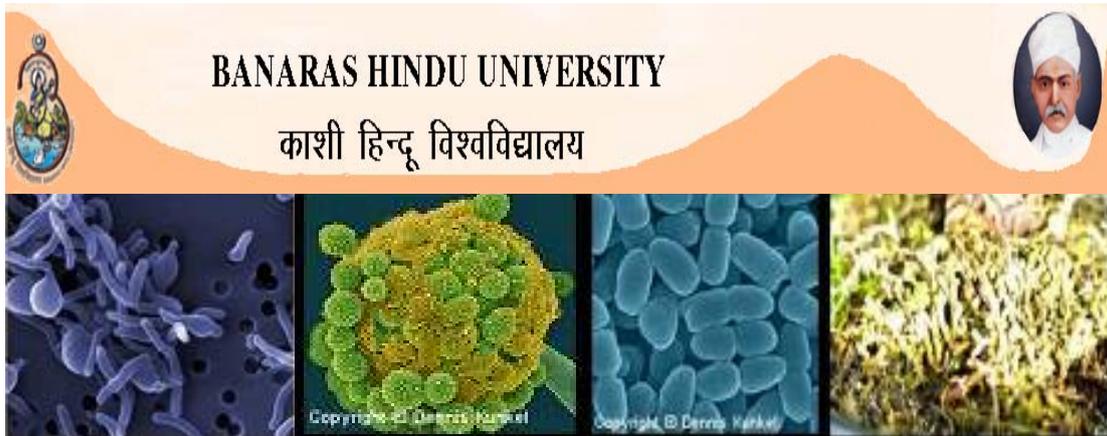


Applied Microbiology Department of Botany Faculty of Science



M. Sc. programme in Applied Microbiology Special Course of Study

M.Sc. course in Applied Microbiology was introduced during the session 2005-2006, in the Department of Botany with an intake capacity of 23 students. Applied microbiology is among the various subdivisions of microbiology. It encompasses a wide area of study, consisting of immunology, epidemiology, microbial metabolism, virology, pathogenic bacteriology, mycology, metabolism, industrial, agricultural and medical biology. It has many scientific applications in research fields. This exciting programme provides a launch pad into a career that involves working knowledge of scientific research and academics, health clinics and industries.

Objectives of the programme:

On completion of the course candidates shall have achieved the following objectives:

- A detailed knowledge of structure, function and application of microorganisms.
- Skills in handling microorganisms in the laboratory.
- An understanding of applications of microorganisms in the industry, health-care, environmental protection, food agriculture and research.
- Understanding current trends in microbiology and critically appraising published work.
- Demonstrating an ability to design, undertake and interpret a research project presented in the form of a dissertation.

Salient Features:

- In-depth interactive lectures.
- State-of-the-art lab exercises.
- Individual research projects.
- Summer training and dissertation.
- Guest lectures and seminars.

COURSE CONTENT

1) Theory

M. Sc. 1st Year

1st Semester

- | | |
|--|--|
| 1. General Microbiology | 1. Microbial Genomics |
| 2. Enzyme and Microbial biotechnology | 2. Biochemical and Molecular Techniques & Bioinformatics |
| 3. Microbial Physiology and Biochemistry | 3. Immunology |
| 4. Microbial Genetics | 4. Environmental Microbiology |

2nd Semester

M. Sc. 2nd Year

3rd semester

- | | |
|----------------------------------|--------------------------------|
| 1. Summer training | 1. Fermentation Technology |
| 2. Dissertation and Project Work | 2. Medical Microbiology |
| | 3. Agricultural Microbiology |
| | 4. Food and Dairy Microbiology |

4th semester

Program specific Electives (in 4th Semester)

- | | |
|--------------------------------|---|
| • Microbiology of wastewater | • Microbial Bio-geochemistry |
| • Useful Microorganisms | • Microbial biodiversity: Monitoring and Management |
| • Cyanobacterial Biotechnology | • Bio-fertilizer Technology |

2) Laboratory practical:

- Basic techniques in microbiology.
- Molecular microbial genetics.
- Fermentation Technology.
- Immunology & Medical microbiology
- Dairy microbiology
- Soil and Environmental microbiology

ACADEMIC INITIATIVES OF EXCELLENCE:

The goal of this programme has been to create a dynamic environment that facilitates interaction and dialogue. The strength of this programme can be attributed to the commitment of the management, its team of distinguished educators, its creative and dedicated students and the founder's determination to make this programme a course of excellence.

Admission Procedure:

The Department has a rigorous selection procedure for admitting students into this programme. To ensure the best minds get admission to this course, it admits 31 students, by screening them on **All-India Entrance Examination**, and interview thereof.

System of credits:-

Each Course shall have a specified number of credits. These credits describe the weightage of course. The number of credits that the student has satisfactorily completed measures performance of the student. Satisfactory progress of a student is subject to his/her maintaining a minimum Grade point average (CGPA). A certain minimum number of credits as specified in the syllabus must be earned by the students to qualify for the degree.

Quality Assurance:-

The teaching-learning is a well-planned process. The course's learning-centered approach ensures that students learn; rather than get taught. The programme has been well-designed so that students have a blend of

knowledge, skill, and the right-attitude components in them. The assessment examinations conducted twice a semester ensure quality of learning and allow for any mid-course corrections needed for slow learners.

Grooming students:-

The Department encourages students to hone their skills in various aspects of microbiology; so that they excel in global market place, which is the primary aim of the course.

During the third semester of the course, students undergo 2 month summer training, and 4 months' project in various laboratories, of institutes such as ICAR, CSIR and pharmaceutical companies, to have an on-site experience of handling different instruments.

Important workplaces, where students have conducted training and dissertation, include the following:

- ACTREC-Tata Memorial Center, Navi Mumbai.
- All-India Institute of Medical Sciences, (AIIMS), New Delhi.
- ALKEM Pharmaceuticals Limited, Mumbai.
- Bhabha Atomic Research Centre (BARC), Trombay, Mumbai.
- Centre for cellular and molecular biology (CCMB), Hyderabad
- Central Drug Research Institute, Lucknow
- Centre of DNA Fingerprinting and Diagnosis (CDFD), Hyderabad
- Cadila pharmaceuticals, Ahmedabad
- Defense Research and Development Organization (DRDO), New Delhi
- Hyderabad central University (HCU), Hyderabad
- Institute of Microbial Technology (IMTECH), Chandigarh
- Institute of Medical Sciences, BHU, Varanasi
- Indian institute of Chemical technology (IICT), Hyderabad
- Indian toxicology research centre, (ITRC), Lucknow
- Jawaharlal Nehru University, New Delhi
- Jawaharlal Nehru centre for advanced scientific research, Bangalore
- National Bureau of Agriculturally Important Microorganism, Mau
- National Centre for Biological Sciences (NCBS), Bangalore.
- National Centre for Cell Sciences (NCCS), Pune
- National Chemical Laboratory, Pune
- National Botanical Research Institute (NBRI), Lucknow.
- National institute for Plant Genomic Research (NIPGR), New Delhi.
- National Environmental Engineering Research Institute (NEERI), Nagpur.
- National institute for communicable diseases (NICD), New Delhi
- Raja Ramanna Centre for Advanced Technology, Indore.

Nurturing Faculty:

Providing the best faculty has been the motto of Department. It is believed that post-graduate teaching, in order to be effective, must be done by teachers who have been involved in research in their respective areas of specialization. The continual all-round growth of the programme is organized by faculty members in the department and guest faculty from other Departments of BHU.

For further information, please contact:

Course Coordinator:

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Message from the Co-ordinator

Prof.B.K.Roy

Applied Microbiology, a self sponsored course, under the esteemed roof of Department of Botany has a vision to comply the students with the advancing standards of the various sectors of Pharmaceutical, Agriculture and allied companies.

Applied Microbiology, today promises to provide our economy with the next big thrust.

The large number of jobs being created in the sector and the immense research activities going on in the field make it one of the fastest growing and challenging fields of education.

With the course structure and type of experience, the students will benefit profoundly in gaining exposure to the latest trends and concepts, which will equip them with the facility of building a successful career. I wish them all the success in whatever they indulge in for the uplift of the society.