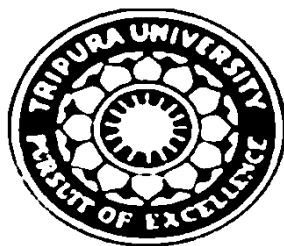


**Ph.D. MICROBIOLOGY COURSE WORK
CURRICULUM**

2014-15



DEPARTMENT OF MICROBIOLOGY

TRIPURA UNIVERSITY (A Central University)

SURYAMANINAGAR, AGARTALA – 799 022

TRIPURA, INDIA

Ph.D. MICROBIOLOGY SYLLABUS

TRIPURA UNIVERSITY

(w.e.f. session 2014-2015)

Syllabus prescribed for the degree of Doctor in Philosophy in Microbiology.

The following are the details for the Examination:

<u>Course work</u>	<u>Max Marks</u>
<u>Theory</u>	
Paper -1: RESEARCH METHODOLOGY AND SCIENTIFIC WRITING	(100)
Paper -2: BIOSTATISTICS, BIOETHICS, BIOSAFETY AND BIOINFORMATICS	(100)
Paper -3: RESEARCH TECHNIQUES IN CLASSICAL AND MODERN MICROBIOLOGY	(100)
<u>Practical</u>	
Paper -4: PROJECT BASED ASSIGNMENT AND REVIEW	(100)
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	Total 400

DEPARTMENT OF MICROBIOLOGY
SYLLABUS FOR PH. D COURSE WORK

Paper – I. RESEARCH METHODOLOGY AND SCIENTIFIC WRITING

(100)

Unit-1: An overview of research methodology

Research Concept, Selection and formulation of research problem, hypothesis and its logical justification. Literature survey: textual and digital resources.

Unit-2: Data collection & Interpretation

Research design; Research plan. Collection, documentation, analysis, presentation and interpretation of data.

Unit-3: Scientific writing

Article, notes, reports, review article, monographs, dissertations, popular science articles, References and bibliography.

Unit-4: Basics of Manuscript preparation for scientific publication

Formulation of outline, drafting title, sub titles, tables, illustrations; Formatting tables - title, body footnotes; Figures & graphs - structure, title and legends.

Unit-5: Presentation, reporting and citation of research articles

Ethics of publication, presentation of data, citation and journal impact factors.

Paper- III. RESEARCH TECHNIQUES IN CLASSICAL AND MODERN MICROBIOLOGY (100)

Unit-1: Microbial Isolation techniques

Methods of sample collection and preservation techniques; Surface sterilization, various culture techniques.

Unit-2: Characterization of microbial isolate

Morphological characterization by Phase contrast and Electron microscopy. Physiological characterization: growth behaviour studies, utilization of different carbon sources. Biochemical Characterization: estimation of extra-cellular enzymes, reducing sugars, free amino acids etc. Ribosomal DNA analysis, constructing phylogenetic trees.

Unit-3: Metagenomics

Non-culturable bacteria, New approaches for exploring non-culturable bacteria from environmental samples, culture independent molecular methods. FAME.

Unit -4 Analysis of molecular structure

Basics of crystallography, Biomolecular NMR, GC-MS and MALDI-TOF

Unit -5: Structural enzymology

Methods of enzyme purification and characterization using available biophysical and biochemical methods, protein-protein interactions and molecular docking.

Paper- IV. PROJECT BASED ASSIGNMENT AND REVIEW

(50 + 50=100)

- A. Project based assignment.
- B. Review and presentation.