



SARDAR PATEL UNIVERSITY

NAAC 'A' Grade (10-01-2023 To 09-01-2028)

Vallabh Vidyanagar

Gujarat

Academic Program Structure

&

Curriculum

(Aligned with NEP-2020)

Master of Science in Biochemistry

NHEQF Level: 6.0 / 6.5

Entry NHEQF Level	:	5.5 / 6.0
Duration	:	Two Years
Total Courses	:	24
Total Learning Hours	:	2640
Total Credits	:	88
Total Marks	:	2200

Graduate Attributes (GAs)

Upon successful completion of the M.Sc in Biochemistry programme, graduates are expected to attain the following Graduate Attributes:

GA1: Disciplinary Knowledge

Ability to comprehend and apply fundamental concepts of chemistry to biological systems.

GA2: Problem Solving

Apply biochemical principles to solve complex problems.

GA3: Cognitive and Technical Skills/Practical Skills

Develop proficiency in advanced instrumentation and techniques (e.g., chromatography, electrophoresis, PCR, spectroscopy, cell culture).

GA4: Analytical Reasoning

Ability to make careful observations and apply lateral thinking and analytical skills to experimental results.

GA5: Research Skills

Formulate hypotheses and research questions, identify relevant sources, and read and write a research paper.

GA6: Critical Thinking

Ability to critically read and analyze scientific literature.

GA7: Teamwork and Collaboration

Participate constructively in scientific group work and discussions.

GA8: Creativity and Innovativeness

Capacity to develop novel approaches to tackle challenges in agriculture, health, environment, and allied biochemistry areas.

GA9: Autonomy, Responsibility, and Accountability

Ability to work independently in organizing laboratory work and designing experiments.

GA10: Communication Skills and Digital Literacy

Ability to use digital sources and various platforms to convey and explain concepts of biochemistry.

GA11: Ethical Reasoning and Moral Awareness

Reflect on ethical values and be aware of ethical and environmental issues.

GA12: Lifelong Learning

Retain and build critical thinking skills and continuously update scientific knowledge for practical applications.

Programme Educational Objectives (PEOs): Within 2 - 3 years of completing the Programme, the graduate will be able to

PEO1: Apply knowledge of various biomolecules, their properties and biochemical reaction fundamentals.

PEO2: Develop research skills and designing, execution and interpretation of biochemical experiments, which will be helpful to them for research, industry or academia job opportunities.

PEO3: Develop ethical principles and take professional responsibilities, contributing to societal needs in the field of Biochemistry.

PEO4: Gain advanced knowledge in Biochemistry, enabling them to innovate and apply biochemical research.

PEO5: Equipped with knowledge and skills necessary for various roles in the Biochemistry field including industry, academia and research.

Program Learning Outcomes (PLOs): Upon successful completion of the programme, learners will be able to:

PLO1: Demonstrate advanced and integrated theoretical and practical knowledge in Biochemistry relevant to postgraduate-level understanding.

PLO2: Apply critical thinking and analytical skills to interpret scientific information, identify problems, and develop effective solutions.

PLO3: Communicate scientific ideas clearly and effectively through written, oral, and digital formats for academic and professional contexts.

PLO4: Develop research aptitude by formulating hypotheses, analysing data, and adhering to ethical standards, including academic integrity and IPR.

PLO5: Integrate interdisciplinary knowledge to develop innovative conceptual and methodological approaches for solving complex biological problems.

PLO6: Work effectively both independently and collaboratively, demonstrating leadership, adaptability, and professional ethics.

PLO7: Exhibit social responsibility, ethical awareness, and commitment to equity and inclusive national development.

PLO8: Evaluate the societal and environmental impact of scientific practices and promote sustainable development.

PLO9: Engage in lifelong learning to adapt to evolving scientific, technological, and societal advancements.



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NEP-2020 aligned Curriculum with effect from Academic Year 2026-27

[Master of Science in Biochemistry]

Semester-I

Course Type	Course Code	Course Title	Teaching-Learning Scheme		Credits	Assessment Scheme & Marks				
			L-P-T	Total Notional Hours		Internal Assessment			External Assessment	Total Marks
						FA	SA	Total		
DSC	P2S01NCBIC01	Molecular Biology	4-0-1	120	4	30	20	50	50	100
DSC	P2S01NCBIC02	Physiological Biochemistry	4-0-1	120	4	30	20	50	50	100
DSC	P2S01NCBIC03	Molecular Cell Biology	4-0-1	120	4	30	20	50	50	100
DSC	P2S01NCBIC04	Laboratory Course -I	0-8-0	120	4	30	20	50	50	100
DSC	P2S01NCBIC05	Laboratory Course -II	0-8-0	120	4	30	20	50	50	100
DSE (Any One)	P2S01NEBIC01	Bioethics & Biosafety	2-0-0	60	2	15	10	25	25	50
	P2S01NEBIC02	Entrepreneurship Fundamentals	2-0-0							
	P2S01NEBIC03	Principles of Ecology	2-0-0							
	P2S01NEBIC04	Pharmaceutical Microbiology	1-2-0							
	P2S01NEBIC05	Mathematics Essentials for Biologists	2-0-0							
				660	22			300	250	550

DSC: Discipline Specific Core **DSE:** Discipline Specific Elective **L:** Lecture **P:** Practical **T:** Tutorial

FA: Formative Assessment **SA:** Summative Assessment **NOTE: TOTAL CREDITS 22 TOTAL MARKS: 550 PER SEMESTER**



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Semester-II

Course Type	Course Code	Course Title	Teaching-Learning		Credits	Assessment Scheme & Marks				
			L-P-T	Total Notional Hours		Internal Assessment			External Assessment	Total Marks
						FA	SA	Total		
DSC	P2S02NCBIC01	Bioanalytical Techniques	4-0-1	120	4	30	20	50	50	100
DSC	P2S02NCBIC02	Enzyme Technology	4-0-1	120	4	30	20	50	50	100
DSC	P2S02NCBIC03	Cellular and Molecular Immunology	4-0-1	120	4	30	20	50	50	100
DSC	P2S02NCBIC04	Laboratory Course -I	0-8-0	120	4	30	20	50	50	100
DSC	P2S02NCBIC05	Laboratory Course -II	0-8-0	120	4	30	20	50	50	100
DSE (Any One)	P2S02NEBIC01	Biostatistics Using R	2-0-0	60	2	15	10	25	25	50
	P2S02NEBIC02	Microtechniques	1-2-0							
	P2S02NEBIC03	Developmental Biology	2-0-0							
	P2S02NEBIC04	Molecular Endocrinology	2-0-0							
				660	22			300	250	550

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