SARVAJANIK UNIVERSITY

INCLUSIVE | INTEGRATED | INNOVATIVE

creating an enlightened society...

Faculty of Science

SHREE RAMKRISHNA INSTITUTE OF COMPUTER EDUCATION AND APPLIED SCIENCES, SURAT

M.Sc. Industrial Microbiology

Syllabus

(Effective from 2021)

M.T.B Collge Campus, B/h P.T.Science College, Opp. Chowpati,
Athwalines, Surat-395001 Gujarat, India
Contact: 7228018498, 728018499. Email: info@srki.ac.in

M.Sc. Industrial Microbiology	
No.	**Contents**
A	**About M.Sc. Industrial Microbiology Programme**
B	**Programme Objective**
C	**Eligibility**
D	**Course Structure**
E	**Evaluation Scheme**
F	**Syllabus**

A. About M.Sc. Industrial Microbiology Programme

The M.Sc. Industrial Microbiology programme offered by Sarvajanik University is of two years' duration and is divided into four semesters. The various courses of the programme are designed to include classroom teaching and lectures, laboratory work, project work, viva, seminars, assignments and field trips. Three categories of courses are being offered in this programme: Core courses, Skill enhancement courses and Elective course. A separate research-based course that leads to a dissertation is also one of the Core Courses offer in the final semester. The student presents his/ her research orally at the end of the semester, and this is coupled to a *viva-voce*. This not only equips the student for a career in research/ industry, but also fosters self-confidence and self-reliance in the student as he/she learns to work and think independently. Thirty percent of the total marks for each course will be awarded through Internal Assessment. Particular emphasis is laid on the practical aspects of the field. Students are taught how to plan experiments, perform them carefully, analyze the data accurately, and present the results both, qualitatively and quantitatively.

B. Programme Objective

- Through the stimulus of scholarly progression and intellectual development the programme aims to equip students with excellence in education and skills, thus enabling the student to pursue a career of his/her choice.
- By cultivating talents and promoting all round personality development through multi-dimensional education a spirit of self-confidence and self-reliance will be infused in the student.
- The student will be instilled with values of professional ethics and be made ready to contribute to society as responsible individuals.

C. Eligibility

- A candidate must have passed Bachelor's degree in Microbiology / Medical Technology/Biotechnology/Environmental Science / Industrial Microbiology /Bioscience / General Science/ Life-Science / Botany/Plant Science/Zoology/Animal Science/ Biology /Agriculture/Fisheries/Forestry /others.

- The candidate who has passed equivalent exam from other subjects or boards need to avail eligibility certificate for this programme from the Board of Equivalence (BoE) of the Sarvajanik University.

D. M.Sc. Industrial Microbiology Course Structure

Sem	Course Type	Course Code	Paper Title	Hours/Week		Credit
				Th	Pr	
1	Core course	DSC-1	Principles of Industrial Microbiology	4	4	4+2
		DSC-2	Fermentation Technology	4	4	4+2
	SEC	SEC-1	Molecular biology & Genetic Engineering	4	4	4+2
	Elective	DSE-1		4	4	4+2
2	Core course	DSC-3	Microbial Physiology & Metabolism	4	4	4+2
		DSC-4	Principles of Biochemical Engineering & Bioseparation	4	4	4+2
	SEC	SEC-2	Instrumentation and analytical techniques	4	4	4+2
	Elective	DSE-2		4	4	4+2
3	Core course	DSC-5	Microbial products	4	4	4+2
		DSC-6	Enzyme & Immuno Technology	4	4	4+2
	SEC	SEC-3	cGMP & Quality Assurance	4	4	4+2
	Elective	DSE-3		4	4	4+2
4	Core course	DSC-7	Dissertation	32		16
		DSC-8	Seminar Presentation			4
		DSC-9	Review of published research paper/Article			4
					Total Credit	96
Note: DSC – Discipline Specific Core, DSE - – Discipline Specific Elective, SEC - Skill Enhancement Course						

Semester	DSE (Any one to be opt)
1	1. Food Chemistry 2. Energy and Environment 3. Laboratory safety and management 4. Bioethics & Biosafety
2	1. Forensic Chemistry & Toxicology 2. Bioinformatics & Other “OMICS” 3. IPR 4. Biostatistics.
3	1. Forensic biology and DNA typing 2. Research Methodology 3. Bio-entrepreneurship 4. Application of Green Chemistry

E. Evaluation Scheme

M.Sc. Industrial Microbiology					
Evaluation	**Criteria**	**Theory**	**Practical**	**Dissertation**	**Seminar/ Review of published research paper**
Internal	Continuous & Comprehensive Evaluation (CCE)	40	60	140	60
	Attendance	10	10	10	10
	Assignment	20	----	----	----
	Internal Practical Test and Viva – Voce /	----	70	----	----
	Internal assessment	----	----	50	30
External	External Evaluation	30	60	100	50
	Total	100	200	300	150

F. Syllabus

Semester 4

Dissertation

Name of faculty: Science	**Department:** Microbiology
Program: M.Sc. Industrial Microbiology Sem-IV	**Type:** DSC-7
Subject: Dissertation	
Credit: 16	Total learning hours:

Course description:

The aim of the dissertation is to develop inclination towards research.The dissertation presents a major piece of guided independent research on a topic agreed between the student and their supervisor. It typically involves a literature review and an appropriate form of critical analysis of sources of primary and /or secondary data; it may involve field and/or laboratory work. The dissertation must show evidence of wide reading and understanding, of critical analysis and/or appropriate use of advanced research techniques.

Student learning outcome:

Upon successful completion, students will have the knowledge and skills to:

- Plan and engage in an independent and sustained critical investigation
- Systematically identify relevant theory and concepts, relate these to appropriate methodologies and evidence, apply appropriate techniques and draw appropriate conclusions
- Appropriately apply qualitative and/or quantitative evaluation processes to original data
- Understand and apply ethical standards of conduct in the collection and evaluation of data and other resources
- Communicate research concepts and contexts clearly and effectively both in writing and orally.

Guidelines for Dissertation

- Dissertation work can be done individually or in a group on a relevance topic.
- Dissertation may be carried in-house or outside the campus after due permission granted by the supervising teacher and institute head at the following recognized institutions or industries like:
  - Any UGC recognized University PG departments.
  - Any Agriculture University.
  - All National and State level research institute.
  - ISO or FDA/USFDA industry or research center having R & D and Q.C. facilities.
- The evaluation of dissertation includes thesis evaluation and its presentation.
- The presentation of dissertation shall be done in audio-visual mode by the candidate(s) within 15 minutes.
- The candidate(s) has to submit hard & soft (PDF) copy of their dissertation for evaluation.

****

SARVAJANIK UNIVERSITY

Seminar Presentation

Name of faculty: Science	**Department:** Microbiology
Program: M.Sc. Industrial Microbiology Sem-IV	**Type:** DSC-8
Subject: Seminar Presentation	
Credit: 4	Total learning hours:

Course description:

The study aims to reveal how the students improved their academic presentation skills and to improvement with influences of students' scientific and language backgrounds. This course engages students in critical inquiry through reading, discussion, oral presentations, and writing, emphasizing an in-depth exploration of the writing process from generating ideas to polishing the final draft.

As academic presentation skills are crucial to research and are a generic skill that PG students in science must acquire, we propose that existing student seminar programmes can be used effectively as an active training programme to improve such skills.

Student learning outcome:

Upon successful completion, students will have the knowledge and skills to:

- Students will demonstrate the ability to perform close and critical readings.
- Students will develop ability to comprehends the relevant topic and effectively explain it.
- Students will demonstrate the ability to follow discussions, oral arguments, and presentations, noting main points or evidence and tracking threads through different comments.
- Students will be able to challenge and offer substantive replies to others' arguments, comments, and questions logically.

Guidelines for Seminar Presentation

- Faculty will mentor the allotted students for selected topics of seminar.
- Students have to individually deliver a seminar on the advance or novel topic of relevance subject other than that mentioned in the curriculum.
- Topic should not be related to his/her dissertation.
- The seminar presentation shall be done in audio-visual mode by the candidate within 15 minutes.
- Students have to submit copy of color printed handouts (4 slides /page) of his/her presentation to the examiner.

****

SARVAJANIK UNIVERSITY

Review of published research paper/ article

Name of faculty: Science	**Department:** Microbiology
Program: M.Sc. Industrial Microbiology Sem-IV	**Type:** DSC-9
Subject: Review of published research paper/article	
Credit: 4	Total learning hours:
Course description: The objective of a literature review is to provide a critical evaluation of the data available from existing studies. The study of published research article is a survey of previously published research work on a topic. Study of research articles can identify potential research areas to be explored and gives new dimensions to the state of the knowledge along with open development of mind set for critical thinking.	
Student learning outcome: • Students will demonstrate the ability to identify the disciplinary context for different kinds of writing, including both informal writing and formal writing. • Students will demonstrate the ability to perform critical readings of their own writing and the writing of others. • Students will demonstrate the ability to proofread.	

Guidelines for review of published research paper/ article

- Student will individually select full length research paper related to the subject.
- The selected paper should be from a reputed peer reviewed journal having ISSN.
- Selected research paper should have been published during the last five years.
- Evaluation of review of published research paper/article includes audio-visual presentation by student within 15 minutes.
- Students have to submit copy of color printed handouts (4 slides /page) of his/her presentation to the examiner.

****