

DEPARTMENT OF BIOCHEMISTRY

FACULTY OF SCIENCE

M. Sc. in Biochemistry &

M. Sc. in Medical Biotechnology

Prospectus and Admission Guidelines 2021(onwards)



THE MAHARAJA SAYAJIRAO UNIVERSITY OF BARODA

VADODARA-390002, GUJARAT, INDIA





H. H. Maharaja Sayajirao Gaekwad-III

MISSION STATEMENT

**Vision and mission as perceived by
H. H. Maharaja Sayajirao Gaekwad-III**

*“The progress of a nation requires that its people
should be educated. Knowledge is a necessity of man.*

*It instills in him a desire to question and to investigate,
which leads him on the path of progress. Education, in the
broadest sense, must be spread everywhere.*

*Progress can only be achieved by the spread of
education. Cooperation is necessary to achieve
any worthy end and this readiness to
cooperate will not be found in people*

Prof. C. RatnaPrabha

Head, Department of Biochemistry
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Head's message

Department of Biochemistry, established in 1955, is a pioneering Department in the country for Biochemistry teaching and research. The Department endeavours to produce competent Biochemistry professionals to meet the emerging needs of the society in academics, research and industry. Department of Biochemistry offers three academic programmes at present, M.Sc. in Biochemistry, M.Sc. in Medical Biotechnology and Ph.D. We welcome students who have keen interest in the “Actions and Reactions of Life” and want to find answers to many challenges therein.

About the Department

Department of Biochemistry was started as a part of the Department of Chemistry under the initiative of Dr. K. G. Naik in 1955. Under the leadership of Prof. C. V. Ramakrishnan, it grew into one of the major centres for research and post-graduate studies in Biochemistry and Nutrition. Department of Biochemistry takes pride in the strong research and development environment which has been a hallmark since its inception. Prominent research areas of the department include structural biology, protein engineering, protein folding and degradation, biosensors, cell death, metabolic engineering, soil microbes, plant growth, antibiotics and biofilm formation. The department is endeavoring to understand the mechanisms underlying various human diseases like Diabetes, Metabolic syndrome, Vitiligo, Polycystic ovarian syndrome, Fragile-X syndrome, Cancer, Hypothyroidism, Huntington's disease, and to develop potential cures by exploring new antibiotics, novel molecules, plant products and stem cells.

The Department offers two M. Sc programmes, M.Sc. in Biochemistry and M. Sc. In Medical Biotechnology. The Department has more than 40 research scholars working in frontier areas of biochemical research. Research has been supported by Extra Mural Research Projects funding from various government funding agencies including DBT, DST, UGC, CSIR, SERB, GSBTM, BRNS, ICMR, NRDC and GUJCOST. We also have a few industry sponsored projects. Department is connected with more than 45 scientists across the globe in terms of joint projects and collaborations. In last five years over 150 International peer reviewed research

papers were published and cited by over 8000 researchers across the globe. Our teachers are members on several national and international scientific forums to peer review and judge the quality of projects submitted to various funding agencies. Young scientists who are produced by the department are a matter of pride not only for the University but the nation as well.

Many national and international conferences and symposia have been organized in the last five years. Department has three lecture series in the names of 3 prominent professors who served the department, namely Prof. C.V. Ramakrishnan lecture series, Prof. Telang memorial lecture series and Prof. L.J. Parekh memorial lecture series. Several eminent international and national scientists have delivered lectures in these series over the years including Nobel laureates Dr. Venkatraman Ramakrishnan and Dr. Ada Yonath.

Our aim

We have primarily two aims. First is to educate and foster young minds for contributing to the society and nation economically, scientifically and socially. Our standards of teaching and training is really high and have earned a reputation nationally and internationally. Second aim is to put the department on global map as a center of excellence for modern biomedical research. Invited lectures of our faculty in international scientific meetings and distant collaborations are a testimony of our success and we are constantly looking forward to outperform ourselves in this area.

Courses Offered by the Department

The department offer two M.Sc. programmes and Ph.D. programme.

M. Sc. in Biochemistry

	THEORY SEMESTER - I	CREDITS	Course Code
PAPER I	Basic Biochemistry	03	BCH2101C01
PAPER II	Protein Structure Function & Basic Enzymology	03	BCH2102C02
PAPER III	Cell Biology	03	BCH2103C03
PAPER IV	Biophysical techniques and Biostatistics	04	BCH2104C04
PAPER V	Molecular Biology – I	03	BCH2105C05
	Practical-I	09	BCH2106C06
	Viva (Internal)	01	BCH2107C07
	Total Credits	26	
	THEORY SEMESTER - II	CREDITS	Course Code
PAPER I	Metabolism I	03	BCH2201C08
PAPER II	Advance Cell Biology	03	BCH2202C09
PAPER III	Enzyme mechanism & Regulation	03	BCH2203C10
PAPER IV	Basic Physiology	03	BCH2204C11
PAPER V	Recombinant DNA Techniques	03	BCH2205C12
	Practical-II	09	BCH2206C13
	Viva (Internal)	01	BCH2207C14
	Seminar	01	BCH2208C15

	TOTAL CREDITS	26	
	THEORY SEMESTER - III	CREDITS	Course Code
PAPER I	Basic Immunology	03	BCH2301C01
PAPER II	Metabolism-II	03	BCH2302C02
PAPER III	Molecular Biology-II	03	BCH2302C03
PAPER IV	Endocrinology	03	BCH2304C04
PAPER V	Basic Pharmacology (Optional Paper- I)	03	BCH2308C08
PAPER V	Advanced Plant Biochemistry (Optional Paper- I)	03	BCH2309C08
PAPER V	Biochemical Toxicology (Optional Paper- I)	03	BCH2310C08
	Practical-III	09	BCH2305C05
	Viva (Internal)	01	BCH236C06
	Seminar	01	BCH2307C07
	Total Credits	26	
	THEORY SEMESTER - IV	CREDITS	Course Code
PAPER I	Genetics	03	BCH2401C09
PAPER II	Genetic Engineering, Genomics and Bioinformatics	04	BCH2402C10
PAPER III	Biochemical basis of diseases (Optional - I)	03	BCH2406C14
PAPER III	Microbial Adaptive Biology (Optional - I)	03	BCH2407C14
PAPER III	Structural Biology (Optional - I)	03	BCH2408C14
PAPER IV	Neurochemistry (Optional - II)	03	BCH2409C15
PAPER IV	Nutrition & Developmental Biology (Optional - II)	03	BCH2410C15
	Practical -IV	04	BCH2403C011
	Viva (External)	01	BCH2404C012
	Project Work	06	BCH2405C013
	TOTAL CREDITS	24	

M.Sc. in Medical Biotechnology

	THEORY SEMESTER - I	CREDITS	Course Code
PAPER I	Basic Biochemistry	03	MBT2101C01
PAPER II	Protein Structure and Function & Basic Enzymology	03	MBT2102C02
PAPER III	Cell Biology	03	MBT2103C03
PAPER IV	Biophysical techniques and Biostatistics	03	MBT2104C04
PAPER V	Molecular Biology – I	03	MBT2105C05
	Practical-I	09	MBT2106C06
	Viva (Internal)	01	MBT2107C07
	Total Credits	25	
	THEORY SEMESTER - II	CREDITS	Course Code
PAPER I	Mammalian biochemistry	03	MBT2201C08
PAPER II	Advance Cell Biology	03	MBT2202C09
PAPER III	Enzyme mechanism & Regulation	03	MBT2203C10
PAPER IV	Basic Physiology	03	MBT2204C11
PAPER V	Recombinant DNA Techniques	03	MBT2205C12
	Practical-II	09	MBT2206C13
	Viva (Internal)	01	BCH2207C14
	Seminar	01	BCH2208C15
	TOTAL CREDITS	26	
	THEORY SEMESTER - III	CREDITS	Course Code
PAPER I	Infection and Immunity	03	MBT2301C01
PAPER II	Clinical Biochemistry and Ethical Aspects	03	MBT2302C02
PAPER III	Gene Expression and Modulation	03	MBT2303C03
PAPER IV	Hormone regulation and diseases	03	MBT2304C04
PAPER V	Medical Microbiology	03	MBT230C05

	Practical-III	09	MBT2306C06
	Viva (Internal)	01	MBT2307C07
	Seminar	01	MBT2308C08
	Total Credits	26	
	THEORY SEMESTER - IV	CREDITS	Course Code
PAPER I	Human Genetics, Stem Cell and Regenerative Biology	03	MBT2401C09
PAPER II	Recombinant DNA Tech. & Information Biology	04	MBT2402C10
PAPER III	Molecular Medicine	03	MBT2403C11
PAPER IV	Neurobiology and Neurological disorders (optional I)	03	MBT2407C15
PAPER IV	Medicinal Drug Discovery and design (Optional - I)	03	MBT2408C15
	Practical -IV	04	MBT2404C12
	Viva (External)	01	MBT2405C13
	Project Work	06	MBT2406C14
	Total Credits	24	

Placement Profile of Students

- Top Biotech & Pharma companies such as Sun Pharma, Dr. Reddy's Laboratories, INTAS Pharmaceuticals, Aurobindo Pharma, IPCA Labs, etc.
- Leading research Institutes across the country, such as IISc, NCBS Bangalore, TIFR, ACTREC, Mumbai, NCCS, IISER-Pune, NII Delhi, etc.
- Ph.D. or Post-doctoral positions at leading universities in abroad countries such as USA, Canada, Germany, etc.



For Further Information Please Contact:

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www.msub.digitaluniversity.ac.in

FACULTIES OF THE DEPARTMENT

Prof. C. Ratna Prabha	Professor and Head
Prof. Pushpa Robin	Professor
Prof. Rajesh Singh	Professor
Dr. Jayashree Pohnerkar	Associate Professor
Dr. Shashikant Acharya	Associate Professor
Dr. Laxmipriya Nampoothiri	Associate Professor
Dr. Devesh Suthar	Assistant Professor
Dr. Ravi Vijayvargia	Assistant Professor
Dr. Sanjeev Upadhyay	Assistant Professor (UGC-FRP)

THRUST AREAS OF RESEARCH

Department is actively involved in research in the areas of Diabetes, Metabolic syndrome, Cell death, Vitiligo, Polycystic ovarian syndrome, Obesity, Fragile X syndrome, Cancer, BPH, Hypothyroidism, Huntington's disease, miRNAs and Protein dynamics, understanding microbes for soil chemistry, plant growth, antibiotics and biofilm.

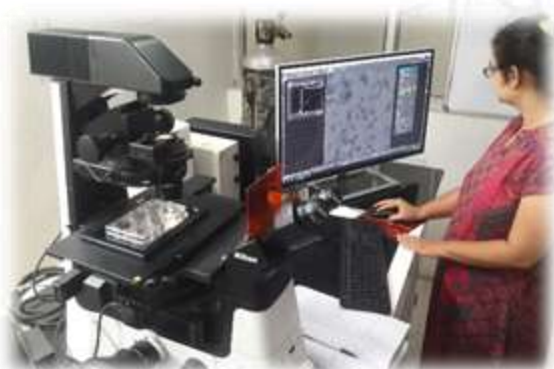


Facilities available at Department

- ❖ Seminar hall & 2 Lecture rooms equipped with LCD projectors
- ❖ Central instrumentation lab with high end equipment
- ❖ Well-equipped M. Sc. labs
- ❖ Department library facility
- ❖ Research Labs for every Faculty member
- ❖ Animal House facility
- ❖ Common area for students

Instruments available in Central Instrumentation room

- Digital Droplet PCR
- Lyophilizer
- Fluorescent Microscope
- UV-visible spectrophotometer
- Multimode Reader
- Fluorescence spectrophotometer
- HPLC
- Sonicator
- Cell culture room
- 2D-PAGE





Events and activities of the Department



ADMISSION PROCEDURE

The application form is to be filled online only. A student willing to apply for more than one MSc Program should submit separate application for each and **the application form fee in such cases will have to be paid separately for each course/program**. The students who have applied and fulfill the criteria of **minimum qualifications for eligibility** can appear in the entrance examination. **A written Entrance Test will be conducted for deciding admission to each programme. The admissions will be strictly based on the merit of marks obtained in written Entrance Test.**

INTAKE CAPACITY: **Biochemistry: 30 (GIA+HP)**
 Medical Biotechnology: 24 (HP)

ELIGIBILITY CRITERIA

The admission is based on the merit of entrance test only. To appear in **entrance test**, following **eligibility criteria** is to be fulfilled:

1. A student with B. Sc. or an equivalent degree (10+2+3/4 pattern of education) in Life Sciences/ Chemical Sciences or allied subject/ B. Pharm, B. Tech in Biotechnology from a university in any state or Union Territory of India or a global University/ Education Institution recognized by The Maharaja Sayajirao University of Baroda is eligible. The minimum marks/ grade points in qualifying examination shall be as follows:

i. For general category candidates

50% or equivalent grade points (considering all the three years).

ii. For SC/ST candidates

Must have passed qualifying examination.

iii. For SEBC candidates

45% or equivalent grade points for applicants from Gujarat and 50% or equivalent grade points for applicants from other states and Union Territories in India.

2. Candidates who have **appeared for final year of the qualifying examination** may also apply and appear in the Entrance Test. However, their admission will be confirmed only on the submitting original marksheet of the qualifying examination and fulfillment of eligibility requirement, at the time of Admission.

CRITERIA FOR CASTE-WISE RESERVATION AND OTHER QUOTA

Government of Gujarat rules for the reservation quota will be applied: SC: 7%, ST: 15%, SEBC: 27%, General: 51%. All

original certificates should be produced at the time of document verification and admission.

IF ANY RELEVANT CERTIFICATE IS NOT PRODUCED AT THE TIME OF ADMISSION, THE STUDENT WILL NOT BE CONSIDERED FOR PARTICULAR RESERVATION CATEGORY.

A student, irrespective of her/his reservation category, for admission, will be first considered for GENERAL category.

- a) The **SC and ST students of other than the Gujarat state** should produce a certificate from competent authority of Government of Gujarat if their original certificate DO NOT indicate that their caste / Tribe is recognised under such category in Gujarat also.
 - b) The **SEBC category** are required to produce a valid **non creamy layer certificate** from competent authority .
 - c) There will be **10 %** supernumerary seat (**additional seats over and above the total number of seats**) reservation of the total seats for **Economically Weaker Sections (EWS)**. Within this 10% quota, **33%** seats shall be further sub-reserved for female students belonging to the same Economically Weaker Sections.
 - d) **Reservation for physically disabled students: 5%** seats of the total seats (to be included under each different category with in the limit of total reservation under a particular reservation category like SC/ST/SEBC/GEN) are reserved for the persons with benchmark disability in accordance with the provisions of the section 32 of the rights of persons with Disabilities ACT, 2016. They should produce a **current/recent year certificate of Civil Surgeon** stating the type of disability, extent (%) of disability and state (Progressive/ non-progressive) of disability. Only those students who have **minimum 40% disability** are eligible to be considered for the reservation.
 - e) **Reservation for Defence & Ex/In- Servicemen: 1%** seats of the total seats (to be included under each different category with in the limit of total reservation under a particular reservation category like SC/ST/SEBC/GEN) are reserved for wards of Defence & Ex/In-Servicemen.
 - f) **Reservation for Kashmiri Migrants: 1% supernumerary seat reservation quota** (Additional seats, **NOT** included under each different category with in the limit of total reservation under a particular reservation category like SC/ST/SEBC/GEN).
- G) ADVANTAGE TO SPORTS PERSONS: PLEASE NOTE THAT THE BENEFIT TO SPORTS PERSONS IS GRANTED ONLY IF THE STUDENT HAS PARTICIPATED/ AWARDED MEDALS IN STATE LEVEL OR HIGHER LEVEL COMPETITIONS.**
- i. Students who participated at State level: **3%** marks to be added to their eligibility marks
 - ii. Students who won medal at State level or participated at National level: **5%** marks to be added to their eligibility marks
- Students who have won medal at National level or participated / won medal at International level: to be granted **Direct admission**.

- h) **Reservation for wards of MSU Staff: 01% supernumerary seat reservation quota** (Additional seats, **NOT** included under each different category with in the limit of total reservation under a particular reservation category like SC/ST/SEBC/GEN) **only in Regular Payment Fee Category** for the wards of the permanent or temporary employees of The Maharaja Sayajirao University of Baroda. They should produce relevant documents at the time of admission.
- i) If the **seats remain vacant** after stipulated admission rounds in the SC or ST reservation categories, then these seats can be **interchanged** among SC and ST.
- j) After granting admission to all the students of any reserve category on respective reserve seats, if the **reserved category seats remain vacant then these seats shall be transferred to General (Unreserved)category seats.**

Supernumerary seats which remain vacant shall NOT be transferred to any other category.

Admission Fees is to be paid through online mode only.

**CASH/CHEQUE OR ANY OTHER MODE OF
TRANSACTION NOT ACCEPTED**

INSTRUCTIONS TO THE CANDIDATES

1. **The admissions will be strictly based on the merit.** Just fulfilling the eligibility criteria DOES NOT GUARANTEE admission.
2. The admission to the course is PURELY TEMPORARY and subjected to various scrutiny till the unique Permanent Registration Number (PRN) of the candidate is generated.
3. **If the information provided by the candidate is incorrect or if any unfair practice is followed or the candidate is unable to submit any of the required certificates in the stipulated time period, his/ her admission is liable to cancellation.**
4. **Maintenance of Stipulated Attendance of Students (Ordinance 183)** The following shall be the minimum attendance necessary:
 - a. In a semester an overall attendance of **at least 75%** of the number of lectures delivered and tutorials, seminars etc. arranged in all subjects, provided the total attendance in each of the subjects offered is **at least 60%**.
 - b. In a semester an overall attendance of **at least 80%** of the days allotted for practical classes and laboratory work in each subject.
5. General rules governing the conduct of students in the university:
 - i. A student must do nothing either inside or outside the University that will interfere with its orderly working and discipline.
 - ii. This comprehensive rule covers most cases that are likely to arise. It forbids:
 - a. Impolite or unseemly behaviour in classroom or University premises during working hours of the College and the Faculty.
 - b. Attempt to persuade other students to abstain themselves from regular classes.
 - c. Damage to or defacement of University furniture, fittings and property.
 - d. Disobedience of notifications or instructions issued by the Principals/Deans/Heads of the Departments and Members of the staff duly authorized.
 - iii. As per UGC regulation, stipulated attendance (Ordinance 183) is required for permitting students to appear for final examination. If unavoidably absent on account of health, urgent private affairs or other reasons, they must be prepared to state the exact reason for absence.
 - iv. Students are expected to behave with courtesy towards the members of the staff, their fellow students and all visitors to the Institution.

- v. Sexual harassment will lead to severe punishments like suspension, rustication from the University / College/ Institution. Disciplinary action is as prescribed under The M. S. University of Baroda rules.
- vi. Ragging is prohibited on MSU Campus, ragging is a criminal offence and is liable to severe punishment, including suspension, rustication and imprisonment.
- vii. **Compulsory Thalassemia Blood Screening:** Thalassemia blood testing is made compulsory by Government of Gujarat. Final Eligibility of any student for admission to any course to this University will be granted ONLY after she/ he submits report of the Thalassemia blood screening. Students are encouraged to get the test done and submit the report at the time of Admission. Those students who already have a Thalassemia Test Report done earlier, need not get it done again. They can submit copy of earlier report.

GRADE POINT SYSTEM

- A system comprising of 7 grade points (4 to 10) will be followed for evaluating a candidate in every course. Both mid-semester and end-semester exams are counted for final grade points.

Grade Points	Description	Percentage of Marks	Division/ Grade	Range
10	Outstanding	90% - 99%	First / O	Above 9.01
9	Excellent	80% - 89%	First / A	8.01 – 9.00
8	Very Good	70% - 79%	First / B	7.01 – 8.00
7	Good	60% - 69%	First / C	6.01 – 7.00
6	Fair	50% - 59%	Second /D	5.01 – 6.00
5	Average	40% - 49%	Pass / E	4.01 – 5.00
4 – 0	Dropped	Below 40%	F	Below 4.00

CGPA	Class
CGPA < 4	Fail
4 = CGPA < 5	Pass Class
5 = CGPA < 6	2nd Class
6 = CGPA < 7	1st Class
CGPA ≥ 7	Distinction

$$\text{Grade Point Average} = \frac{\sum (\text{Credit X Grade Point})}{\text{Total Credits}}$$

AWARD OF CLASS

Marks-sheets of semester I to III of M. Sc. will simply indicate result as either Pass or Fail or ATKT but not the class which will be indicated in the last Semester mark sheet.

Cumulative Grade Point Average (CGPA) is computed as:

$$\text{CGPA} = \frac{\sum (\text{Semester credits X GPA})}{\text{Total Semester Credits}}$$

The sum is taken over from Sem-I to Sem-IV for M. Sc.

CRITERION FOR M.SC. DEGREE AWARD

For obtaining M.Sc. degree in any subject, a candidate has to earn minimum 100 credits in allduring the programme.

Website: www.msubaroda.ac.in

The M. S. University of Baroda Admission Portal:
admission@msubaroda.ac.in

The information contained herein is for general guidelines only.

For further information contact Faculty Administration:

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Ms. Bharati M Pamnani: CBCS Coordinator
E-mail: cbscoordinator-science@msubaroda.ac.in

Office Superintendent: Mr. K M Damor
Ph: 0265 2795329 (office)
Mob: 8141332160 (during office hours only)



“The full-blown lotus growing out of the lake symbolises the emergence of the mind and its triumph over matter. The flame rising from the center of the lotus is the flame of the human knowledge, spreading light and learning for the coming generations. The motto inscribed below the lotus defines the purpose and existence of life which is love of beauty, goodness and intellectual curiosity.”

महाराजा सयाजीराव विश्वविद्यालय गीत

अमे वडोदराना विद्यापीठना सपना सारवनारा
अमे ज्योत जलावी सृष्टी नवली सहसा सर्जनहारा.

अमे गगमकुसुम कर धरनारा
अमे मगन मगन थई फरनारा
अगन बाथ अमे भरनारा
अमे दैन्यतिमिरने हरनारा.

श्री सयाजी विद्यापीठना ज्ञानदीपने धरनारा
सत्यं शिवं सुन्दरम् नो मंत्र अनंतर भणनारा.

सयाजीराव