



# SILVER OAK UNIVERSITY

Silver Oak Institute of Science

Bachelor of Science Physics

Course Name: General Chemical Sciences

Course Code: 2050263136

Semester: 1<sup>st</sup>

## Prerequisite:

1. Basic knowledge of Chemical science.

## Course Objectives:

1. To make students understand the basics of organic chemistry, structure of atoms, chemistry of gases and liquids.
2. To impart practical knowledge for qualitative analysis of different organic compounds.

## Teaching Scheme:

Teaching Scheme				
L	T	P	Contact Hours	Credit
2	0	4	6	4

## Contents:

Unit	Topics	Teaching Hours	% Weightage
1	<b>Atomic Structure</b> Review of Rutherford's atomic model, Bohr's theory, and Hydrogen atomic spectra. Derivation of radius and energy of an electron in hydrogen atom, limitations of Bohr's theory, dual behavior of matter and radiation, de Broglie's equations, Heisenberg Uncertainty principle and their related problems. <b>Fundamentals of Organic Chemistry</b> IUPAC Nomenclature of poly functional organic compounds, comparative study of bond lengths, bond angles, bond energies and dihedral angles, bond polarity, dipole moment and illustration with examples of organic compounds	15	50
2	<b>Gases &amp; Liquids</b> Gaseous state: Review of kinetic theory of gases, van der Waals equation of state Boyle temperature. Molecular velocity: Maxwell's Boltzmann distribution law of molecular velocities (most probable, average and root mean square velocities). Liquid State: Molecular forces and general properties of liquids. Surface tension: surface tension, surface energy, effect by capillary rise method of temperature on surface tension, shapes of liquid drops and soap bubbles, capillary action, determination of surface tension by capillary rise method.	15	50

## Course Outcomes:

Sr. No.	CO Statement	Unit
CO-1	Understanding the basic concepts of organic chemistry and atomic structure.	1
CO-2	Understanding the theory of gaseous & liquid state and science behind it.	2

CO-3	Analyzing the given mixture of organic compound by preliminary tests.	1
CO-4	Comprehensive knowledge about confirming the presence of functional group present in given mixture of organic compound.	2

**Teaching & Learning Methodology:**

1. Problem based Learning
2. Cooperative based Learning
3. Competency based Learning
4. Experiment centric teaching methods
5. Case studies
6. Interactive Lectures

**List of Experiments:**

**Total Hours: 56**

Sr.No	Practical Name
1	Preparations of standard solutions.
2	Qualitative analysis for identification of given organic compound.
3	Qualitative analysis for identification of given organic compound their Color, aliphatic/aromatic compounds, saturation and unsaturation, etc.
4	Qualitative analysis for identification and detection of elements like Nitrogen, Sulphur and Halogen by Lassaigne's test in organic compound.
5	Qualitative analysis for identification and detection of Functional group tests like Phenols, Amides/ Urea, Carbohydrates, Amines, Carboxylic acids, Aldehydes, Ketones, Alcohols, and Esters
6	Identification of the unknown compound from the literature using melting point/ boiling point Acid-Base titration to find out the acid/base concentration
7	Acid-Base titration to find out the acid/base concentration
8	Acid Base titration for HCL vs. NaOH.
9	Acid Base titration for CH <sub>3</sub> COOH vs. NaOH.
10	Acid Base titration for CH <sub>3</sub> COOH vs. NH <sub>4</sub> OH.
11	Acid Base titration for HCL vs. NH <sub>4</sub> OH.
12	Acid Base titration for CH <sub>3</sub> COOH vs. KOH.

**Books Recommended: -**

1. P.W. Atkins: "Physical Chemistry", 2002.
2. Bahl, A. & Bahl, B.S. "Advanced Organic Chemistry", S. Chand, 2010.
3. P. Y. Bruice, "Organic Chemistry", Pearson Education Pvt. Ltd., New Delhi (2013).
4. Lee, J.D. Concise, "Inorganic Chemistry" ELBS, 1991.
5. Cotton, F.A., Wilkinson, G. & Gaus, P.L. "Basic Inorganic Chemistry", Wiley.
6. Douglas, B.E., Mc Daniel, D.H. & Alexander, J. J. "Concepts and Models in Inorganic Chemistry", John Wiley & Sons.

**List of Open-Source Software/learning website:**

1. <http://silveroakuni.ac.in/video-lecture>

**CO-PO-PSO Matrix:**

<b>CO. No.</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>	<b>PSO1</b>	<b>PSO2</b>
<b>CO-1</b>	3	2	3	2	2	3	3	2	-	-	2	3	3
<b>CO-2</b>	3	2	3	2	2	3	3	2	-	-	2	3	3
<b>CO-3</b>	3	2	2	2	2	2	3	2	-	-	2	3	3
<b>CO-4</b>	3	3	2	2	2	3	3	3	-	-	3	3	3