

Mail

UNIVERSITY  OF MYSORE

DEPARTMENT OF STUDIES IN MICROBIOLOGY

**Dr. SHUBHA GOPAL**

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MGMB/BOS/37/2021-2022

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Date: 24/11/2021

To  
The Special Officer  
Syndicate section  
University of Mysore  
Mysuru -570 005.

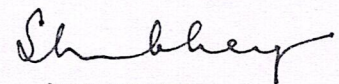
Sir,

Sub.: Submission of Hard copy and soft copy of BOS proceeding. Examiner's list for UG & PG Microbiology and amended syllabus of PG Microbiology- regarding Ref.: UA2/379/2013-14 dated 09-11-2021

With reference to above subject, I wish to bring it to your kind notice that the Board of Studies (BOS) in Microbiology PG and UG meetings were held on 23<sup>rd</sup> November 2021 at 10.30 am and 02.30 pm. respectively at DOS in Microbiology, Manasagangotri, Mysuru – 570 006. Hard copies of the proceedings of the meetings. Panel of examiners for Microbiology (UG and PG) and the amendments made to M. Sc, Microbiology syllabus are enclosed herewith for your kind perusal and needful action. The soft copy of the same has been e-mailed.

Thanking you

Yours faithfully

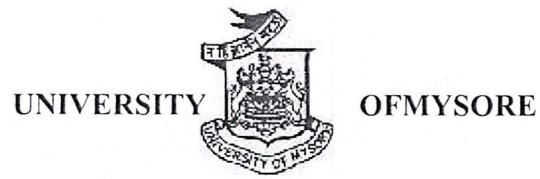


CHAIRMAN  
BOARD OF STUDIES  
MICROBIOLOGY (PG)  
UNIVERSITY OF MYSORE

Enclosures:

1. Proceedings of BOS – UG meeting
2. List of Examiners – B.Sc
3. Proceedings of BOS – PG meeting
4. Revised PG syllabus (2021-2022)
5. List of Examiners – M.Sc
6. Annexure – I ( Amendments)
7. Ph.D Course work Syllabus





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**Program:** Ph.D. in Microbiology  
**Course:** Course work

**DEPARTMENT OF STUDIES IN MICROBIOLOGY  
MANASAGANGOTRI  
MYSURU – 570 006  
2021 -22**

## Paper1: Advanced Research Methodology

### Ph.D. outcomes:

At the end of their PhD course, Research Scholars should:

- Be able to get into research and teaching lines in various institutions and universities.
- Have a thorough knowledge of the literature and a comprehensive understanding of scientific methods and techniques applicable to research;
- Be able to demonstrate originality in the application of knowledge, together with a practical understanding of how research and enquiry are used to create and interpret knowledge in their field;
- Have developed the ability to critically evaluate current research, techniques and methodologies;
- Have self-direction and originality in tackling and solving problems;
- Be able to act autonomously in the planning and implementation of research; and have gained oral presentation and scientific writing.
- Students get an adequate knowledge on patent and copyright for their innovative research works.
- During their research career, information in patent documents provide useful insight on novelty of their idea from state of the art search. This provides further way for innovations

### PhD Pedagogy:

The structure of the PhD course is designed to produce graduates with rigorous research and analytical skills, who are exceptionally well-equipped to go onto Postdoctoral research, or employment in industry, teaching and public service. While pursuing course work research student will study about various analytical, molecular, bioinformatic and statistical, which can be applied in the research field. They will be trained about scientific writing and development of research projects. They will be assigned with seminars and assignments which help them to improve their presentation and writing skill.

The PhD course provides:

- A period of sustained in-depth study of a specific topic;
- An environment that encourages the student's originality and creativity in their research;
- Skills to enable the student to critically examine the background literature relevant to their specific research area;

The opportunity to develop skills in making and testing hypotheses, in developing new theories, and in planning and conducting experiments; developing practical research skills and learn new state of the art techniques used in biomedical research. The opportunity to expand the student's knowledge of their research area, including its theoretical foundations and the specific techniques used to study it; the opportunity to gain knowledge of the broader field of biomedical research.

- An environment in which to develop skills in written work, oral presentation and publishing the results of their research in high-profile scientific journals, through constructive feedback of written work and oral presentations.

**Credit pattern: L:T:P – 3:1:0**



## Paper1: Advanced Research Methodology

### Unit:1

**Microbiology:** Good laboratory practices. Safety measures: Laminar airflow. Fume hood. Biosafety cabinets level I–IV, containment and clean labs. Isolation, Identification and preservation of microorganism, safe disposal of Microorganisms. Microscopy. Scanning and transmission microscopes, Inverted microscope, confocal microscopy, image processing methods in microscopy. Antimicrobial, Antioxidant Immunomodulatory, Anti diabetic assays. **Biocontrol:** identification, isolation, characterization. Strain improvement. delivery methods, package and practices.

### Unit:2

**Biomolecules and Analytical Methods:** isolation, purification and characterization of biomolecules, gel filtration, adsorption chromatography, ion exchange chromatography, affinity chromatography. GLC, HPLC. Electrophoretic techniques, two dimensional gel electrophoresis. UV/ visible spectrophotometry, fluorescence spectrophotometry, NMR spectroscopy, X-ray diffraction, mass spectrometry. Centrifugation. ELISA, immunoprecipitation and immunofluorescence. FISH, flow cytometry. MALDI-TOF, MS, 2D electrophoresis, ICP-MS, Biosensors, surface plasma resonance.

**Molecular Methods:** Properties of cloning and expression vectors (plasmid, phage) cloning and expression of DNA in bacteria and fungi, methods for analysis of gene expression at RNA. QRT PCR blotting techniques. PCR techniques RFLP, RAPD and AFLP techniques and their applications genome sequencing micro array techniques.

### Unit: 3

**Bioinformatics and Statistical Methods:** Use of database NCBI, EMBL, DDBJ, protein structural data bank sequence analysis of proteins and nucleic acids, structure prediction molecular modelling data mining methods, primer designing, web-based tools for sequence searches, BLAST and FASTA Population and sampling, Measures of central tendency and dispersion, Binomial, Poisson and Normal distribution, confidence interval: Errors: Annova (one and two way) Hypothesis testing Z score, "t" test, 'F' test. Chi-square test, regression analysis correlation: LSD, multiple range test data transformation, experimental designs.

### Unit:4

**Scientific Writing and development of Research projects:** Scientific document maintenance of laboratory data book. Organization and writing of a research paper, short communications, review articles, monographs, technical and survey reports authored books and edited books, dissertation and PhD Thesis, Preparing and delivering of oral and poster presentations, avoiding plagiarism, impact factor and citation index.

**Funding agencies:** National and international funding agencies for R & D projects. Preparation of R & D projects for funding: Organization of research project, identification of gap areas in the subject aims and objectives of the projects, possible outcome of the project, funds requirement and justifications. Biosafety and ethical issues. Bioethics, animal ethics and institutional ethical committee.

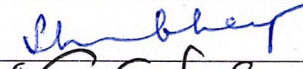
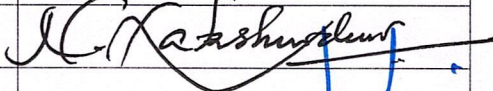





**Introduction to IPR:** Kinds of IPR: Patents, copyright, design, trademark, geographical indicators, industrial design and trade secrets. Patent Office and appellate board. India's new National IP policy- Govt. of India steps to promote IPR, career opportunities in IP.



DEPARTMENT OF STUDIES IN MICROBIOLOGY  
MANASAGANGOTRI, MYSURU

Proceedings of the Annual meeting of the Board of Studies in Microbiology (PG) held at 10.30 a.m. on 23<sup>rd</sup> November 2021, in the Department of Studies in Microbiology, Manasagangotri, Mysuru.

**Members Present**

1. Prof. Shubha Gopal	Chairperson	
2. Prof. N. Lakshmidevi	Member	
3. Prof. S.Satish	Member	
4. Prof. K.N. Amruthesh	Member	
5. Prof. N.S. Raju	Member	
6. Dr. R. Shylaja	Member	
7. Dr. M.N.Nagendra Prasad	Member	

**Members Absent**

1. Prof. Umamaheswari
2. Prof. M.Y.Sreenivasa

The Chairperson welcomed the members of the Board of Studies (PG) for the meeting and the agenda was placed before them

**AGENDA**

1. Panel of Examiners for M.Sc., Microbiology Examination.

**Prepared the examiner's list and list is enclosed herewith.**

2. Any recommendation/changes with respect to the M.Sc., and Ph.D course work programme. (only minor changes)

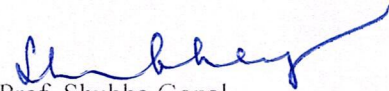
**Minor changes were made for M.Sc Microbiology programme and they are as follows.**

- Course MB 1.1 Virology – 2%
- Course MB 1.3 Mycology – 2%
- Course MB 2.3 Food Microbiology – 2%

3. Any other matter with permission of chair.

-Nil-

**The Chairperson concluded the meeting by thanking the members.**

  
Prof. Shubha Gopal  
Chairperson  
BOS in Microbiology (PG)  
University of Mysore.

Annexure – I : Amendments in PG Microbiology Programme

1. Course MB 1.1 Virology – 2%

Added the following topic in Unit – IV

- COVID-19 and variants

2. Course MB 1.3 Mycology – 2%

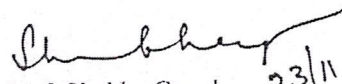
Added the following topic in Unit – III

- Opportunistic fungal infections: *Candida albicans*, *Aspergillus fumigatus* and *Mucor mycosis*.

3. Course MB 2.3 Food Microbiology – 2%

Added the following topic in Unit – II

- Prebiotics and Probiotics.

  
Prof. Shubha Gopal 23/11  
Chairperson  
BOS in Microbiology (PG)  
University of Mysore.