GUJARAT UNIVERSITY

B. Sc. SEMESTER IV

BOTANY

Skill Enhancement Course (BOTANY)

AS PER NEP - 2020

EFFECTIVE FROM JUNE 2023

Course Type	Course	Credits	Work Hours/ week	Exam hours	Marks		Total Mark
					Internal	External	
Skill Enhancement Course	SEC–BOT 246 WATER QUALITY ANALYSIS	2	1+2 = 3	2	25	25	50

Skill Enhancement Course (BOTANY)

SEC- BOT - 246

Water Quality Analysis

Learning objectives:

1. To know the importance of quality of water.
2. To study the general properties of water and understand water resources and water conservation.
3. To develop awareness about water quality criteria and standards, and their relation to public health and environment.
4. Know about the methods for the determination of water quality parameters.

Learning outcomes:

By the end of the course, the students will be able to:

1. Learn how to run accurate water quality tests and to determine how the parameters relate to each other.
2. Acquire skills in the analysis of water quality parameters and thus monitoring water quality.
3. Develop research ideas about in the field of analytical Botany.

SEC Paper Title: Water Quality Analysis (Credits: 2)

Unit 1: **Fundamentals of Water Analysis**

- Definition of water quality
- Importance of water for plants, agriculture, and ecosystems
- Water Pollution (sources of pollution and its effects on aquatic biodiversity and other ecosystems)
- Measures to check water pollution
- Physical Properties of Water – Temperature, Turbidity& Transparency, Total solids
- Chemical Parameters of Water – pH (definition, importance, and effect on plant growth), Dissolved Oxygen (DO) and Biological Oxygen Demand (BOD), Nutrients: Nitrogen, Phosphorus, Potassium (NPK) – their impact on water bodies and plant life, Hardness, and salinity
- Biological Aspects of Water Quality – Presence of microorganisms (bacteria, algae), Bioindicators and their role in water quality assessment, Eutrophication and its effects on aquatic ecosystems

Unit 2: Practical on Water Quality Testing and Analysis

1) Water Sample Collection Techniques

2) Determination of water temperature

3) Measuring turbidity (using a Sacchi disk or turbidity meter?)

4) Estimation of total dissolved solids (TDS) using a conductivity meter (Demonstration)

5) pH Determination: Using pH meter and pH paper

6) Dissolved Oxygen (DO): Winkler method or DO meter (Demonstration)

7) Microscopic examination of water samples to identify a few common algae and microorganisms

Recommended Readings:

1. Water Quality Assessments: A Guide to the Use of Biota, Sediments, and Water in Environmental Monitoring – Deborah Chapman

2. Standard Methods for the Examination of Water and Wastewater – American Public Health Association (APHA)

3. Water Quality: An Introduction – Claude E Boyd

4. Environmental Science – S C Santra

5. Environment Science by Kumresan, Saras Publication