UNIVERSITY COLLEGE of the FRASER VALLEY

COURSE IMPLEMENTATION DATE: June 1994
COURSE REVISED IMPLEMENTATION DATE: May 2006
COURSE TO BE REVIEWED: December 2009
(Four years after implementation date) (MONTH YEAR)

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 221		**4**
COURSE NAME/NUMBER	FORMER COURSE NUMBER	UCFV CREDITS

Inorganic Chemistry
COURSE DESCRIPTIVE TITLE

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.

PREREQUISITES: CHEM 113 and CHEM 114
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: **84**
STRUCTURE OF HOURS:

Lectures:	**45**	Hrs
Seminar:		Hrs
Laboratory:	**39**	Hrs
Field Experience:		Hrs
Student Directed Learning:		Hrs
Other (Specify): Tutorial and Lab		Hrs

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

MAXIMUM ENROLLMENT: **24**
EXPECTED FREQUENCY OF COURSE OFFERINGS:

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): N. Dance
Chairperson: *(Curriculum Committee)*
Department Head: A. Last
Dean: J. Snodgrass
PAC Approval in Principle Date:
PAC Final Approval Date: December 7, 2005

LEARNING OBJECTIVES / GOALS / OUTCOMES / LEARNING OUTCOMES:

The course is designed to enable students to:

1. Relate theories of bonding and structure to the properties of inorganic materials.

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 interrelated theory classes ("lectures"), discussion periods ("seminars"), and laboratory sessions. Audio visual aids will be used where appropriate, and students will be given instruction in the use of various 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 exams, including both theory and lab components

TEXTBOOKS, REFERENCES, MATERIALS:

[Textbook selection varies by instructor. An example of texts for this course might be:]

Inorganic Chemistry, 2nd Ed., Shriver, Atkins and Langford. Publisher: W.H. Freeman, ISBN 0-7167-2079-5

UCFV Laboratory Manual for Chemistry 221.

SUPPLIES / MATERIALS:

Laboratory supplies required.

STUDENT EVALUATION:

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

First in-term test	20%
Second in-term test	20%
Laboratory (reports and technique)	25%
Final examination	35%

COURSE CONTENT:

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

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:

Experiment 1. Preparation and Thermal Decomposition of an Electron-deficient Compound, [C6H5)3P]2CuBH4.

Experiment 2. Preparation of Tin(IV) Iodide and Two Derivatives, [Et4N]2[SnI4Cl2] and SnI4(PPh3)2.

Experiment 3. Preparation and NMR of Tris(2,4-pentanedionato) silicon hydrogendichloride.

Experiment 4. Preparation and Spectroscopy of Ph4Sn and derivatives.

Experiment 5. Infra-Red Spectroscopy of Deutero-Substituted Compounds.

Experiment 6. Preparation of (EtOPh)2Te and (EtOPh)2TeCl2.

Experiment 7. Spectroscopy (Ir, NMR, and Mass spec) of (EtOPh)2Te and (EtOPh)2TeCl2.

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).