

Course Type	Course Code	Name of Course	L	T	P	Credit
DC	ESC 254	Soil and Environmental Microbiology Practical	0	0	2	2

Course Objective

- Impart the practical knowledge about soil properties.
- Develop idea about culture media and staining techniques.
- Develop understanding about the microbiology of air, water and soil environment

Learning Outcomes

Upon successful completion of this course, students will:

- Plan and conduct an experiment for physico-chemical properties of soil
- Understand the preparation of culture media and staining techniques.
- Learn methods for enumeration of microbes from air, water and soil.

Unit No.	Topics to be Covered	Practical Hours	Learning Outcome
1	Estimation of physical parameters of soil	2	To understand the physical parameters of soil
2	Estimation of chemical parameters(I)of soil	2	To understand the chemical parameters of soil
3	Estimation of chemical parameters(II)of soil	2	To understand the chemical parameters of soil
4	Estimation of heavy metals concentration from soil	2	To learn the process of heavy metal detection from the soil
5	Quantitative and qualitative characters of plant communitiesEcological sampling of an area (line transect and quadrat method) "species-area" curve method	2	To understand the Quantitative and qualitative characters of plant communities
6	Study of vegetation of pond ecosystem.	2	To understand the importance of microorganisms in the environment
7	Study of fresh water and polluted water algae – (Blue green algae, Green algae and Diatoms).	2	To understand the importance of microorganisms in the environment
8	Culture media preparation– Semi-synthetic and Synthetic media. Liquid, Solid and semisolid media, Nutrient agar, PDA media	2	To understand the culture media preparation
9	Gram staining techniques for detection of gram positive and gram negative bacteria. Study of fungi (medium – Rose Bengal agar).	2	To see the shape, size and arrangement for bacteria and fungi
10	Bacteriology of drinking water and domestic sewage -MPN techniques for total coliform, Faecal coliform and Faecal Streptococci (FS), Membrane filtration techniques for faecal coliform and total coliform. IMViC test	2	To understand the microorganisms in the water environment
11	Microbiology of Air: Enumeration of microbes by exposure plate method.	2	To understand the microorganisms in the air environment
12	Microbiology of soil: Isolation of microbes by serial dilution methods and colony count by colony counter.	2	To understand the microorganisms in the soil environment

Recommended manuals:

1. Handbook of instrumental techniques for analytical chemistry, Frank A. Settle, 1st Edition, Prentice Hall.
2. Microbiology: a laboratory manual. Cappuccino J C, Sherman N, 3rd edn. Benjamin/cummings Pub, New York.