# FOUR YEAR UNDERGRADUATE PROGRAM(2024 – 28)
## DEPARTMENT OFCHEMISTRY
## 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)** | ➢ ***To introduce the student about dairy product,beverages,food additives, artificial sweeteners, flavors, food colorants, paints, pigments, dyes etc.***<br>➢ ***To make aware the students about air pollution, hydrological cycle, composition of soil, fertilizers etc.***<br>➢ ***To introduce the students about carbohydrate, vitamins,drugs.***<br>➢ ***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 | **Dairy Products:** Composition of milk and milk products. Analysis of fat content, minerals in milk and butter. Estimation of added water in milk.<br>**Beverages:** Analysis of caffeine in coffee and tea, detection of chicory in coffee, chloral hydrate in toddy, estimation of methyl alcohol in alcoholic beverages.<br>**Food additives, adulterants and contaminants:** Food preservatives like benzoates, propionates, sorbates, disulphites.<br>**Artificial sweeteners:** spartame, saccharin, dulcin, sucralose and sodium cyclamate.<br>**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.<br>**Paints & Pigments:** White pigments (white lead, ZnO, lithopone, $TiO_2$). 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.<br>**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. | 08 |
| II | **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.<br>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).<br>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. | 07 |

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|---|---|---|
| | Composition of soil – inorganic and organic components in soil - micro and macronutrients.<br>**Fertilizers:** Classification of fertilizers - Straight Fertilizers, Compound/Complex Fertilizers, Fertilizer Mixtures. Manufacture and general properties of fertilizer products - Urea and DAP. | |
| **III** | **Carbohydrates**: Structure, function and Chemistry of some important mono and disaccharides.<br>**Vitamins:** Classification and Nomenclature.Sources, deficiency diseases and structures of Vitamin $A_1$, Vitamin $B_1$,VitaminC, Vitamin D, Vitamin E &Vitamin $K_1$.<br>**Drugs:** Classification and nomenclature.<br>Structure and function of: *Analgesics* –aspirin, paracetamol.<br>*Anthelmentic drug*:mebendazole.<br>*Antiallergic drug:* Chloropheneramine maleate.<br>*Antibiotics:*PenicillinV,Chloromycetin,Streptomycin.<br>*Anti-infalmmatory agent:* Oxypheno-butazone.<br>*Antimalarials:* Primazuine phosphate & Chloroquine.<br>**Oils and fats:** Composition of edible oils, detection of purity, rancidity of fats and oil. Tests for adulterants like aregemone oil and mineral oils.<br>**Soaps & Detergents:** Structures and methods of use of soaps and detergents. | **08** |
| **IV** | **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.<br>**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.<br>**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. | **08** |
| ***Keywords*** | ***Air pollution, carbohydrate,vitamins, LeChatteliar's law, Dairy product, artificial sweeteners. fertilizers,Paint,pigment ,dyes.*** | |

*SignatureofConvener&Members (CBoS):*

## PART–C:Learning Resources

**Text Books, Reference Books and Others**

***Text Books Recommended:***

1. *Sharma, B. K. (1998). Introduction to Industrial Chemistry. Meerut: Goel Publishing.*
2. *Many, N. S., & Swamy, S. (1998). Foods: Facts and Principles (4th ed.). New Age International.*
3. *Kar, A. (2022). Medicinal Chemistry. NEW AGE International Pvt Ltd*

***Reference books Recommended:***

1. *Drugs and Pharmaceutical Sciences Series. (Year). Marcel Dekker, Vol. II. New York: INC.*
2. *Atkins, P., & de Paula, J. (2002). Physical Chemistry (7th ed.). Oxford University Press.*
3. *Swaminathan, & Goswamy. (2001). Handbook on Fertilizer Technology (6th ed.). FAI.*
4. *Finar, I. L. (Year). Organic Chemistry (Vol. 1&2).*
5. *Fired, J. R. (Year). Polymer Science and Technology. 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 InternalAssessment (CIA):** **(By Course Teacher)** | Internal Test / Quiz-(2): **10 &10**<br>Assignment/Seminar +Attendance- **05**<br>Total Marks -**15** | Better marks out of thetwo Test / Quiz+obtained marks in Assignment shall be considered against **15** Marks |
| **End Semester Exam (ESE):** | **Two section – A & B**<br>Section **A**: **Q1**. Objective – **05 x1= 05** Mark; **Q2**. Short answer type- **5x2 =10Marks**<br>Section **B**: Descriptive answer type qts.,**1out of 2** from each unit-**4x05=20Marks** | |

***Name and Signature of Convener & Members of CBoS:***