

CAREERS360

YOUR QUICK GUIDE
TO A COURSE IN

MICROBIOLOGY

IT IS ALL ABOUT MICROBES - GOOD, BAD OR UGLY



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INTRODUCTION

MICROBES ARE VITAL FOR VARIOUS LIFE PROCESSES. THEY COULD EVEN LEAD THE WAY TO END OUR DEPENDENCE ON FOSSIL FUELS!

What is viral fever? Why the 'holy' water in Ganga never goes bad? What is the buzz about probiotics?

All these are made up of the microbes all around us. The microbes of different kinds make up the good, bad and often ugly states of our daily lives. The extremely small living organisms are not always bad. They are vital for various life processes and beneficial, too. They also have a number of industrial uses. One day they could even lead the way to end our dependence on fossil fuels! Therefore, it becomes important to classify and study them. An undergraduate course is "most certainly" the appropriate choice for aspiring microbiologists, says Prof. V. Nagaraja, Chairman, Department of Microbiology and Cell Biology, Indian Institute of Science, Bangalore. ▣

FAST FACTS

Programme: BSc in Microbiology
Eligibility: PCB in 10+2
Duration: 3 years **Course Fee:**
 Panjab University: GEN: Rs. 20160/- per annum, Rs. 31500 per semester at LPU **Best Institutes for Bachelor's:** University of Calicut, Panjab University, Lovely Professional University, Phagwara, Shivaji University, Kolhapur, Osmania University, Hyderabad, Kakatiya University, Warangal, JECRC University, Jaipur

ELIGIBILITY NORMS

THE ADMISSION IS BASED EITHER ON CUT-OFF MARKS IN 10+2 OR ON ENTRANCES.

If you aspire to go for BSc. (Hons.) you must have passed 10+2 with Physics, Chemistry and Biology. Some universities prescribe a 50 percent cut-off in the PCB aggregate. The admission is based either on cut-off marks in 10+2 or on entrances. Admission to Delhi University is based on the cut-off list of aggregate marks in 10+2. Universities such as West Bengal University of Technology admit students based on meritorious performance in Common entrance test. To apply to Panjab University you need to have 50% marks in PCB and also qualify the entrance test conducted by it. ▣

COURSE STRUCTURE

A COURSE IN MICROBIOLOGY IS STRUCTURED TO COVER SIGNIFICANT AREAS THROUGH THEORY AS WELL AS PRACTICAL SESSIONS.

The programme is designed to provide students with microbial education and training for a career in research and teaching. It offers wide areas for specialisation ranging from bacteriology, virology to genetics. The course is multidisciplinary and interdepartmental in nature, says Prof. V. Nagaraja, “A wholesome approach involving a large number of experiments, and modern communication tools and interactive sessions, in addition to conventional classroom teaching, is required for the study of Microbiology.”

The course is structured to cover significant areas through theory as well as practical sessions.

The final year course at Delhi University is devoted to specialisation in medical, industrial; food and dairy microbiology, and recombinant DNA technology.

Select Institutes For Master's/ Research: Delhi University, University of Pune; VIT University, Vellore; Bharati Vidyapeeth University, Pune; Kakatiya University, & Jiwaji University, Warangal; Kurukshetra University, Kurukshetra; Guru Nanak Dev University, Amritsar; Department of Microbiology, All India Institute of Medical Sciences, New Delhi; Mahatma Gandhi Medical College and research Institute, Pondicherry **Job Roles:** (For UG/ those with higher qualification): Virologist, Pathologist, Immunologist Microbiologist, Biochemist **Job sectors:** Health diagnostics, Pharmaceuticals, Food and Beverages, Environment, Agriculture

Himachal Pradesh University allows students to take up a course as varied as Environmental Microbiology to gain 50 marks in the final semester.

During the course, students are educated on the general sciences like chemistry, physics, microbiology, mathematics and statistics alongside complementary courses in genetics, immunology, molecular and cell biology.

An internship towards the end of the course gives the students an opportunity to experience the professional role they will acquire. It trains them in project management and documentation of their observations. This can be a valuable asset if you are keen on taking up a job straight after graduation. ▣

INSTITUTES OFFERING MICROBIOLOGY

SOME UNIVERSITIES OFFER MICROBIOLOGY AS A SPECIALISED COURSE WHEREAS SOME OTHERS OFFER IT AS A COMBINATION.

Delhi University has a number of affiliated colleges to conducting this course. A specialised BSc degree course is conducted by University of Calicut in Medical Microbiology spread across eight semesters. A dual-degree programme at Lovely Professional University grants both BSc and MSc in Microbiology on completion of the 5-year course.

If you are interested in a diploma courses, you may opt for University of Mumbai to complement your degree in Biology. Osmania University awards BSc degree where microbiology is taken up as a combination with Biotechnology and Chemistry. ▣

MEDICAL MICROBIOLOGY VERSUS MICROBIOLOGY

YOU CAN TAKE UP MEDICAL MICROBIOLOGY IF YOU ARE KEEN ON SPECIALISING WITHIN THE MEDICAL HEALTH SPECTRUM.

An increasing number of institutes are offering a 3-year undergraduate course in Medical Microbiology. The course starts with basic concepts of microbiology and biochemistry but evolves into anatomy, pathology, haematology and immunology in the later years. University of Calicut and Kanpur University are some of the universities offering BSc degree course. The eligible candidates should have passed 10+2 in PCB. This course focuses more on the concepts of microbiology and immunology in the light of human diseases. It is beneficial for a student keen on specialising within medical health spectrum of microbiology. ▣

CAREER OPPORTUNITIES

A NUMBER OF MANUFACTURES LIKE PFIZER, DABUR, BRITANNIA AND ROCHE DIAGNOSTICS OFFER JOB OPENINGS.

The graduate training prepares student for a research career in institutions from health, medicine, agricultural and environmental sectors. Apart from that, pharmaceutical, food and beverage, manufacturing and chemical engineering companies offer positions for young microbiologists. These include some renowned names like, Pfizer, Dabur, Britannia, Roche Diagnostics, etc.

Examination of the role of microbes in health and diseases describes the role of a microbiologist medical and health sector. As a quality control manager you may supervise regulatory processes at such industries.

Many undergraduate students pursue the academic route by taking up postgraduate and doctoral studies. Postgraduate and research opportunities abound in India and abroad. “Currently

major revolution in microbiology research is going on to match industry needs in India,” informs Prof. Nagaraja.

A doctoral degree offers you specialisation and so it will boost your career opportunities within a niche area. ▣

INDUSTRY TALK

Dr. Shruti Dantoft

Postdoctoral Fellow

The Technical University of Denmark, Copenhagen

Q: Why take up a course in Microbiology?

A: The world of microbes is absolutely fascinating; we are at the tip of the iceberg of microbial discovery. Not only are there several species of microbes yet undiscovered, we are still trying to understand the physiology as well as interactions within the microbial world. Microbes have helped us better understand our own physiology.

Q: What are the industrial prospects of Microbiology?

A: Microorganisms are also finding industrial uses – they are robust and can be genetically manipulated or adapted to produce compounds of interest. They are used for biomedical research as well as biotechnological production of medicinal products such as insulin. Their potential is vast and yet unexplored and studying them is perhaps even more vital in our world today. They could lead the way to end our dependence on fossil fuels – the possibilities are endless and the microbial future is bright!

Q: How do you describe your journey from a student to a professional in Microbiology?

A: I became interested in microbiology while studying food microbiology and genetics, and I wanted to expand my knowledge in the area of probiotic bacteria.

I ended up doing a PhD with yeasts, which are incidentally my best friends, considering they make two of my favorite food products (wine and cakes!).

Professionally, it has opened doors for me, both within the industry as well as academia, and I have been lucky to work in both areas.

Q: How has a research specialisation helped your career in Microbiology?

A: The PhD was an opportunity to study and investigate *Saccharomyces cerevisiae* (a species of yeast) but also learn several techniques in the field of microbial physiology. During my PhD I gained a better understanding and respect for the world of microorganisms, and it also led to my future jobs! Pursuing a PhD is pursuing a specialisation, so it boosts your career opportunities within a niche area, but it also limits a broader career scope due to the specialisation within a limited area. It's a wonderful opportunity to prolong your carefree student life and get your hands dirty in a lab (laughs). ▣

Select Institutes offering BSc Microbiology

University of Calicut
Panjab University
Lovely Professional University, Phagwara
Shivaji University, Kolhapur
Osmani University, Hyderabad
Kakatiya University, Warangal
JECRC University

B.Sc (Hons.) Microbiology at Delhi University colleges

Bhaskaracharya College of Applied Sciences
Gargi College
Institute of Home Economics

Ram Lal Anand College
Swami Shradhdhanand College

Institutes offering BSc in Medical Microbiology
University of Calcutta
Kanpur University
Sai group of Institutions, Dehradun
Kannur University, Kerala
Mahatma Gandhi University
Dolphin Institute, H.N.B. Garhwal Central University

Select Institutes For Master's/Research:
Delhi University, Delhi
University of Pune, Pune
VIT University, Vellore
Bharati Vidyapeeth University, Pune
Kakatiya University, Warabgal
Jiwaji University, Gwalior
Kurukshetra University, Kurukshetra,
Guru Nanak Dev University, Amritsar,
Department of Microbiology, All India Institute of Medical Sciences, New Delhi

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