	The Maharaja Sayajirao University of Baroda Faculty/College of Polytechnic, Department of Chemistry <<Address>>, <<Contact details>>, <<e-mail ID>>	ACADEMIC YEAR 2021-2022

First Semester of F.Y. D. Architecture : Diploma

YEAR	I	**ACH 3106: Applied Chemistry**	MARKS	50
Semester	I		HOURS	28

Objectives:	• To develop scientific enquiry, ability to establish the cause and effect relationship and logical development of different disciplines. • To develop the ability to predict the results under given conditions of chemical activities.
Employability/ Entrepreneurship/Skill Development Aspects	• Develop ability of analyzing information. • Develop learning through observation and logical resoning. • Appreciate contribution of Chemistry towards improvement of life. • Quantify amount of solute in a solution through experiments conducted in laboratory.
Course Outcome	• Problem solving abilities. • Equip students to face challenges related to health, nutrition, environment in industries and agriculture as well. • Inculcate values of preservation of environment.

COURSE CONTENT / SYLLABUS

UNIT-I	**Atomic Structure and Chemical Bonding** Bohr's theory, Fundamental particles, Atomic number, isotopes, Aufbau's principle, electron arrangement in orbital, chemical bonding: types of chemical bonds-electrovalent bond, covalent bond, metallic bond, metallic properties, structure of solids : metallic solids, unit cell-bcc, fcc and hcp, packing of metals.	3 hrs.
UNIT-II	**Concepts of Electrochemistry** Arrhenius theory of ionization, modern concept of acids and bases, ionic product of water, pH scale, buffer solution, indicators, solubility product, common ion effect, electrolysis, Faraday's law of electrolysis, industrial applications of electrolysis.	3 hrs.
UNIT-III	**Basic Organic Chemistry** Hybridization –sp, sp2, sp3 hybridizations with example of each, sigma and pi-bonding, Classification of Organic compound, Functional group classification, Explanation of following terms- saturated and unsaturated hydrocarbon, isomerism, hydrocarbons : sources, Distillation of coal-tar, refining of petroleum, Preparation, properties and uses of alkane, alkene and alkynes.	4hrs.
UNIT-IV	**Polymers and Adhesives**	4hrs.

	Introduction and definition of polymers and monomer, classification of polymer, types of polymerization reaction. Synthesis, properties and applications of polyethylene, polypropylene, polyvinyl chloride, Teflon, polystyrene , phenol formaldehyde, polyacrylonitrile. , Natural rubber and properties, vulcanization of rubber, adhesives and their classification and uses.	
UNIT – V	**Water and its Treatment** Impurities in water, soft and hard water, types of hardness, effect of impurities, formation of scale priming and foaming, treatment of boiler feed water, portable water, degree of hardness, estimation of hardness.	3 Hrs
UNIT-VI	**Metallurgy** General principles of chemical metallurgy-Ore dressing, Calcination, Roasting, Extraction of metals from concentrated ore, Metallurgy of Copper, Aluminum, and Iron.	3 Hrs
UNIT VII	**Alloys :** Objectives of alloying, Properties of alloys, Classification of alloys, composition and applications of nickel steel, Chrome steel, Chrome-nickel steel, bronze, brass, bell metal, gun metal, Monel metal german silver solders, pewter type metal, Duralumin, bearing metal, manufacturing and application of steel.	4 hrs
UNIT VIII	**Corrosion of Metals and its Prevention:** Corrosion, Mechanism of corrosion, Direct chemical process, Electrochemical Process, Galvanic cell, and concentration cell action, pitting corrosion, Corrosion of iron and aluminium, protection from corrosion.	4hrs
Laboratory Excercises: Experiment on Volumetric analysis. Students must perform minimum 10 experiments.		

REFERENCES

1.	Polytechnic Chemistry by V.P.Mehta, Jain Brothers, 12th Edition, 2017
2.	A Text book of Engineering Chemistry by M.M.Uppal, Khanna Publishers
3.	Inorganic Chemistry by P.L.Soni, Sultan Chand and Sons
4	Organic Chemistry by P.L. Soni, Sultan Chand and Sons, 2007 29th Edition
5	A Text Book of Applied Chemistry by J. Rajaram, Tata McGraw Hill Co. , New Delhi (Not Available)
6	Engineering Chemistry by S.S. Dara, S Chand and Publication (Not Available)
7	Engineering Chemistry by JAIN & JAIN, Dhanpat Rai Publishing Company Pvt. Limited, New Delhi.1998