

Module Code:	Chem - 101
Module title:	Chemistry-I (Inorganic Chemistry)
Name of Scheme:	BS Chemistry (4 Years)
Semester :	1 st
Module Type:	Foundation
Module Rating:	3 Credits

1. Introduction of the Course:

The course is organized to provide an adequate knowledge about periodicity, chemical bonding and general concepts of acids and bases.

2. Course Objectives

The course is designed:

1. To introduce students about the key introductory concepts of atomic structure and chemical bonding.
2. To introduce theories of acids and bases.

3. Course Contents

1. Periodicity

Diagonal and vertical relationships of first row elements; Electro negativity of elements (Pauling and Mullikan scales); Polarizability and polarizing power of ions; Periodicity in the properties of outer transition and inner transition elements.

2. Chemical Bonding

Types of chemical Bonding, theories of chemical bonding, and prediction of molecular shapes using valence shell electron pair repulsion (VSEPER) Model, Molecular orbital theory applied to diatomic molecules, bonding in electron deficient compounds.

3. Acid-Base Concept:

General concept of acids and bases, detail of Lewis concept of acids and bases, Soft and Hard acid-base (SHAB) concept and its application, relative strength of acids and bases based on PKa value, Leveling effect, reaction of acids and bases, relationship between redox reactions and acid base reaction, Indicators and theory of indicators.

4. Chemistry of d- Block Element:

Electronic configuration and oxidation states of transition elements, Nomenclature & theories of coordination compounds, Valence Bond Theory (VBT), Molecular Orbital Theory (MOT), and Crystal Field Theory (CFT) for octahedral complexes, Chelates, Applications of Coordination compounds.

4. Teaching-learning Strategies

1. Lectures
2. Group Discussion

BS (Chemistry) 4Year Program

3. Laboratory work
4. Seminar/ Workshop

5. **Learning Outcome:**

1. Students are expected to get acquire the basic knowledge of determining molecular shapes.
2. They will be able to understand the concepts of acids and bases and use them efficiently.

6. **Assessment Strategies:**

1. Lecture Based Examination (Objective and Subjective)
2. Assignments
3. Class discussion
4. Quiz
5. Tests

7. **Recommended Readings:**

1. Cotton, F, Albert, Geoffrey Wilkinson and Paul L. Gaus, "Basic Inorganic Chemistry", John, Wiley & Sons Inc, 3rd Edition (1995).
2. Jefferey, G.H., j. bassett, J.Mendham and R.C. Denney, "Vogel's text book of Quantitative Chemical analysis", 5th Edition, Benjamin Cummings, (1989).
3. Jolly, William, L., "Modern Inorganic Chemistry", McGraw Hill, 2nd Edition (1991).
4. Lee, J.D., "Modern Inorganic Chemistry", Champan & Hall, 5th Edition (1996).
5. Rayner Canham, Geiof., "Descriptive Inorganic Chemistry" & Co. (1995).
6. Sharp, A.G. "Inorganic Chemistry", Longman, 3rd Edition (1992).
7. Shriver, D.F., P.W. Atkins and C.H. Langford, "Inorganic Chemistry", Oxford, 2nd Edition (1996).

Module Code:	Chem - 102
Module title:	Chemistry - I (Inorganic Chemistry Lab)
Name of Scheme:	BS Chemistry (4 Years)
Semester :	1 st
Module Type:	Foundation
Module Rating:	1 Credits

1. **Introduction of the Course:**

The course is organized to provide an adequate knowledge about periodicity, chemical bonding and general concepts of acids and bases.

2. **Course Objectives:**

The course is designed:

1. To introduce students about the key introductory concepts of atomic structure and chemical bonding.
2. To introduce theories of acids and bases.

3. **Course Contents:**

- Basic Introduction to preparation of different types of Solutions.

ARGENTOMETRY

MOHR,S Method

- Determine the % purity of NaCl.
- Determine the amount of Cl^{-1} in given sample solution.

REDOX TITRATIONS

- Determine the amount/ dm^3 of $\text{FeSO}_4 \cdot 7\text{H}_2\text{O}$ hydrate using potassium dichromate.
- Determine of % of Iron in ferric Alum using $\text{K}_2\text{Cr}_2\text{O}_7$.
- Determination of no. of water molecules in $\text{FeSO}_4 \cdot x\text{H}_2\text{O}$ using $\text{K}_2\text{Cr}_2\text{O}_7$.

ACID BASE TITRATIONS

- Determine the strength of given acid/base solution.

SALT ANALYSIS

- Separation and identification of two acid and two basic radicals from a mixture of two salts.

4. **Teaching-learning Strategies**

1. Lectures
2. Group Discussion

BS (Chemistry) 4Year Program

3. Laboratory work
4. Seminar/ Workshop

5. Learning Outcome:

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2. They will be able to understand the concepts of acids and bases and use them efficiently.

6. Assessment Strategies:

1. Lecture Based Examination (Objective and Subjective)
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