrs	Student Directed	
	Laboratory	40	hrs	Learning	hrs
	Seminar		hrs	Other - specify:	
	Field Experience		hrs	Extra lab time will be used for exams & seminars	
				TOTAL	24
				112	HRS

MAXIMUM ENROLMENT: 24

Is transfer credit requested? **9** Yes **:** No

AUTHORIZATION SIGNATURES:

Course Designer(s): N. Dance **Chairperson:** T. Cooper

Curriculum Committee

Department Head: A. Last **Dean:** W. Welsh

PAC: Final Approval: Jan 1999
(Date)

NAME & NUMBER OF COURSE

COURSE CONTENT

1. Theories of Bonding. Molecular orbital description of bonding; the 18-electron rule; hard and soft ligands.
2. The use of spectroscopic techniques in characterizing organometallic compounds. Time scales of various physical techniques.
3. A description of bonding of common ligands (carbon monoxide, hydride, phosphine, olefine, carbene, etc.) in organo-transition metal compounds.
4. Metal cluster compounds.
5. The isolobal concept; the 16/18-electron rule and its exceptions.
6. Arene-transition metal complexes.
7. Oxidative-addition (reductive-elimination) reactions.
8. The role of organo-transition metal complexes in organic synthesis.

LABORATORY EXPERIMENTS:

- | | |
|---------------|---|
| Experiment 1. | Preparation of Zeise's Salt, $K[PtCl_3(C_2H_4)].H_2O$ |
| Experiment 2. | Preparation and Characterization of $RhCl(PPh_3)_3$ |
| Experiment 3. | Preparation of $[CH_3C_5H_4Mn(CO)_2NO][PF_6]$ |
| Experiment 4. | Preparation of mesitylenetricarbonylmobybdenum (0) |
| Experiment 5. | Preparation of a Metal cluster Complex |
| Experiment 6. | Use of organometallis complexes in Organic Synthesis (I) |
| Experiment 7. | Use of organometallis complexes in Organic Synthesis (II) |