

FOUR YEAR UNDERGRADUATE PROGRAM(2024 – 28)

DEPARTMENT OF CHEMISTRY

COURSE CURRICULUM

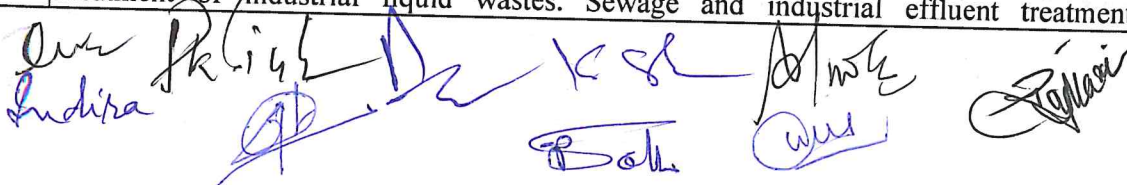
PART-A: Introduction

Program: Bachelor in Science (Certificate / Diploma / Degree/Honors)		Semester-I/III/V	Session: 2024-2025
1	Course Code	CHVAC	
2	Course Title	Chemistry in Daily Life	
3	Course Type	Value Added Course(VAC)	
4	Pre-requisite(if,any)	As per Program	
5	Course Learning Outcomes(CLO)	<ul style="list-style-type: none"> ➤ To introduce the student about dairy product,beverages,food additives, artificial sweeteners, flavors, food colorants, paints, pigments, dyes etc. ➤ To make aware the students about air pollution, hydrological cycle, composition of soil, fertilizers etc. ➤ To introduce the students about carbohydrate, vitamins,drugs. ➤ To introduce students about concept of thermodynamics used in day to day life. 	
6	Credit Value	2 Credits	Credit = 15 Hours -learning & Observation
7	Total Marks	Max.Marks:50	Min Passing Marks:20

PART -B: Content of the Course

TotalNo.of Teaching–learning Periods(01 Hr. per period) - 30 Periods (30 Hours)

Unit	Topics(Course contents)	No. of Period
I	<p>Dairy Products: Composition of milk and milk products. Analysis of fat content, minerals in milk and butter. Estimation of added water in milk.</p> <p>Beverages: Analysis of caffeine in coffee and tea, detection of chicory in coffee, chloral hydrate in toddy, estimation of methyl alcohol in alcoholic beverages.</p> <p>Food additives, adulterants and contaminants: Food preservatives like benzoates, propionates, sorbates, disulphites.</p> <p>Artificial sweeteners: spartame, saccharin, dulcin, sucralose and sodium cyclamate.</p> <p>Flavors: Vanillin, alkyl esters (fruit flavours) and monosodium glutamate. Artificial food colorants: Coal tar dyes and non-permitted colours and metallic salts. Analysis of pesticide residues in food.</p> <p>Paints & Pigments: White pigments (white lead, ZnO, lithopone, TiO₂). Blue, red, yellow and green pigments. Paints and distempers: Requirement of a good paint. Emulsion, latex; luminescent paints. Fire retardant paints and enamels, lacquers. Solvents and thinners for paints.</p> <p>Dyes: Colour and constitution (electronic concept). Classification of dyes. Methods of applying dyes to the fabrics. A general study of azo dyes, Mordant brown, Congo red and methyl orange.</p>	08
II	<p>Air Pollution: Air pollutants, prevention and control, Greenhouse gases and acid rain. Ozone hole and CFC's. Photochemical smog and PAN. Catalytic converters for mobile sources. Bhopal gas tragedy.</p> <p>Hydrologic cycle, sources, criteria and standards of water quality - safe drinking water. Public health significance and measurement of water quality parameters - (Colour, turbidity, total solids, acidity, alkalinity, hardness, sulphate, fluoride, phosphate, nitrite, nitrate, BOD and COD).</p> <p>Water purification for drinking and industrial purposes. Toxic chemicals in the environment. Detergents - pollution aspects, eutrophication. Pesticides and insecticides - pollution aspects. Heavy metal pollution. Solid pollutants - treatment and disposal. Treatment of industrial liquid wastes. Sewage and industrial effluent treatment.</p>	07



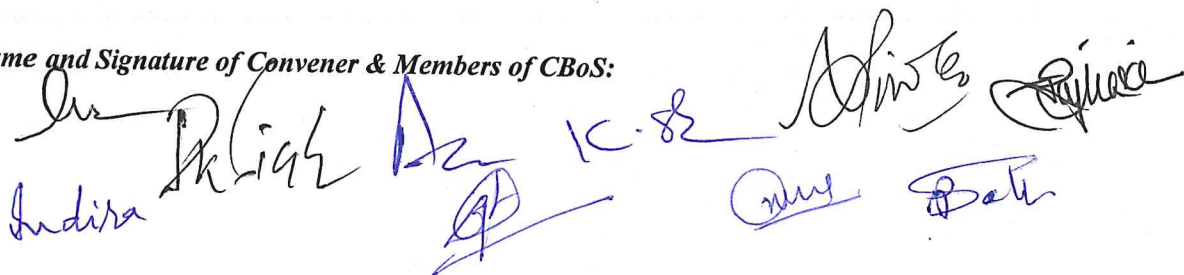
	<p>Composition of soil – inorganic and organic components in soil - micro and macronutrients.</p> <p>Fertilizers: Classification of fertilizers - Straight Fertilizers, Compound/Complex Fertilizers, Fertilizer Mixtures. Manufacture and general properties of fertilizer products - Urea and DAP.</p>	
III	<p>Carbohydrates: Structure, function and Chemistry of some important mono and disaccharides.</p> <p>Vitamins: Classification and Nomenclature. Sources, deficiency diseases and structures of Vitamin A₁, Vitamin B₁, Vitamin C, Vitamin D, Vitamin E & Vitamin K₁.</p> <p>Drugs: Classification and nomenclature.</p> <p>Structure and function of: <i>Analgesics</i> – aspirin, paracetamol.</p> <p><i>Anthelmintic drug:</i> mebendazole.</p> <p><i>Antiallergic drug:</i> Chloropheneramine maleate.</p> <p><i>Antibiotics:</i> Penicillin V, Chloromycetin, Streptomycin.</p> <p><i>Anti-inflammatory agent:</i> Oxypheno-butazone.</p> <p><i>Antimalarials:</i> Primazquine phosphate & Chloroquine.</p> <p>Oils and fats: Composition of edible oils, detection of purity, rancidity of fats and oil. Tests for adulterants like aregemone oil and mineral oils.</p> <p>Soaps & Detergents: Structures and methods of use of soaps and detergents.</p>	08
IV	<p>Chemical Thermodynamics: Concept of fugacity and free energy, Activity and activity coefficient, spontaneity of processes-entropy and free energy changes. Partial molar quantities, colligative properties, Le-Chatelier principle, phase equilibrium. Enzyme catalyzed reactions.</p> <p>Principles of Reactivity: Basis kinetic concepts, rates of simple and complex chemical reactions, empirical rate equations. Temperature dependence of rates and activation parameters. Branched chain reactions – explosion limits. Oscillatory reactions.</p> <p>Chemical energy system and limitations, principles and applications of primary & secondary batteries and fuel cell. Basics of solar energy, future energy storer. aerospace materials. Problems of plastic waste management. Strategies for the development of environment friendly polymers.</p>	08
Keywords	<p><i>Air pollution, carbohydrate, vitamins, LeChatteliar's law, Dairy product, artificial sweeteners. fertilizers, Paint, pigment, dyes.</i></p>	

Indira, P. Singh, A. K. Singh, K. S. Singh, Anshu Singh, Singh, Singh, Singh

Signature of Convener & Members (CBoS):

PART-C: Learning Resources		
Text Books, Reference Books and Others		
Text Books Recommended: <ol style="list-style-type: none"> 1. Sharma, B. K. (1998). <i>Introduction to Industrial Chemistry</i>. Meerut: Goel Publishing. 2. Many, N. S., & Swamy, S. (1998). <i>Foods: Facts and Principles</i> (4th ed.). New Age International. 3. Kar, A. (2022). <i>Medicinal Chemistry</i>. NEW AGE International Pvt Ltd Reference books Recommended: <ol style="list-style-type: none"> 1. <i>Drugs and Pharmaceutical Sciences Series</i>. (Year). Marcel Dekker, Vol. II. New York: INC. 2. Atkins, P., & de Paula, J. (2002). <i>Physical Chemistry</i> (7th ed.). Oxford University Press. 3. Swaminathan, & Goswamy. (2001). <i>Handbook on Fertilizer Technology</i> (6th ed.). FAI. 4. Finar, I. L. (Year). <i>Organic Chemistry</i> (Vol. 1&2). 5. Fried, J. R. (Year). <i>Polymer Science and Technology</i>. Prentice Hall. 		
Online Resources: https://onlinecourses.swayam2.ac.in/nos22_sc23/preview https://www.researchgate.net/publication/343585969_Chemistry_in_Everyday_Life https://www.youtube.com/watch?v=P3p1C87gc0U https://www.slideshare.net/sanjaijosephManesh/food-chemistry-51688453		
PART-D: Assessment and Evaluation		
Suggested Continuous Evaluation Methods: Maximum Marks: 50 Marks Continuous Internal Assessment(CIA):15 Marks End Semester Exam(ESE):35Marks		
Continuous Internal Assessment (CIA): (By Course Teacher)	Internal Test / Quiz-(2): 10 & 10 Assignment/Seminar + Attendance- 05 Total Marks -15	Better marks out of the two Test / Quiz + obtained marks in Assignment shall be considered against 15 Marks
End Semester Exam (ESE):	Two section – A & B Section A: Q1. Objective – 05 x 1 = 05 Mark; Q2. Short answer type- 5 x 2 = 10 Marks Section B: Descriptive answer type qts., 1 out of 2 from each unit- 4 x 5 = 20 Marks	

Name and Signature of Convener & Members of CBoS:



 Indira