

Shivaji University, Kolhapur
Department of Lifelong Learning and
Extension
Career Oriented Course
Certificate Course in Water and Soil
Analysis



Syllabus

2021-22

Shivaji University, Kolhapur
Department of Lifelong Learning and Extension
Career Oriented Course
Certificate Course in Water and Soil Analysis

*** PAPER-I ***

Unit-1 Earth's Natural Resources and Sources of Water

1. Hydrosphere
2. Introduction to Water cycle in Nature
3. Methods of Water sampling
4. Structure of Water molecule

Sources of Water

1. Rain, River, Ocean, Ground water
2. Origin of water
3. Forms of water- Solid, Liquid and Gas water

Unit-II Importance of water for sustaining life

1. Drinking and cooking
2. Clearing and washing
3. Water for construction
4. Water for Plants
5. Water for Industry
6. Water for Transport
7. Water for Power
- 8 -Water for Recreation
9. Water for heating homes
10. Water for fire-fighting
11. Water supply
12. Water Drainage
13. Water as a solvent.

Unit-III Types of water

1. Hard and soft water
2. Fresh and Dense water
3. Ground water
4. Potable water
5. Saline water

Unit-IV Sources of water Pollution

1. Introduction
2. What is water pollution
3. Sources - Sewage, Farm Chemicals and waste, Industrial waste

Unit-V Controlling water Pollution

1. Introduction
2. How to control water pollution
3. Sewage treatment
4. Protection of Drinking water

Unit-VI Earths Natural Resources and Soil Value

1. Introduction
- 2 Lithosphere
3. Introduction to Soil
4. The forest

Soil Value

1. Food value
2. Economic value
3. Environmental value
4. Recreation value
5. The minerals and the fuels

Unit-VII Soil Sampling and Profile

1. Method of Soil Sampling
2. Composition of soil - Rock particles, Minerals, Organic material, plant matter, animal matter, air and water
3. Formation of soil - Parent material, Climate, Land features, Plants and Animals Time
4. Layers of the soil
5. Features of the soil -Structures, Layers or horizons, Colour, Texture, Chemical condition
6. Types of soil - Sandy, clayey, Black peat, Loamy, chalky, Laterite

Unit-VIII Soil Pollution

1. Erosion-Weather, Temperature Wind, Storms, Human activity and Gravity
2. Industrial Effect - mining
3. Deforestation
4. Overgrazing
5. River Projects
6. Improper farming

Unit-IX Conservation of Soil

1. Land management
2. Contour ploughing
3. Terracing
4. strip cropping
5. Minimum tilling
6. Crop rotation
7. Manuring
8. Managing pastures
9. A forestations
10. Recycling wastes

PAPER-II

PRACTICALS

(Any 10)

Part-A

1. Field visit and sampling of water for Analysis
2. Determination of total Hardness of water
3. Determination of Alkanyity of water 4. Determination of water
- 4) Determination of PH of Water
5. Determination of Conductivity of water

Part-B

6. Field visit and sampling of soil for Analysis
- 7 Determination of water holding capacity of soil
8. Determination of Chloride content of soil
9. Determination of Moisture content of soil
10. Determination of PH of soil
11. Determination of Electrical conductivity of soil
12. Determination of Sulphate content of soil
13. Preparation of reagents and solutions
14. Flame photo meter

References

1. Environmental Chemistry by B.K. Sharma
2. Soil in India by P.C. Das
3. Textbook of Science
T.D. Biswas and S.K. Mukharji
Tat Mc Graw Hill Publication New Delhi
4. The Nature and Properties of Soil
N.C. Brady and R.R. Weil
5. Spectroscopy by Chatwal Anand
Himalaya Publishing House
6. The fundamental of analytical Chemistry
Skoog West and Holler
Harcourt College Publisher
7. Environmental Chemistry
A.K. De.
New Age International
8. Environmental Chemistry
G.W. Vanloom and S.J. Duffy
9. Text Book and Analytical and Industrial Chemistry for B.Sc. III Phadake
Prakashan, Nirlai Prakashan
10. Chemical and Biological methods of water pollution studies R.K. Trivedi and P.K. Goel
Environmental publication.
11. A Text book of quantitative Inorganic chemical Analysis A. I. Vogel.
12. Water and waste water Analysis. Ramakrishna and Mharghe (NEERI Publication)
13. Science and Technology Part VII-Dreamland Publication
14. Science and Technology Part VIII-Dreamland Publication
15. Water (Dreamland Publication)
