Faculty of Science and Humanities
B.Sc. (Microbiology) (Semester - 6)
In Effect from Academic Year 2023-24

Branch Name:	B.Sc. Microbiology
Program Code:	SC102
Course Name:	Microbiology Practical
Course Code:	2SC1020605
Pre-requisite Course:	Basic laboratory techniques

Course Objective:

1. To learn the basic and fundamental aspects of screening bacteria for industrial application.
2. To study the antibiogram of bacteria.
3. To study and understand immobilization of enzyme.
4. To understand the oxygen transfer rate and the typical fermentation processes.

Teaching and Examination Scheme:

Teaching Scheme (Hours per week)				Evaluation Scheme (Marks)				
				Theory (Marks)		Practical (Marks)		
Lecture (L)	Tutorial (T)	Practical (P)	Credit	University Assessment	Continuous Assessment	University Assessment	Continuous Assessment	Total (Marks)
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List of Experiments:

1. Study of skin micro flora.
2. Isolation, cultivation, identification and study of antibiotic sensitivity (Antibiogram) of Gram negative Bacteria .
3. Urine examination: Physical, chemical, microscopic.
4. Identification of unknown medically important bacteria from mixed population using identification keys:
   a. *Escherichia coli,*
   b. Enterobacteraerogenes,
   c. Proteus vulgaris,
   d. Salmonella group : S. typhi, S. paratyphi A, S. paratyphi B,
   e. Shigelladysenteriae,
   f. Pseudomonas aeruginosa.
5. Isolation and enumeration of bacteriophage.
6. Primary screening of (a) Amylase producer, (b) Organic acid producers , (c) Protease producer (d) Antibiotic producers, i) crowded plate method, ii) Wilkin's method.
7. Bioassay of Penicillin using *Bacillus subtilis.*
8. Determination of Oxygen Transfer Rate (OTR) under static, sparing and shaking condition by sodium sulphite method.
9. Sterility testing of Pharmaceutical products.
10. Immobilization of cells/enzyme.
11. Fermentative production of Amylase and determination of Amylase activity.
12. Typical fermentation of alcohol.
13. Typical fermentation of gluconic acid.

Course Learning Outcomes (CLO): On completion of this course, the students will be able to:

CLO	Description	Bloom's Taxonomy Level
CLO1	To learn basics of screening of industrial important of bacteria.	1 Understand 2 Remember
CLO2	To identify and analyses the pathogen from diseased sample	1 Understand 2 Remember 3 Analyze 5 Evaluate
CLO3	To check sterility of the pharmaceutical product and perform bioassay of antibiotic.	2 Remember 3 Apply 4 Analyze 5 Evaluate
CLO4	To perform enzyme immobilization and check its acrivity	3 Apply 4 Analyze 5 Evaluate
CLO5	To perform Typical fermentation process of amylase, gluconic acid and alcohol.	3 Apply 4 Analyze 5 Evaluate
CLO6	To check and determine OTR which helps in designing fermenter and fermentative process.	3 Apply 4 Analyze 5 Evaluate 6 Create

Mapping of CLOs with POs & PSOs

Course LearningOutcomes	ProgramOutcomes(POs)									Program SpecificOutcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2	PSO3
CLO1	M		M					L			M	
CLO2	M		M					L			M	
CLO3	M	H	H	H	M		L	M		H	H	M
CLO4	H	H	H	H	H	H	M	M	L		H	H
CLO5	H	H	H	H	H	H	M	M			H	H
CLO6	H	H	H	H	H	H	H	H			H	H

H:High, M:Medium, L:Low