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

PART – A: Introduction			
Program: Bachelor in Life Science (Honors/ Honors with Research)		**Semester - VIII**	**Session: 2024-25**
1	**Course Code**	**MBSE-10 T**	
2	**Course Title**	**Pharmaceutical Microbiology**	
3	**Course Type**	**Discipline Specific Elective (DSE)**	
4	**Prerequisite (If Any)**	**As per Program**	
5	**Course Learning Outcomes (CLO)**	**At the end of this course, the students will be able to –** ➢ relate Indian traditional therapies and contributors ➢ compare antimicrobial therapy and resistance ➢ develop basic awareness of pharmaceutical products, their testing and their spoilage ➢ identify drug designing and its applications ➢ illustrate agencies for clinical approval of pharmaceutical products	
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	Topics (Course contents)	No. of Period
I	**Historical account:** History and principles of Indian traditional medicine, Contributors to ancient traditional medicine, Importance of Charak in Indian traditional knowledge. **Antimicrobial chemotherapy**: General properties of antimicrobial agent. Mode of action of antibiotics, its uses & limitations: Penicillin, Tetracycline, Chloramphenicol, Sulpha drugs, mode of action of quinolinones. Bacterial resistance to antibiotics and resistant barrier.	12
II	**Testing of Pharmaceutical products:** Sterility test: Microbial Limit test, Pyrogen testing, In vitro Pyrogen Test (IPT), Endotoxin (LAL) Test, Preservative Efficacy test, Carcinogenic test, Antibiotic Assay. Structure of cell wall of gram positive and gram-negative bacteria, synthesis of peptidoglycan and mode of action of different antibiotics on cell wall.	11
III	**Microbial Pharmaceuticals:** Vaccine; Types of vaccine, toxoid, Edible vaccine, DNA vaccine, Protein subunit vaccine, synthetic peptide vaccine. Hormone- Insulin. Microbial spoilage of pharmaceutical products: Microbial contamination of pharmaceutical products and their preservation.	11
IV	**Application of Biosensors in pharmaceuticals**: Financing R & D capital and market outlook, IP, BP, USP, FDA perspective, rational drug designing and macro - molecular, cellular, synthetic drug carriers.	11
Key Words	**Traditional medicine, Antibiotics, Vaccine, Drug carrier, Biosensors**	

Name and Signature of Convener and Members of CBoS

10/6/24 10/6/24 10.6.24 10.6.24 10.6.24 DR.K.K.Patel Dr. Nelson Xess

Part – C: Learning Resources

Text Books, Reference Books and Others

Text Books Recommended:

1. Medical Microbiology; N. C. Dey and T. K. Dey, Allied agency, Calcutta.
2. Text book of Microbiology; R. Anantharayanan, C. K. Jayaram Panikar, Orient Longman, Mumbai.
3. Medical microbiology; P. Chrakrborthy
4. A Text Book of Microbiology: Dr. R. C. Dubey & Dr. D. K. Maheshwari

Reference Books:

1. Microbiology; Davis, Dulbecco, Eisen Harper and Row Maryland.
2. British Pharmacoppoeia (2001). The stationary office London

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

- **http://microbiology.free.fr/Presentations/antimicrobialchemotheray.pdf**
- **https://www.teachmint.com/tfile/studymaterial/class3rd/pharmaceuticalmicrobio/sterilitytestingpdf**
- **https://www.sciencedirect.com/science/article/pii/S2225411016000250**
- **https://en.wikipedia.org/wiki/Charaka**
- **https://www.sciencedirect.com/science/article/pii/S2225411016000250**

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** Assignment/ Seminar – **10** Total Marks – **30**	Better marks out of the two Test/ Quiz + obtained marks in Assignment shall be considered against **30** Marks
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**	

Name and Signature of Convener and Members of CBoS

10.6.24 10.6.24 10.6.24 Dr. K.K. Patil

10/6/24 Dr. Nelson Xess

10/6/24 10/6/24 10.6.24

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

PART – A: Introduction			
Program: Bachelor in Life Science (Honors/ Honors with Research)		**Semester -VIII**	**Session: 2024-25**
1	**Course Code**	**MBSE-10 P**	
2	**Course Title**	**Lab. Course - MBSE-10**	
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 –** ➢ compare antibiotic sensitivity tests ➢ demonstrate mode of action of anti-microbial products ➢ relate sterility of various pharmaceutical products and their spoilage ➢ examine agencies for clinical approval of pharmaceutical products	
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 Teaching-Learning Periods: 30Hours

Module	**Topics (Course contents)**	**No. of Period**
Lab./ Field Training/ Experiment contents of Course	1. Study the antibiotic sensitivity by Disc Diffusion Method. 2. Study the antibacterial and antifungal effect of some plant extracts / natural products. 3. Find the minimum inhibitory concentration of a given antibiotic. 4. Sterility testing of pharmaceutical products- injectables, eye and eardrops.	**30**
Key Words	**Antibiotic sensitivity, MIV, injectables, Microbial Limit Test, FDA**	

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

Name and Signature of Convener and Members of CBoS

10/6/24 10/6/24 10-6-24 10.6.24 10.6.24 10.6.24 Dr. K. K. Pat Dr. Nelson Xess