

COURSE SYLLABUS

1. Course Code: **CHEM 120**
2. Course Title: **Inorganic Chemistry**
3. Course Description: Theoretical aspects of inorganic chemistry; a systematic study of the properties of the elements from the point of view of modern atomic structure.
4. Pre-requisite: CHEM 111
5. Credit: 3 units, 3 hrs class

6. Student Outcomes

- a) demonstrate a broad and coherent knowledge and understanding in the core areas of chemistry, inorganic, organic, physical, biological and analytical chemistry; and in addition the necessary background in mathematics and physics
- b) gather data using standard laboratory equipment, modern instrumentation and classical techniques
- c) identify and solve problems involving chemistry, using current disciplinary and interdisciplinary principles
- d) qualify for further study and/or for entry-level professional employment in the general workplace (To vary for university, colleges and professional schools)
- e) work effectively and independently in multidisciplinary and multicultural teams
- f) act in recognition of professional, social, and ethical responsibility
- g) effectively communicate orally and writing using both English and Filipino
- h) articulate and discuss the latest developments in the specific field of practice
- i) interpret relevant scientific data and make judgments that include reflection on relevant scientific and ethical issues
- j) preserve and promote "Filipino historical and cultural heritage"

7. Course Outcomes

At the end of this course, the students should be able to:

- a) explain principles of basic inorganic chemistry that were encountered in earlier courses such as atomic structure and bonding, thermodynamics, and kinetics.
- b) relate structure and reactivity in inorganic systems.
- c) apply concepts of symmetry and group theory in understanding molecular behavior and structure.
- d) describe the chemistry of representative elements and transition elements and their compounds
- e) gain enhanced independence in scholarship through active learning exercises

- f) report new discoveries in chemistry.

8. Course Outline

- A. Atomic Structure and Atomic Properties
 - a. Origin & Distribution of Elements
 - b. Electronic Structure
 - c. Periodic Trends
- B. Ionic Bonding and Ionic Solids
 - a. Characteristic Structures
 - b. Rationalization of Structures
 - c. Lattice Enthalpies
 - d. Crystal Defects and Defect Structures

----- First Long Examination -----

- C. Molecular Structure and Symmetry
 - a. Valence Bond Theory
 - b. Molecular Orbital Theory
 - c. Molecular Symmetry
- D. Metallic Bonding
 - a. Band Theory
 - b. Superconductivity
- E. Acids and Bases
 - a. Lewis Acids & Bases
 - b. Hard/Soft Acids & Bases
- F. Chemistry of the Main Group Elements

----- Second Long Examination -----

- G. Chemistry of the d-Block Elements
 - a. Structures
 - b. Nomenclature
 - c. Bonding
 - d. Magnetic Properties
 - e. Electronic Spectra
 - f. Reactions

----- Third Long Examination -----

9. Course Evaluation

GRADING SYSTEM

<i>Lecture exams, quizzes, project</i>	75%
3 Long examinations (20% each)	60%
Quizzes, Assignments, Seatworks	10%
Project (Reporting)	5%

Final Examination 25%

- Exemption: 60% or better on ALL long examinations, AND an average of 65 or better.

10. Recommended References

- a) Brown, T.E., LeMay, H.E.H., Bursten, B.E., Murphy, C.J., Woodward, P. & Stolsfuz, M.E. (2009). *Chemistry: The central science*. New Jersey: Pearson Prentice Hall.

- b) Meissler, G. L. and Tarr, D. A. 1999, Inorganic Chemistry, 2nd Ed. New Jersey: Prentice-Hall, Inc.
- c) Cotton, F. A. and Wilkinson, G. 1988, Advanced Inorganic Chemistry, 5th Ed. USA: John Wiley and Sons.
- d) Housecroft, C. E. and Sharpe, A. G. 2005, Inorganic Chemistry, 2nd Ed. London: Pearson Educational Limited.
- e) Shriver, D. F. and Atkins, P. W. 1999, Inorganic Chemistry, 3rd Ed. UK: Oxford University Press.
- f) Huheey, J. E., Keiter, E. A and Keiter, R. L. 1993, Inorganic Chemistry: Principles of Structure and Reactivity, 4th Ed. New York: HarperCollins College Publishers.
- g) Selected original work journals, review articles and patents.

11. Other Course Policies

- University rules on attendance will be followed:
 - Absences beyond 20% of prescribed number of meetings are considered excessive.
 - An absence may be considered excused if an official excuse slip issued by the college secretary is presented.
- A general make-up exam may be given to those who missed the exam due to valid reasons in which an official excuse slip must have been presented. Quizzes, seatworks, reporting, and assignments missed when the absence is excused will be marked as 0 pts / 0 total pts.