

VANITA VISHRAM WOMEN'S UNIVERSITY
SCHOOL OF SCIENCE AND TECHNOLOGY
DEPARTMENT OF CHEMISTRY



VANITA VISHRAM
WOMEN'S UNIVERSITY
— SURAT —

BACHELOR OF PROGRAMME
under Learning Outcomes-based Curriculum Framework (LOCF)
for Under Graduate (UG) Education

SEMESTER 1
Generic Elective Courses (GE)

Syllabus applicable to the students seeking admission in the following programmes
B.A. /B.Com./B.B.A./B.Sc./B.C.A. under LOCF
w.e.f. the Academic Year 2022-23

1. Preamble – VVWU

Vanita Vishram Women's University (VVWU) is the First-ever Women's University of Gujarat approved by the Government of Gujarat under the provisions of the Gujarat Private Universities Act, 2009. It is a University committed to achieve Women's Empowerment through Quality Education, Skill Development, and by providing employment opportunities to its girl students through its model curriculum, integration of technology in pedagogy and best-in-class infrastructure. The focus is on prioritizing practical component and experiential learning supported through academia-industry linkages, functional MoUs, skill development training, internships etc. It aims at providing opportunities to the girl students for holistic development and self-reliance.

VISION

Empowerment of women through quality education and skill development, so as to make them strong pillars of stability in the society.

MISSION

To provide Education & Professional Training to all women for their all-round development, so as to enable them to become economically independent and socially empowered citizens.

SEMESTER 1
GENERIC ELECTIVE COURSE PAPER 1
CH31090

Chemistry in Daily Life - I

Course Objectives

- Develop an appreciation for the importance of the role of chemistry in everyday life.
- Improve their ability to think critically and logically.
- Make students more aware of the chemicals found in all aspects of daily life.
- Become knowledgeable about the connection between chemistry and pollution, health care, energy, nutrition and life, and visual arts.
- Apply knowledge of chemistry to improve quality of life.

Course Outcomes

After completing the course, the students will be able to:

Basic concepts about chemistry and role of chemistry in daily life and connection between chemistry and nutrition and life.

COURSE CONTENTS

Unit- 1

(A) Scope and Importance of Chemistry in Life

Introduction, Chemical basis of life, Periodic table, Elements in the human body, Essential, Non-essential elements,

(B) Chemistry of Carbon

Bonding in Carbon – The Covalent Bond, Versatile Nature of Carbon, Allotropes of carbon, diamond, graphite, graphene, Saturated and Unsaturated Carbon Compounds, Chains, Branches and Rings, Homologous Series, Nomenclature of Carbon Compounds, Activated Carbon

Unit-2 Chemistry of Foods

(A) Food Additives:

Stabilizers, Gums, Thickeners and Gelling Agents as Food Additives

Sweeteners, classification of sweeteners, Fragrances, Flavouring agents and Enhancers, Parent compounds, chemical structure and plant source of such Flavouring agents, Food colour and Colour Retention Agents

(B) Food Adulteration:

Adulteration: Definition of Adulteration and Adulterant, Reasons of Adulteration, Types of Adulterants, Methods for detection of different adulterants in some common food items:

- (1) Milk
- (2) Milk products: Sweet curd, Rabdi, Khoa & its product, Chhana or Paneer, Ghee, Cottage cheese, condensed milk, Khoa, Ghee, Butter.
- (3) Spices: Whole spices, Black Pepper, Cloves, Mustard seed and Powdered spices.
- (4) Sweetening agents: Sugar, Pithi sugar, Honey, Jaggery, Burasugar.

Unit-3

(A) Chemistry of Water

Introduction, Chemical and physical properties of Water, Natural water, Turbidity, Colour, Taste, Odour, pH, TDS, Alkalinity, Chloride, water sterilization, Infectious Agents, Water Quality, Hardness, Water Softening, Ion exchange, Reverse Osmosis, Electrocoagulation, Electrodialysis, Waste Water

(B) Acid, Bases and Buffers

Acid and Base theories, Common acids and Base example in daily life, Properties of acid, properties of base, Reaction of Acid and Base, pH Scale, Water dissociation constants, Buffers, Acidic buffers, Basic buffers, pH of buffers

Unit-4

(A) Chemistry in Arts, communication and Transport

Art History and chemistry, Art Conservation, Art Historian, Paper, Gum Paste, Writing/Fountain Pen Ink, Chalk Crayons, Adhesives Chemistry and Communications, Chemistry and Transportation, Rubber Relationship between light and colour, Electromagnetic Spectrum, Cause of colour in objects, Properties of Light. The Nature and Behavior of Light, Mixing Colors: Light vs. Pigments, Colorants: Pigments and Dyes

(B) Chemistry in agriculture and plant protection

Composition of soil, components in soil-micro and macronutrients, Food for plants, nutrient deficiencies in plants. Fertilizers, composting, pesticides and their toxicities. Insecticides, fungicides.

Reference Books:

- B. K. Sharma: introduction to Industrial Chemistry, Goel Publishing, Meerut (1998)
- Medicinal Chemistry by Ashtoush Kar.
- Drugs and Pharmaceutical Sciences Series, Marcel Dekker, Vol. II, INC, New York
- Analysis of Foods – H.E. Cox: 13. Chemical Analysis of Foods – H.E.Cox and Pearson.
- Foods: Facts and Principles. N. Shakuntala Many and S. Swamy, 4th ed. New Age.

- International (1998) 6. Physical Chemistry – P I Atkins and J. de Paula – 7th Ed. 2002, Oxford University Press.
- Handbook on Fertilizer Technology by Swaminathan and Goswamy, 6th ed. 2001, FAI.
- Organic Chemistry by I. L. Finar, Vol. 1 & 2. 9. Polymer Science and Technology, J. R. Fried (Prentice Hall).

SEMESTER 1
GENERIC ELECTIVE COURSE PAPER 1
CH31100

Chemistry in Daily Life - I

Practicals

Course objective:

- To perform the pH meter instrument with various samples.
- To perform melting point and boiling point detection.
- To perform experiments based on household chemicals and food samples.
- To perform simple acid-base exercises.

Course Outcomes

After completing the course, the students will be able to: learn the basics expertise of sample purity, separation and isolation methods, melting points and boiling points.

COURSE CONTENTS

Any Eight Practicals

1. Application and working of common glassware and laboratory apparatus.
2. ChemSafLabs: Part -1: Safety symbols and MSDS Part -2: Prevention of accidents and first aid measures
3. Determination of pH of different everyday life chemical solution.
4. Isolation of casein from milk samples.
5. Determination of alkalinity in water.
6. Determination of melting point and boiling point.
7. Separation by distillation of homogeneous binary liquid mixtures.
8. Determination of strength of household acids.
9. Determination of percentage purity of acetic acid in food grade Vinegar.
10. Some quick test for detection of adulterants in food samples like milk, milk products, powdered spices and sweetening agents.

Reference Books:

- Vogel's qualitative organic analysis.
- Vogel's inorganic qualitative analysis.
- Organic Chemistry by Bahl & Bahl.
- "Text book of Organic Chemistry" by P. S. Kalsi, 1999, MacMillan of India Pvt. Ltd.
- Chemistry in daily life, by Kirpal Singh, 2012, PHI Learning Private Limited.

TEACHING METHODOLOGY

The teaching methodologies utilized for effective learning process in the course are:

1. Direct instruction/Lecture method
2. Problem solving Method
3. Small group teaching
4. The discussion Method
5. The study assignment method
6. ICT based teaching
7. Demonstration Method
8. Seminar based Learning
9. Project based Learn in