

FOUR YEAR UNDERGRADUATE PROGRAM (2024 – 28)
DEPARTMENT OF MICROBIOLOGY
COURSE CURRICULUM

PART – A: Introduction			
Program: Bachelor in Life Science (Certificate/Diploma/Degree/Honors)		Semester - II	
		Session: 2024-25	
1	Course Code	MBSC-02 T	
2	Course Title	Bacteriology, Virology and Protozoology	
3	Course Type	DSC	
4	Prerequisite (If Any)	As per program	
5	Course Learning Outcomes (CLO)	At the end of this course, the students will be able to – <ul style="list-style-type: none"> ➤ recall the ultrastructure of bacteria ➤ relate ecological distribution of microorganism and their significances for society ➤ illustrate the essential and current knowledge of bacteria ➤ identify virus, protozoa and archaebacteria with their special characteristics ➤ outline the beneficial & harmful behavior of viruses, bacteria, protozoan and other microbes 	
6	Credit Value	03 Credits	Credit = 15 Hours - Learning & Observation
7	Total Marks	Max. Marks: 100	Minimum Passing marks: 40
PART – B: Content of the Course			
Total No. of Teaching-Learning Periods (01 Hr. per period) - 45 Periods (45 Hours)			
UNIT	TOPIC (Course Contents)		No. of Period
I	Morphology and Ultra structure of Bacteria: Cell size, shape and arrangements. Composition, structure and function of cell membrane, cell wall of gram-positive, gram-negative bacteria, capsule, flagella, pili, ribosomes, inclusions, nucleoid, plasmids. Structure and stages of spore formation.		12
II	Gram negative, positive bacteria & Archaeobacteria: Gram negative and positive bacteria; characteristics and examples - Gram negative (non-proteobacteria– <i>Deinococcus</i> , <i>Spirochetes</i> . Alpha proteobacteria, <i>Rhizobium</i> , <i>Agrobacterium</i> . Gamma proteo-bacteria– <i>Escherichia</i> , <i>Pseudomonas</i>). Gram positive low G+C; <i>Bacillus</i> , <i>Clostridium</i> , <i>Staphylococcus</i> . High G+C: <i>Streptomyces</i> , <i>Frankia</i> . General characteristics, Ecological significance and economic importance of Archaea: Methanogens, thermophiles (Thermococcus, pyrococcus, thermoplasma) and halophiles (halobacteria and halococcus).		11
III	Morphology, ultrastructure, Classification & multiplication of viruses: General introduction, morphology and ultra- structure of viruses, capsid, envelopes. Types of Viral genome. Viral related forms -virions, viroids, virusoids, and prions. Classification of viruses. Salient features and life cycle of viruses: Bacteriophages (T4 & Lambda), Plant (TMV & CMV), Animal (Adenovirus & Pox virus).		11
IV	Introduction to protozoa; Occurrence and classification of protozoa. Structure, reproduction, life cycle and diseases caused by important protozoans - <i>Entamoeba</i> , <i>Giardia</i> , <i>Leishmania</i> , <i>Trypanosoma</i> and <i>Plasmodium</i>		11
Key Words		Bacteria, Archaea, Virus, Bacteriophage, Prions, Protozoan	

Name and Signature of Convener and Members of CBoS

Dr. Roshni Choudhary
10/6/24

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10/6/24

Part – C: Learning Resources

Text Books, Reference Books and Others

Text Books Recommended:

1. General Microbiology; Vol I & II, Powar C.B. and Dagainawala H. I., Himalay Pub. House, Bombay.
2. A Text Book of Microbiology; Dubey & Maheshwari.
3. A Text Book of Microbiology; R. P. Singh.
4. Fundamentals of Microbiology and Immunology, Ajit Kr. Banerjee and Nirmalya Banerji, Central publication.
5. Parasitology; H.S. Singh and P. Rastogi, First Edition, Rastogi Publications.

Reference Books:

6. Prescott's Microbiology. Wiley J M, Sherwood L M and Woolverton C J.
7. Microbiology. Pelczar M J, Chan E C S and Krieg N R.
8. General Microbiology. Stanier R Y, Ingraham J L, Wheelis M L, and Painter P R.
9. Microbiology: An Introduction. Tortora G J, Funke B R and Case C L.

Online Resources – e-Resources/ e-Books and e- learning portals

- <https://www.ncbi.nlm.nih.gov/books/NBK8477/>
- <https://www.britannica.com/science/archaea>
- <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7150055/>
- <https://nios.ac.in/media/documents/dmlt/Microbiology/Lesson-53.pdf>
- <http://ecoursesonline.iasri.res.in/Courses/Agricultural%20Microbiology/>

Part- D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:

Maximum Marks: 100 Marks

Continuous Internal Assessment (CIA): 30 Marks

End Semester Exam (ESE): 70 Marks


Continuous Internal Assessment (CIA): (By Course Teacher)	Internal Test / Quiz – (2): 20+20	Better marks out of the two Test/ Quiz + obtained marks in Assignment shall be considered against 30 Marks
	Assignment/ Seminar – 10	
	Total Marks – 30	

End Semester Exam (ESE):	Two Section – A & B
	Section A: Q1. Objective 10 X 1 = 10 Mark; Q2. Short answer type – 5X4= 20 Marks Section B: Descriptive answer type qts., 1 out of 2 from each unit – 4X10 = 40 Marks

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Dr. Nelson Koss

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PART – A: Introduction			
Program: Bachelor in Life Science (Certificate/Diploma/Degree/Honors)		Semester - II	
		Session: 2024-25	
1	Course Code	MBSC-02 P	
2	Course Title	Lab. Course – MBSC-02	
3	Course Type	Laboratory Course	
4	Prerequisite (If Any)	As per program	
5	Course Learning Outcomes (CLO)	At the end of this course, the students will be able to – <ul style="list-style-type: none"> ➤ culture microorganisms and get the knowledge about their morphological features ➤ illustrate different staining procedures ➤ identify bacteria and protozoa from different samples ➤ get practice of identification of colonies on different culture media 	
6	Credit Value	1 Credit	Credit = 30 Hours. Laboratory or Field learning/ Training
7	Total Marks	Max. Marks: 50	Min. Passing marks: 20

PART – B: Content of the Course

Total No. of learning-Training/ Performance Periods: 30 Periods (30 Hours)

Module	Topics (Course contents)	No. of Period
Lab./ Field Training/ Experiment contents of Course	1. Isolation and characterization of bacteria by colony characteristics. 2. Growth on simple media – Nutrient agar and Nutrient broth 3. Growth on complex media – Blood agar, Chocolate agar, Maconkey’s, and EMB agar. 4. Differential Staining Techniques: Gram staining and acid-fast staining 5. Special Staining Techniques: Negative staining and Endospore staining 6. Study of cytopathic effects of viruses using photographs. 7. Observation of protozoa from different samples.	30

Key Words Isolation, Identification, Staining Techniques, Cytopathic effects, Protozoa

PART – C: Learning Resources

Text Books, Reference Books and Others

Text Books Recommended:

1. Laboratory Manual of Microbiology and Biotechnology: Aneja K. R
2. Practical Microbiology: R. C. Dubey and D. K. Maheshwari.
3. Laboratory Manual in Microbiology: P. Gunasekaran.

Online Resources:

- <https://books.google.co.in/books?id=Wh9OTbjcsfUC&printsec=age&q&f=false>

PART – D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:

Maximum Marks: 50 Marks

Continuous Internal Assessment (CIA): 15 Marks

End Semester Exam (ESE): 35 Marks

Continuous Internal Assessment (CIA): (By Course Teacher)	Internal Test/ Quiz – (2): 10 & 10	Better Marks out of the two Test/ Quiz + obtained marks in Assignment shall be considered against 15 Marks
	Assignment/ Seminar + Attendance: 05	
	Total Marks – 15	
End Semester Exam (ESE):	Laboratory/ Field Skill Performance: On spot Assessment	
	A. Performed the Task based on lab. work – 20 Marks	Managed by course teacher as per lab. status
	B. Spotting based on tools & technology (written) – 10 Marks	
C. Viva-voce (based on principle/ technology) – 05 Marks		

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