

UNIVERSITY COLLEGE OF THE FRASER VALLEY

COURSE INFORMATION

DISCIPLINE/DEPARTMENT: Chemistry **IMPLEMENTATION DATE:** June 1994

Revised: _____

Chemistry 221	Inorganic Chemistry	4
SUBJECT/NUMBER OF COURSE CREDITS	DESCRIPTIVE TITLE	UCFV

CALENDAR DESCRIPTION: This course concentrates on the chemistry of non-transition elements and their compounds, with emphasis on symmetry, bonding, periodic properties and the descriptive chemistry of selected groups. The experiments performed in the laboratory component of the course will be directly related to the topics discussed during lectures. (CHEM 221, 222, and 231 are intended for students who wish to take majors or minors in chemistry, or take a combined honours program involving chemistry and another science subject).

RATIONALE:

COURSE PREREQUISITES: CHEM 112, or CHEM 101 and 102 (Grade B or better)

COURSE COREQUISITES: None

HOURS PER TERM FOR EACH STUDENT	Lecture	42	hrs	Student Directed Learning	hrs
	Laboratory	32	hrs	Other - specify:	
	Seminar	15	hrs	<u>Tutorials & lab</u>	24 hrs
	Field Experience		hrs	TOTAL	98 HRS

MAXIMUM ENROLMENT: 24

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

AUTHORIZATION SIGNATURES:

Course Designer(s): Dr. N.S. Dance Chairperson: T. Cooper
Curriculum Committee

Department Head: E. Kroeker Dean: K. Wayne Welsh

PAC: Approval in Principle _____ PAC: Final Approval: November 27, 1996
(Date) (Date)

Chemistry 221

NAME & NUMBER OF COURSE

COURSE CONTENT:

1. Theories of Atomic Structure. Introduction to wave mechanics.
2. Theories of Bonding. Application of VSEPR theory, molecular orbital theory, valence bond theory to inorganic systems.
3. The Solid State. Metals, ionic solids, covalent solids, silicates and semi-conductors. Radius Ratio rules and calculation of Lattice Energy of an Ionic Compound.
4. Chemical Properties of Main-Group Elements and their Compounds, in Relation to the Periodic Table.
5. Thermodynamic and Kinetic Effects in Main-Group Chemistry.
6. Descriptive Main-Group Chemistry.
Selected topics will concentrate on the chemistry of:
 - (a) hydrogen
 - (b) Group 14
 - (c) Group 16
 - (d) Electron-deficient compounds.
 - (e) Recent advances in inorganic chemistry.

LABORATORY EXPERIMENTS 8 or 9 labs will be chosen from the following:

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|---------------|--|
| Experiment 1. | Preparation and Thermal Decomposition of an Electron-deficient Compound, $[\text{C}_6\text{H}_5)_3\text{P}]_2\text{CuBH}_4$. |
| Experiment 2. | Preparation of Tin(IV) Iodide and Two Derivatives, $[\text{Et}_4\text{N}]_2[\text{SnI}_4\text{Cl}_2]$ and $\text{SnI}_4(\text{PPh}_3)_2$. |
| Experiment 3. | Preparation and NMR of Tris(2,4-pentanedionato) silicon hydrogendichloride. |
| Experiment 4. | Preparation and Spectroscopy of Ph_4Sn and derivatives. |
| Experiment 5. | Infra-Red Spectroscopy of Deutero-Substituted Compounds. |
| Experiment 6. | Preparation of $(\text{EtOPh})_2\text{Te}$ and $(\text{EtOPh})_2\text{TeCl}_2$. |
| Experiment 7. | Spectroscopy (Ir, NMR, and Mass spec) of $(\text{EtOPh})_2\text{Te}$ and $(\text{EtOPh})_2\text{TeCl}_2$. |
| Experiment 8. | Preparation of Silicone Polymers. |
| Experiment 9. | Relative Stability of Tin(IV) and Lead(IV). Preparation of Ammonium Hexachlorostannate(IV) and Ammonium Hexachloroplumbate(IV). |