

DEPARTMENT OF MICROBIOLOGY & BIOTECHNOLOGY

UNIVERSITY SCHOOL OF SCIENCES, GUJARAT UNIVERSITY,

AHMEDABAD 380 009.

M.Phil. MICROBIOLOGY SYLLABUS

From June 2017

- There shall be four theory papers and one dissertation.
- Three theory papers shall carry hundred marks (70+30).
- The candidate is required to submit research papers to the faculty for the third paper MIC-603.
- Two typed/computerised bound copies of the dissertation shall be submitted to the University during the final M.Phil.
- Each theory paper is divided into four units. Each unit will have equal weightage while setting question paper. Question or its sub question including the options will be set from the same unit.
- There shall be one study tour / field work during the academic term. It will pertain to different microbiology / environmental industries / research institute / various ecosystems even outside Gujarat State. The study tour is highly essential for studying pertains to industry.
- The fourth paper shall comprise of bound copy of dissertation thesis (200 marks).

Paper Number	Title	Course Credits
MIC-601	Research Methodology in Microbiology	4
MIC-602	Review Articles in Microbiology	4
MIC-603	Research Papers in Microbiology	4
MIC-604	Academic Training in Microbiology	4
MIC-605	Dissertation in Microbiology	8

M.Phil Syllabus

Paper MIC:601 Research Methodology in Microbiology

Marks :70+30

Unit 1

1. Introduction of Project Writing and Computer Skills
2. Research Problem
3. Research Design and application of biostatistics
4. Report Writing and Research paper writing
5. Computer in Research

Unit 2

1. Chromatography-HPCL,TLC,GLC
2. Spectroscopy and spectrometry
3. Microscopic techniques
4. Radiolabelling technique
5. Electrochemical Methods

Unit 3

1. Data representation in Biostatistics.
2. Measures of Central Tendency and Dispersion.
3. Regression and Correlation.
4. Introduction to Bioinformatics
5. Databases and bioinformatics tools.
6. Phylogenetic analysis

Unit 4

1. Culture dependent and culture independent approaches for studying microbial diversity in environment.
2. Isolation and Purification of microbial community nucleic acids from environment samples
3. Genome organization in prokaryotes.

4. Isolation and purification of Proteins
5. In vitro technique for gene manipulation

M.Phil. Syllabus

Marks :70+30

Paper MIC:602 REVIEW ARTICLES IN MICROBIOLOGY

UNIT 1

1. Methods for studying Microbial Diversity
2. Metagenomics of extreme environment
3. Functional microbiology of saline ecosystems
4. Microbial ecology for bioprocess design.
5. Information science for microbial ecology

UNIT 2

1. Advances in industrial microbial enzymes
2. Metabolites from soil bacteria
3. Enzymes from Halophiles
4. Cellulose degrading Enzymes.
5. Applications of microbial consortia

UNIT 3

1. Bioprospecting for natural products
2. Production of Biofuels and chemicals from bacteria.
3. Nanotechnology in Agriculture
4. Metabolic potential of endophytic bacteria
5. Applications of rDNA

UNIT 4

1. Algal bacterial interactions and applications
2. Role of fungi in increasing PAH degradation.
3. Enzymatic degradation of azo dyes.
4. Heavy metal bioremediation using microorganisms.
5. Tools and applications in synthetic biology

**PAPER MIC 603: RESEARCH PAPERS IN
MICROBIOLOGY**

Marks:70+30

There shall be 20 research papers to be studied in this paper

PAPER MIC :604 Academic Training in Microbiology

Practicals/ Projects/Field-Industrial visit/Seminar/ Department
teaching/Review Writing/etc. (INTERNAL)

Marks:100