



## Master of Science - Industrial Biotechnology Course Guide

## Course Overview

Industrial biotechnology is a set of practices that use living cells (such as bacteria, yeast, algae) or component cells like enzymes, to generate industrial products and processes. Products include biomass-based materials such as fuels and chemicals, while processes include the treatment of waste water and energy efficiency measures. The course is “one of its kind” that integrates academic knowledge with hands on industrial exposure, ensuring a holistic programme towards development of industry ready talent and it also holds great promise to solve global challenges, offering new potential for meeting the world's demand for food, feed, fuel, materials, and more while reducing our impact on the environment.

### Programme Name

**Master of Science**

### Programme Code

**044**

### Course Code & Name

**4415 – M.Sc in Industrial Biotechnology\***

### Degree Awarded

**Master of Science**

### Duration of the Programme

**2 years, 4 semesters**

### Total Credits

**100**

### Eligibility

The minimum qualification required to apply is a bachelor's degree recognised by UGC with Chemistry / Biochemistry and any 2 of the following subjects from life sciences - Botany, Zoology, Biochemistry, Biotechnology, Microbiology, Genetics, Environmental Sciences, Applied Botany, Applied Zoology, Applied Genetics, Molecular Biology

### Medium of Instruction / Examination

**English**

## Study Campus

### Academia:

Center for Post Graduate Studies

Jayanagar 3<sup>rd</sup> Block, Bangalore 560 011

### Industry:

Bangalore Biotech Labs Pvt. Ltd.

49/2, Gubbi Cross, Hennur – Bagalur Main Road

Kothanur Post, Bangalore 560 077

## Programme Timings

8.30 am – 4.30 pm (Mon – Fri) & 8.30 am – 1.00 pm (Sat)

## Course Advisor

Dr. Sudha Deshmukh

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*\*Jointly offered with BiOZeen*

## Course Curriculum

### Semester I

- Biomathematics and Biostatistics
- Molecular Cell Biology & Immunology
- Gene Technology
- Biological Chemistry

#### Learning Labs

- Molecular Cell Biology, Immunology & Gene technology
- Biological Chemistry

### Semester II

- Sterility & Aseptic Processing in Biotech Industry
- Industrial Microbiology & Fermentation Process
- Mammalian Cell Culture Technology
- Food Biotechnology

#### Learning Labs

- Upstream Processing

- Sterile Engineering & Filtration

### **Semester III**

- Bio separation Technology
- Bioprocesses & Bioreactor Design
- Principles of Biologics Production

#### **Elective (any one)**

- Environmental Biotechnology
- Industrial Enzymes
- Algae Biotechnology
- Plant Cell Biotechnology

#### **Learning Labs**

- Down Stream Processing
- Elective

### **Semester IV**

- Principles of Vaccine Development
- Biologics Formulation & Stability Analysis

#### **Elective (any one)**

- Nano Biotechnology
- Quality Control and Assurance of Biotech Products
- Industrial Management
- Food and Drug Regulations
- Entrepreneurship in Biotechnology
- Plant Design & Automation
- Computational Methods in Industrial Biotechnology

#### **Learning Labs**

- Project - Presentation & Defence
- Comprehensive Viva-Voce

### **Career Opportunities**

The course will open up avenues in the areas of Life Sciences & Research, Food & Beverage, Agro Biotech, Healthcare (Pharmaceutical / Biopharmaceutical / Nutraceuticals) & Consultancy domain of Biotechnology.