



**College of Arts,
Science &
Commerce**

RISE WITH EDUCATION

(Autonomous) Sion (West), Mumbai – 400022

Faculty: Science

Program: B.Sc.

Subject: MICROBIOLOGY

Academic Year: 2024– 2025

AS PER NATIONAL EDUCATION POLICY 2020

Choice Based Credit System (CBCS)

S.Y.B.Sc. (OE)

**Revised Credit Based Semester and Grading Syllabus approved by
Board of Studies in Microbiology brought into effect from June
2024**

Approved in academic council meeting on 7th August 2024

PROGRAM OUTCOME (PO)

At the end of an Undergraduate Program, a student would have obtained the following:

- **PO1. Solving Complex Problem:**

Applying the knowledge of various courses learned under a program with an ability to break down complex problems into simple components, by designing processes required for problem solving.

- **PO2. Critical Thinking:**

Organizing thoughts to identify assumptions, verifying the accuracy and validity of assumptions, making informed decisions that guide actions (at Institutional, Personal and Intellectual level), developing the ability to think with different perspectives and ideas.

- **PO3. Reasoning ability and rational thinking:**

Developing rational thinking on the basis of acquired contextual knowledge, assessing societal, public health and safety, cultural, legal, gender, ethnic and environmental issues, and performing with decisive responsibility.

- **PO4. Research skill:**

Utilizing the contextual knowledge in an interdisciplinary framework. Integrating research-based knowledge and research methods involving problem definition, analysis and interpretation of data, synthesis of the information to provide valid conclusions. Exercising analytical skill, research ability, creativity, for employability and collaborating with industries.

- **PO5. Effective Communication skill:**

Facilitating to speak, read, write and listen effectively through both formal language and in one's own mother tongue, in order to make meaning of the world around. Enabling to comprehend and write effective reports and documentation, make successful presentations, give and receive clear instructions.

- **PO6. Proficiency with ICT:**

Equipping to create, select, apply appropriate tools and techniques, resources through electronic media for the purpose of gathering, analyzing data and drawing inference with an understanding of its merits and demerits.

- **PO7. Social Interactive Skills and team work:**

Eliciting networking with people, mediate disagreement and help reach conclusions in group settings.

Functioning effectively as an individual, and as a member in diverse groups, and in multidisciplinary settings exhibiting adaptability, leadership quality and team-building

- **PO8. Ethical values:**

Recognizing and respecting different value systems including one's own, to understand the moral dimensions of one's decisions, intention to help the society and feeling good about it, commitment to professional duties and responsibilities.

- **PO9. Self-directed Learning:**

Acquiring the ability to explore and gain knowledge in independent ways, keep evolving lifelong in the broad context of socio-technological changes.

- **PO10. Sensitization towards Environment and Sustainability:**

Understanding the need for sustainable development and concern for environmental issues, realizing the importance of cohabitation, co-evolution in our achievements of sustainable development goal

- **PO11. Gender Sensitization:**

Demonstrating knowledge and understanding of gender equity-issues and gender justice.

- **PO12. Civic Values and Global Citizenship:**

Expressing empathetic social concern while helping others when their rights are violated, no matter where in the world they live, to act with an informed awareness on issues, to participate in civic life by volunteering for social justice.

PROGRAMME SPECIFIC OUTCOMES (PSO) (FOR MICROBIOLOGY)

- PSO1: Students will be introduced to the subject of Microbiology which is not taught at the junior college
- PSO2: Eloquence in specific phraseology pertaining to the subject of microbiology.
- PSO3: Familiarize with the theories and techniques of the various areas in microbiology.
- PSO4: Obtain expertise in essential practical techniques required in microbiological analysis and prepare for advance studies.
- PSO5: Discuss the applications of microorganisms in the various fields of microbiology.

OPEN ELECTIVE (Interdisciplinary)		
SEMESTER III		
SIUMIOE221	Microbiology in everyday life - I	2 Credits
Unit I	Introduction to biology, food microbiology and immunity	15 lectures
Unit II	Tutorial	15 lectures

OPEN ELECTIVE (Interdisciplinary)		
SEMESTER IV		
SIUMIOE221	Microbiology in Everyday life - II	2 Credits
Unit I	Introduction to agriculture microbiology, microbial infections and antibiotics	15 lectures
Unit II	Tutorial	15 lectures

S.Y.B.Sc. MICROBIOLOGY SYLLABUS

SEMESTER III

OPEN ELECTIVE (Interdisciplinary)

Course: Microbiology in Everyday Life - I

Course code: SIUMIOE211

Course Outcomes (CO)

At the end of the course the students will be able to:

1. Recognize a prokaryotic and eukaryotic cell
2. List the role of microbes in fermented dairy products
3. Describe the importance of microorganism in human health
4. Define immunity and distinguish between innate and acquired immunity

COURSE CODE	OPEN ELECTIVE	2 CREDIT
SIUMIOE211	Microbiology In Everyday Life - I	15 LECTURES
UNIT	TOPIC	LECTURES
Unit I	<ol style="list-style-type: none">1. Introduction to biology2. Food microbiology- Fermented foods- Dahi, cheese, butter3. Industrial production of cheese4. Microorganisms and human health - Normal flora, Good bacteria, Bad bacteria, Types of Immunity- innate and acquired	15
Unit II	Tutorial <ol style="list-style-type: none">1. Cell types2. Milk products involving microbes3. Cheese production4. Immunity	15

**SYBSc Microbiology Syllabus
Semester 4
OPEN ELECTIVE (Interdisciplinary)**

Course: Microbiology in Everyday Life - II

Course code: SIUMIOE221

Course Outcomes (CO)

At the end of the course the students will be able to:

1. Recognize a prokaryotic and eukaryotic cell
2. Outline the microbes that cause common infections like Malaria, dengue, typhoid, COVID
3. List the role of microbes in agriculture
4. Review the use of microorganisms for antibiotic production
5. Define antimicrobial drug resistance

COURSE CODE	OPEN ELECTIVE	2 CREDIT
SIUMIOE221	Microbiology In Everyday Life - II	15 LECTURES 1 CREDITS
UNIT	TOPIC	LECTURES
Unit I	<ol style="list-style-type: none"> 1. Introduction to biology 2. Microbes and agriculture -Biofertilizers, biopesticides, bioherbicides 3. Microorganisms and human health -Malaria, dengue, typhoid, COVID 4. Antibiotic production and drug resistance 	15
Unit II	Tutorial <ol style="list-style-type: none"> 1. Prokaryotic cell & Eukaryotic cell 2. Microbes and agriculture 3. Vector borne diseases 4. Antibiotic production and drug resistance 	15