

Rayat Shikshan Sanstha's

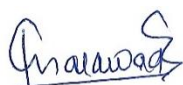
D. P. Bhosale College, Koregaon

Department of Microbiology (2023-2024)

Notice

Date: 28/12 /2024

All the student of B.Sc. III are the here by informed that Department of Microbiology going to organize your Skill based Course on **Theoretical Soil and Water Microbiology**". It has been scheduled from 1st January, 2024 to 31st January, 2024 Kindly, remain present at prescribed time in lecture hall.



HEAD
DEPARTMENT OF MICROBIOLOGY
D.P. BHOSALE COLLEGE, KOREGAON



Principal,
D. P. Bhosale College,
Koregaon.

Rayat Shikshan Sanstha's

D. P. Bhosale College, Koregaon

Department of Microbiology (2023-2024)

Skill based course (UG)

Theoretical Soil and Water Microbiology

Registration List

Sr. No.	Roll No.	Student Name
1.	20233231	Bansode Sanika Dhananjay
2.	20233232	Bhosale Amruta Suresh
3.	20233233	Disale Vaishnavi Bhupesh
4.	20233234	Ghadge Kiran Bapu
5.	20233235	Godase Aishwarya Deepak
6.	20233236	Godase Rutuja Dilip
7.	20233237	Kamble Vrushali Chandrakant
8.	20233238	Madane Nikhil Dilip
9.	20233239	Yadav Vaishnavi Kiran

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Department of Microbiology (2023-2024)

Skill Based Course (UG)

Theoretical Soil and Water Microbiology

Introduction

Soil Microbiology: It is the branch of science/ microbiology concerned with soil-inhabiting microorganisms, their functions, and activities. Soil is one of the world's most important natural resources. Together with air and water, it is the basis for life on planet earth. Soil can be defined as a thin layer of material covering the earth's surface and is formed from the interactions between five factors called soil forming factors includes topography of the land, the organisms present in the environment, the climate, the parent material, and the time.

An aquatic ecosystem is an ecosystem in a body of water. The two main types of aquatic ecosystems are marine ecosystems and freshwater ecosystems. Communities of organisms that are dependent on each other and on their environment live in aquatic ecosystems. Aquatic microbiology is the science that deals with microscopic living organisms in fresh or salt water systems. While aquatic microbiology can encompass all microorganisms , including bacteria, viruses, and fungi and their relation to other organisms in the aquatic environment . Bacteria, viruses, and fungi are widely distributed throughout aquatic environments. They can be found in fresh water rivers, lakes, and streams, in the surface waters and sediments of the world's oceans, and even in hot springs.. Microorganisms living in these diverse environments must deal with a wide range of physical conditions, and each has specific adaptations to live in the particular place it calls home. For example, some have adapted to live in fresh waters with very low salinity , while others live in the saltiest parts of the ocean. Some must deal with the harsh cold of arctic waters, while those in hot springs are subjected to intense heat. In addition, aquatic microorganisms can be found living in environments where there are extremes in other physical parameters such as pressure, sunlight, organic substances, dissolved gases, and water clarity. Aquatic microorganisms obtain nutrition in a variety of ways. For example, some bacteria living near the surface of either fresh or marine waters, where there is often abundant sunlight, are able to produce their own food through the process of

photosynthesis . Bacteria living at hydrothermal vents on the ocean floor where there is no sunlight can produce their own food through a process known as chemosynthesis , which depends on preformed organic carbon as an energy source. Many other microorganisms are not able to produce their own food. Rather, they obtain 2 necessary nutrition from the breakdown of organic matter such as dead organisms. Importance of aquatic microorganisms Aquatic microorganisms play a vital role in the cycling of nutrients within their environment, and thus are a crucial part of the food chain . Many microorganisms obtain their nutrition by breaking down organic matter in dead plants and animals. As a result of this process of decay, nutrients are released in a form usable by plants. These aquatic microorganisms are especially important in the cycling of the nutrients nitrogen , phosphorus , and carbon. Without this recycling , plants would have few organic nutrients to use for growth. In addition to breaking down organic matter and recycling it into a form of nutrients that plants can use, many of the microorganisms become food themselves. There are many types of animals that graze on bacteria and fungi. For example, some deposit-feeding marine worms ingest sediments and digest numerous bacteria and fungi found there. Therefore, these microorganisms are intimate members of the food web in at least two ways. Humans have taken advantage of the role these microorganisms play in nutrient cycles. At sewage treatment plants, bacteria are cultured and then used to break down human wastes. However, in addition to the beneficial uses of some aquatic microorganisms, others may cause problems for people because they are pathogens, which can cause serious diseases. For example, bacteria such as Salmonella typhi, S. paratyphi, and the Norwalk virus are found in water contaminated by sewage can cause illness. Fecal coliform (E. coli) bacteria and Enterococcus bacteria are two types of microorganisms that are used to indicate the presence of disease causing microorganisms in aquatic environments.

Syllabus of Course

Soil Microbiology– Introduction

Soil Microbiology

Types of soil

Soil water amount affected by many factors

Soil Microflora

Element cycles

Carbon Cycle

Nitrogen cycle

Sulfur cycle

Phosphorus Cycle

Aquatic microbiology

Microbial Water

Types of indicators

Water Treatment

Biological Wastewater Treatment

Reference Books:-

- Advanced Aseptic Processing Technology
- Sterile Drug Products: Formulation, Packaging, Manufacturing ...
- Microbial Contamination Control in Parenteral Manufacturing
- Contamination Control and Cleanrooms

Board of studies-

Miss.A.S Kavthalkar



Mr. M. M. Jadhav



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Skill Based Course (UG)

Theoretical Soil and Water Microbiology

Timetable of the course

Class	Time	Thursday 04/01/2024
B.Sc III	11:20 am -12.08 pm	ASK
	12.08 pm -12.56 pm	MMJ
	3.00 pm - 4.00 pm	ASK

Class	Time	Friday 05/01/2024	Saturday 06/01/2024
B.Sc III	11:20 am -12.08 pm	MMJ	ASK
	12.08 pm -12.56 pm	ASK	MMJ
	3.00 pm - 4.00 pm	MMJ	ASK

Class	Time	Thursday 11/01/2024	Friday 12/01/2024
B.Sc III	11:20 am -12.08 pm	MMJ	ASK
	12.08 pm -12.56 pm	ASK	MMJ
	3.00 pm - 4.00 pm	MMJ	ASK

Class	Time	Saturday 13/01/2024	Thursday 18/01/2024
B.Sc III	11:20 am -12.08 pm	MMJ	ASK
	12.08 pm -12.56 pm	ASK	MMJ
	3.00 pm - 4.00 pm	MMJ	ASK

Class	Time	Friday 19/01/2024	Saturday 20/01/2024
B.Sc III	11:20 am -12.08 pm	MMJ	ASK
	12.08 pm -12.56 pm	ASK	MMJ
	3.00 pm - 4.00 pm	MMJ	ASK

Class	Time	Thursday 25/01/2024	Saturday 27/01/2024
B.Sc III	11:20 am -12.08 pm	MMJ	ASK
	12.08 pm -12.56 pm	ASK	MMJ
	3.00 pm - 4.00 pm	MMJ	ASK

Class	Time	Tuesday 30/01/2024	Wednesday 31/01/2024
B.Sc III	11:20 am -12.08 pm	MMJ	EXAM
	12.08 pm -12.56 pm	ASK	
	3.00 pm - 4.00 pm	MMJ	

Name of faculty:

Miss.A.S Kavthalkar (ASK)

Mr. M. M. Jadhav (MMJ)



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DEPARTMENT OF MICROBIOLOGY
D.P. BHOSALE COLLEGE, KOREGAON

Skill based course (UG)

Question Paper (Theoretical Soil and Water Microbiology)

Day & Date: Wednesday 31/01/2024

Marks – 20

Time – 11:00 am to 12:00 pm

Q. 1 Multiple Choice Questions

1. The water content of a soil sample cannot be determined by _____ method.
 - a) oven drying
 - b) alcohol
 - c) calcium carbide
 - d) pipette
2. In oven drying method, the soil sample is kept for about _____ hours in the oven.
 - a) 1
 - b) 2
 - c) 24
 - d) 48
3. An organic soil sample is kept in oven for its water content determination. The temperature preferred is _____.
 - a) 60°
 - b) 80°
 - c) 105°
 - d) 110°
4. _____ method is specially suited to a circumstance where water content is to be quickly determined for the purpose of proper field control.
 - a) Oven drying
 - b) Sand bath
 - c) Alcohol
 - d) Calcium carbide
5. In pycnometer method of water content determination, it is necessary to accurately know the specific gravity G of soil whose water content is to be

determined.

- a) True
- b) False

Que. 2 Answer in brief (any 2)

- 1) Discuss the mechanism of treatment of industrial wastes.
- 2) What are the ways of water management?
- 3) Explain Different types of soil Found in india

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Department of Microbiology (2023-2024)

Skill Based Course (UG)

Theoretical Soil and Water Microbiology

Result

Sr.No	Name of Student	Result	Grade
1	Bansode Sanika Dhananjay	PASS	A
2	Bhosale Amruta Suresh	PASS	A
3	Disale Vaishnavi Bhupesh	PASS	B
4	Ghadge Kiran Bapu	PASS	A
5	Godase Aishwarya Deepak	PASS	A
6	Godase Rutuja Dilip	PASS	B
7	Kamble Vrushali Chandrakant	PASS	A
8	Madane Nikhil Dilip	PASS	A
9	Yadav Vaishnavi Kiran	PASS	A

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D.P. BHOSALE COLLEGE, KOREGAON**

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D. P. Bhosale College, Koregaon

Department of Microbiology (2023-2024)

Skill Based Course (UG)

Theoretical Soil and Water Microbiology

Report

The students obtain the skills essential for controlling the procedure setting & learn the best repetition techniques for decisive media fill sizes also understand the "critical factors" required to maintain compliance. Soil microbiology is the study of microscopic organisms in soil and how they promote soil fertility, degrade pollutants, and fight diseases. These soil microorganisms are integral to the global ecosystem and play critical roles in decomposition and nutrient cycling, which are vital for plant growth and soil health.

Water is essential to life, but many people do not have access to clean and safe drinking water and many die of waterborne bacterial infections. In this review a general characterization of the most important bacterial diseases transmitted through water—cholera, typhoid fever and bacillary dysentery—is presented, focusing on the biology and ecology of the causal agents and on the diseases' characteristics and their life cycles in the environment. The importance of pathogenic *Escherichia coli* strains and emerging pathogens in drinking water-transmitted diseases is also briefly discussed. Microbiological water analysis is mainly based on the concept of fecal indicator bacteria. The main bacteria present in human and animal feces (focusing on their behavior in their hosts and in the environment) and the most important fecal indicator bacteria are presented and discussed (focusing on the advantages and limitations of their use as markers). Important sources of bacterial fecal pollution of environmental waters are also briefly indicated. In the last topic it is discussed which indicators of fecal pollution should be used in current drinking water microbiological analysis.

The 09 students have been participated in the said course with proper knowledge about Theoretical Soil and Water Microbiology. After completion of the course certificates are offered individually.



Anand

HEAD
DEPARTMENT OF MICROBIOLOGY
D.P. BHOSALE COLLEGE, KOREGAON

Sr. No.	Name of the Student	01/01/2024	02/01/24	03/01/24	04/01/24	05/01/24	06/01/24	05/01/24	09/01/24	10/01/24	11/01/24	12/01/24	13/01/24	15/01/24	16/01/24	17/01/24	18/01/24	19/01/24	20/01/24	22/01/24	23/01/24	25/01/24	27/01/24	28/01/24	29/01/24	30/01/24	31/01/24	
1.	Godase Rutuja Dilip																											
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4.	Bhosale Amruta Suresh																											
5.	Madane Nikhili Dilip																											
6.	Kamble Vrushali Chandrakant			V.C. Kamble																								
7.	Yadav Vaishnavi Kiran			V.K. Yadav																								
8.	Disale Vaishnavi Bhupesh																											

(Signature)



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D. P. BHOSALE COLLEGE, KOREGAON



SKILL BASED COURSE

Certificate

This is to certify that, MR./Miss.....class..... Subject: Microbiology

Successfully completed One month Skill Based Course on **Theoretical Soil and Water Microbiology**

Organized by Department of Microbiology, D. P. Bhosale College, Koregaon. District- Satara (M.S.)

held in 1 st January, 2024 to 31st January, 2024.

Chairman

Course Co-ordinator

Principal,
D. P. Bhosale College,
Koregaon.