

Programme Outline: SYBSc (SEMESTER III)

Course Code	Unit No.	Name of the Unit	Credits
SVSC303		ENRICHMENT, CULTIVATION AND DETECTION OF MICROORGANISMS	2
	1	Practical	

SEMESTER 3

NAME OF THE COURSE	ENRICHMENT, CULTIVATION AND DETECTION OF MICROORGANISMS
CLASS	SYBSc
COURSE CODE	SVSC303
NUMBER OF CREDITS	2
NUMBER OF LECTURES PER WEEK	4
TOTAL NUMBER OF LECTURES PER SEMESTER	60
EVALUATION METHOD	CONTINUOUS ASSESSMENT
TOTAL MARKS	50
PASSING MARKS	20

COURSE OBJECTIVES

CO 1.	To study yeasts and fungi, cultivate yeast in Sabouraud's broth under static and shaker conditions, study the macroscopic and microscopic features of fungi using wet mount and slide culture technique, and understand the ecological relationship of fungi and algae in lichens.
CO 2.	To learn the enrichment, isolation and detection of thermophilic bacteria, halophilic bacteria, pectinase producing bacteria and fungi, and free-living nitrogen fixing bacteria.
CO 3.	To learn to cultivate anaerobes using Gaspak chamber
CO 4.	To produce invertase enzyme from commercial baker's yeast and calculate enzyme activity on the basis of enzyme assay
CO 5	To write assignments on Archaeobacteria and extremophiles.

COURSE LEARNING OUTCOMES:

CLO 1.	The learner will be able to cultivate yeast in Sabouraud's broth and distinguish the growth pattern under static and shaker conditions, identify the fungi by its macroscopic and microscopic features, and study the microscopic features of lichens to identify the two microbial groups in the same.
CLO 2.	The learner will be able to set up experiments for enrichment, isolation and detection of various groups of microorganisms from natural samples.
CLO 3.	The learner will be able to carry out the cultivation of anaerobes
CLO 4.	The learner will be able to produce the invertase enzyme from commercial baker's yeast, and compute its enzyme activity
CLO 5	The learner will be able to review the literature and write and submit assignments on Archaeobacteria and extremophiles to recognize the importance of these evolutionary significant microbial groups.

UNIT 1	PRACTICAL (60 LECTURES)
1.1	Revision of basic techniques in microbiology
1.2	Cultivation of yeast in Sabouraud's broth - Static and shaker culture
1.3	Wet mount of fungi
1.4	Slide culture technique
1.5	Study of lichens
1.6	Enrichment, isolation and study of thermophiles
1.7	Enrichment, isolation and study of moderate and extreme halophiles from seawater
1.8	Assignments on a. Extreme habitats & Extremophiles and b. Archaeobacteria
1.9	Cultivation of anaerobes using Gaspak chamber.
1.10	Enrichment, isolation and study of free-living nitrogen-fixing bacteria- Azotobacter
1.11	Enrichment, isolation and study of pectinase producing bacteria and fungi.
1.12	Production of invertase enzyme from commercial baker's yeast and its detection

REFERENCES:

1. Cappuccino, J. G., & Sherman, N. (2020). *Microbiology: A laboratory manual* (12th ed). Pearson.
2. Madigan, Michael T., Bender, Kelly S., Buckley, Daniel H., Sattley, W. Matthew., & Stahl, David A. (2018). *Brock Biology of Microorganisms* (15th ed). Pearson.
3. Pelczar Jr, M. J.; Chan, E.C.S. & Krieg, N. R. (1986). *Microbiology* (5th ed). Tata McGraw-Hill Education.
4. Willey, J.M., Sherwood, L.M., & Woolverton, C.J. (2008). *Prescott, Harley and Klein's Microbiology* (7th ed). McGraw Hill International Edition.

ASSESSMENT DETAILS:

Continuous Assessment (50 marks)

1. A minimum of two activities will be given in each semester.
2. Each will be for 20 marks.
3. The nature of the activities will be decided by the Examiner
4. 10 marks will be given for Class participation.