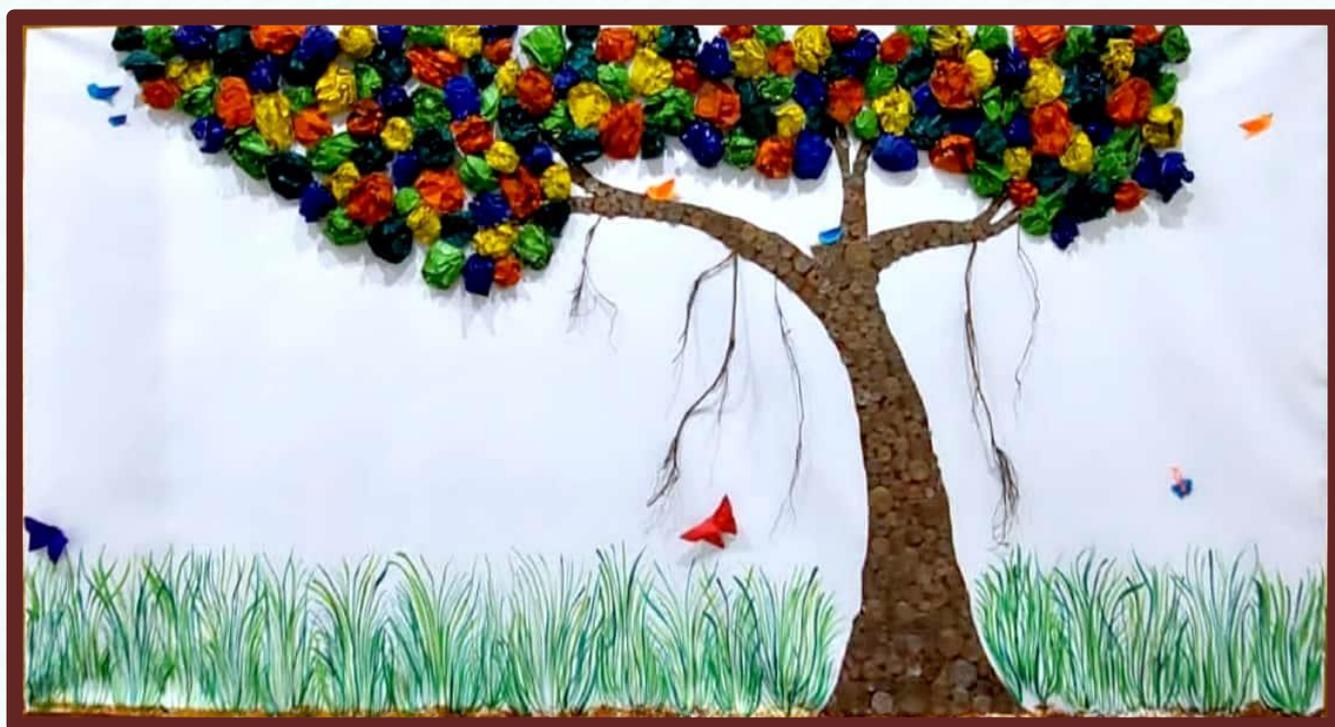


DEPARTMENT OF ENVIRONMENTAL STUDIES



M.Sc. Environmental Science 2023-24

**FACULTY OF SCIENCE
THE MAHARAJA SAYAJIRAO UNIVERSITY OF
BARODA**

(Accredited with "A+" Grade by NAAC)

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 if they are not educated.”

THE DEPARTMENT OF ENVIRONMENTAL STUDIES

VISION

The Department of Environmental Studies as a center of excellence, with expertise and facilities to disseminate quality education, perform need based research and provide solutions for mitigating local, regional, national, and global environmental issues.

MISSION

The Department is Committed

- To provide a platform for quality education as well as research and outreach activity in different areas of environmental science focusing on compassion, innovative ideas and skills towards protecting and improving the environment
- To empower students to be good stewards of the environment

From the desk of Head of the Department



Passionate about protecting the environment and preserving the planet?
The Department of Environmental Studies is the right place to nurture and ignite your passion.

The Department offers Bachelors', Masters' and Doctoral programmes in Environmental Science. The curriculum lays strong foundation on different aspects of basic sciences such as Physics, Chemistry, Biology, Ecology, Geography, Zoology, Mineralogy, Hydrology, Soil Science, Geology, mathematics, statistics and computer science that facilitates understanding the nature of the environment, its problems and solutions. Further emphasis is laid on Environmental Chemistry, Ecology, Biodiversity, Conservation, Climate Change, Renewable Energy, Environmental Biotechnology and Microbiology, Environmental Impact Assessment and management, Environmental laws and policies. Our students turn knowledge into action. The Environmental Science program encompasses strong field and laboratory components that enhance classroom-learning experiences.

Place matters. The location of Department of Environmental Studies, close to Bhukhi Kaans, the tributary of Vishwamitri river, and Sayajibaug with a rich history of wildlife heritage and huge diversity of plant species providing access to a wide variety of environmental settings and ample experiential learning opportunities to the students. The students are also given the necessary industrial exposure in terms of industrial visits and opportunities to work on industrial problems.

The department has a dedicated team of teachers with expertise in different branches of environmental science who believe in imparting knowledge to build values, attitudes and skills. Armed with the necessary professional and technical skills the students of the department find employment in different environmental fields and opportunities for research, establishing start-ups and community work.

We welcome you to the Department of Environmental Studies to realize your dreams and embark on the journey towards a sustainable environment.

Department Profile

The Department of Environmental Studies began its glorious existence under *UGC Innovative Program* as a self-finance program of B.Sc. (Hons) Environment Science in the year 2000 and later introduced M.Sc. (2010) and Ph.D. (2016) programs. The Department is celebrating its 23rd year of existence with successful accomplishments of educational and societal commitments.

The curricula of the department are truly multidisciplinary in nature encompassing Botany, Zoology, Chemistry, Physics, Microbiology, Geology, Geography subjects. The Doctoral programme is interdisciplinary in nature involving mentors from Chemistry, Botany, Zoology, Statistics, Maths and Civil Engineering departments

The Department also offers Environmental Studies as a subject integrated into other programmes offered by the university and other institutes :

1. **Foundation course** to B.Sc. (Hons), BCA programmes
2. Environmental Science, Disaster Management, Field Biology, Renewable Energy resources to M.Sc. in Cell and Molecular Biology:
3. **Green Environment** course for UG students and **Environmental Science and Disaster Management** course for Master students of Faculty of Commerce.
4. **IGNOU B.Sc. and PGD** programme in Occupational health and safety)
5. **Gujarat Forest Rangers College** (Trainee ACF/RFO)

The Department has 04 Assistant Professors (CES), 05 Temp. Assistant Professors and 10 support staff with a student to teacher ratio of about 30:1

The Department holds expert lectures where renowned academicians, researchers and grass root workers in the field of environmental science are invited to deliver lectures and interact with the students.

Courses Offered

Master of Science in Environmental Science

Seats available: 44

Eligibility: Graduates of all branches of science and technology are eligible.

Other Courses Offered:

Ph. D. in Environmental Science

Eligibility: M.Sc. in any branch of Science and Technology. Should have passed MSU PET/UGC NET/GATE

Bachelor of Science (Hons) in Environmental Science

**Eligibility: Passed H.S.C. (10+2) / an equivalent exam from Science stream with English as one of the subjects.
Admission through Entrance Test conducted by University.**

Syllabus: M.Sc. in Environmental Science

Effective from Academic Year 2020-21

Course Title	Credits
SEMESTER-1	
Research Methodology and Instrumentation	4
Toxicology and Hazardous Waste	4
Ecology	4
Environmental Resources and Sustainable Development	4
Practical I - Biostatistics, Computer Applications and Instrumentation training	3
Practical II - Toxicology and Waste Analysis	3
Practical III - Ecology	3
Field Visit (to Environmental Pollution, Waste Disposal and Treatment Sites)	2
Seminar (on Current Environmental Challenges and Technology Advances)	1
Total Credits	28
SEMESTER-2	
Nanotechnology, Plasma Science and Biotechnology	4
Ecological Assessment and Conservation	4
Air and Noise Pollution Monitoring and Management	4
Water and Soil Pollution Monitoring and Management	4
Practical IV - Nanotechnology and Biotechnology	3
Practical V - Analysis of Pollution Indicators	3
Practical VI - Ecological Assessment and Conservation	3
Field Visit (to Biodiversity and Conservation sites, to pollution impacted sites)	2
Seminar presentation on a research article	1
Total Credits	28
SEMESTER-3	
Remote Sensing and GIS Applications	4
Impact Assessment, Auditing and Environmental Economics	4
Industrial Safety, Risk Assessment and Disaster Management	4
Environmental Applications and Environmental Legislation	4
Practical VII - RS and GIS	3
Practical VIII - EIA Case Studies, Awareness and Socio-Economic Studies	3
Practical IX - Industrial Safety, Environ Monitoring and Modelling	3
Industrial/Institutional Visit	1
Seminar on Dissertation Proposal	2
Total Credits	28
SEMESTER-4	
Pre Dissertation Seminar on Experimental Design and Methodology	2
Dissertation Submission Assessment	4
Dissertation Presentation Assessment	6
Comprehensive Viva Voce	4
Total Credits	16

Industrial Training and Dissertation

Students visit industries to acquaint themselves with environment related issues. In final Semester, the students are deputed to an industrial unit/environment related organization for practical training. Many students carry out their Dissertation in the industries. Some of the organizations where practical training is being conducted include the following:

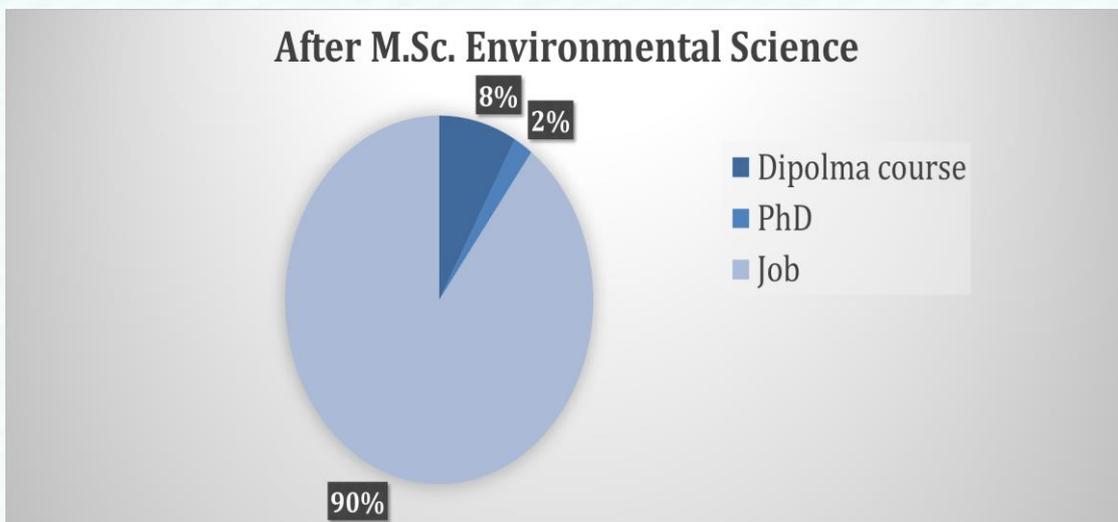
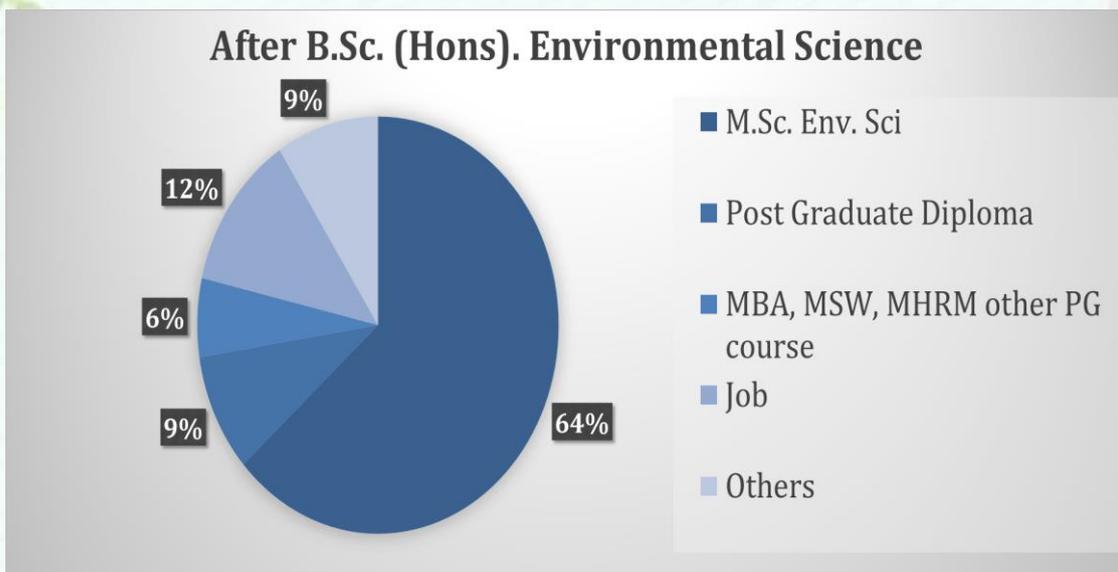
Association with Industries/Organizations



Dissertation Thrust Areas

- Removal of pollutants using chemical and biological approaches, Enzyme technology, Eco-centric and low-cost water treatment.
- Disaster Risk Assessment and Mitigation, Biodiversity mapping and Coastal Ecology.
- Remote Sensing, Groundwater Monitoring & Assessment and Hydro-geochemistry.
- Carbon Sequestration and Constructed Wetlands.
- Bioremediation and Biodegradation.
- Climate change mitigation and enhancing livelihood option.

Students progression



Career progression, scope and placements

Career Options: EHS departments of industries, environmental consultant, Environmental auditor viz., energy audit, water audit etc., Research institute as research fellow/ scientist, teaching school, colleges etc.

Academic Options: Masters and PhD in Environmental science, Social work, Business administration, biotechnology and allied field. B.Ed, M.Ed, LLB, LLM. PG diploma courses in disaster management, climate change, resource management etc.

Placements: Major recruiters for our students include CEE, Ahmedabad; GPCB, Kadam consultants, Green Circle, Paramount consultants, Parul university, GEER foundation, Gandhinagar etc.

Ongoing Research Projects

- Vadodara Municipal Corporation Sponsored Project worth Rs 8,23,000 entitled “Limnological Survey of Ajwa Reservoir with respect to Agricultural runoff
- GSBTM Sponsored Project worth Rs. 46,00,712 entitled Polyhydroxyalkanoate/chitosan/magnetite composite- Synthesis, Characterization and potential Applications

Major Areas of Research

Climate Change and Mitigation

Environmental Monitoring

Environmental Biotechnology

Environmental Modelling

Environmental Impact & Risk

Assessment

Water and Waste Water Technologies

Waste management

Disaster Mitigation

Environmental Materials

Environmental Fluid Mechanics

Environmental Statistics

DEPARTMENTAL FACILITIES

Infrastructure

Sr. No	Facilities	Salient Features
1	Classrooms	Equipped with audio-visual presentation facilities
2	Research labs(2)	UV-Visible Spectrophotometer, AAS, BOD incubator cum shaker etc.
3	UG and PG laboratories(3)	For physical, chemical as well as biological analysis and monitoring.
4	Computer Laboratory	More than 25 high end computer systems with installed GIS software
5	Department Library	Harbouring more than 600 books and journals of environmental studies

Instrumental facilities



Atomic Absorption Spectrophotometer (PerkinElmer: PinAAcle 500)



BOD incubator cum shaker



UV- Visible Spectrophotometer (Agilent Technologies; Carry 60)



Refrigerated centrifuge



Flame-photometer



Respirable dust sampler



Gaseous pollutant sampler

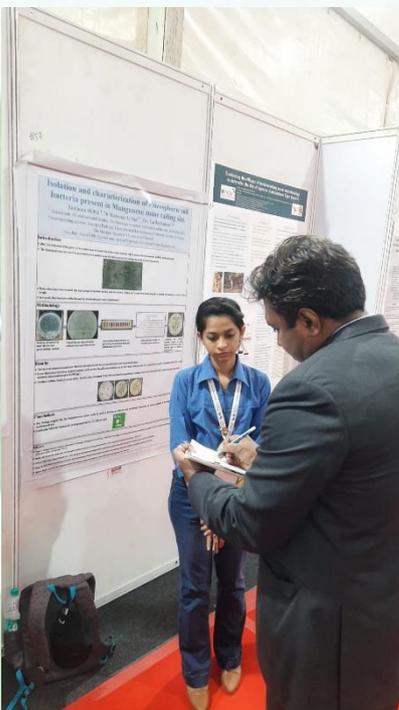
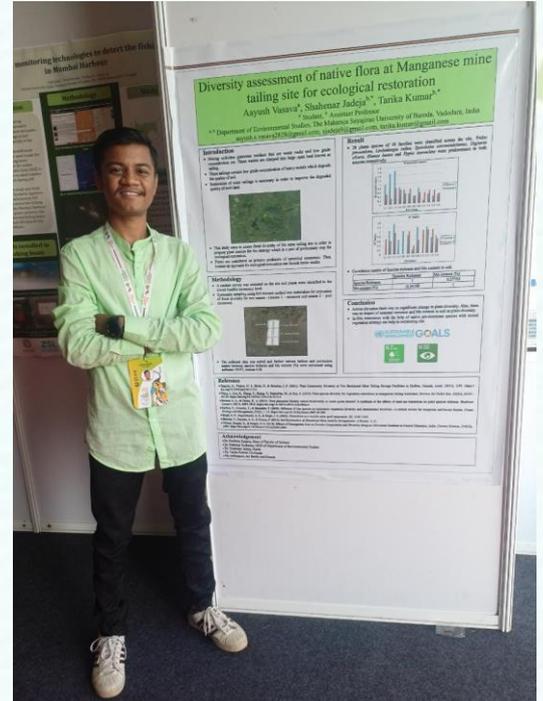


Microscopic system fitted with microscopic camera (CC130: CatCam 130; 1.3 MP)

Pledge to save Environment



Student's Participation in Conferences/Events



Student's Outdoor Learning



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Departmental Fest



ADMISSION PROCEDURE

The application form is to be filled online only.

The students who have applied and fulfil the criteria of minimum qualifications for eligibility can appear in entrance examination.

A written Entrance Test will be conducted for deciding admission to the programme. The admissions will be strictly based on the merit of marks obtained in written Entrance Test.

INTAKE CAPACITY 44 Seats

ELIGIBILITY CRITERIA

To appear in entrance test, following eligibility criteria is to be fulfilled:

A student with B.Sc. or an equivalent degree (10+2+3 pattern of education) in the relevant subject 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.

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 mark sheet 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 shall be applicable: **SC: 7%, ST: 15%, SEBC: 27%, General: 51%**.

All original certificates should be produced for verification at the time of 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 as per the marks secured.

a). The certificates of **SC and ST students of other than the Gujarat state** should be issued from the competent authorities of their state/UT and suggesting that their caste / Tribe are recognised nationally under such category.

b). The applicants of **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**
- iii. 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.

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.

After granting admission to all the students of any reserve category on respective reserve seats, if the reserved category seats remain vacant then these 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 IS NOT ACCEPTED

INSTRUCTIONS TO THE CANDIDATES

- Admissions will be strictly based on the merit. Just fulfilling the eligibility criteria DOES NOT GUARANTEE admission. The admission to the course is PURELY TEMPORARY and subjected to various scrutiny till the unique Permanent Registration Number (PRN) is generated.
- 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.
- Ragging is prohibited on MSU Campus, ragging is a criminal offence and is liable to severe punishment, including suspension, rustication and imprisonment.
- **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.
- 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.

Maintenance of Stipulated Attendance of Students (Ordinance 183)

The following shall be the minimum attendance necessary

- i. 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%.
- ii. In a semester an overall attendance of at least 80% of the days allotted for practical classes and laboratory work in each subject.

General rules governing the conduct of students in the university

- A student must do nothing either inside or outside the University that will interfere with its orderly working and discipline.
- This comprehensive rule covers most cases that are likely to arise. It forbids:
 - i. Impolite or unseemly behaviour in classroom or University premises during working hours of the College and the Faculty.
 - ii. Attempt to persuade other students to abstain themselves from regular classes.
 - iii. Damage to or defacement of University furniture, fittings and property.
 - iv. Disobedience of notifications or instructions issued by the Principals/Deans/Heads of the Departments and Members of the staff duly authorized.
- 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.
- Students are expected to behave with courtesy towards the members of the staff, their fellow students and all visitors to the Institution.

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	CGPA	Class
9	Excellent	80% - 89%	First / A	8.01 - 9.00	CGPA < 4	Fail
8	Very Good	70% - 79%	First / B	7.01 - 8.00	4 = CGPA < 5	Pass Class
7	Good	60% - 69%	First / C	6.01 - 7.00	5 = CGPA < 6	2nd Class
6	Fair	50% - 59%	Second / D	5.01 - 6.00	6 = CGPA < 7	1st Class
5	Average	40% - 49%	Pass / E	4.01 - 5.00	CGPA ≥ 7	Distinction
4 - 0	Dropped	Below 40%	F	Below 4.00		

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

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:

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

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

CRITERION FOR B.Sc. DEGREE AWARD

For obtaining M.Sc. degree, a candidate has to earn minimum 100 credits during the programme.

M.Sc. ADMISSIONS AND ENTRANCE TEST 2023-24 (Offline Mode)

- **Candidate who has passed B.Sc. in 10+2+3 pattern, or equivalent examination, in any branch of science and technology are eligible.**
- **Candidates who have passed their qualifying exam in April/May 2021 or 2022 are also eligible to appear for the Entrance Test.**
- **Student who has appeared in qualifying examination can file online application and can appear in entrance test. Admissions are granted on the basis of merit list of marks obtained in entrance test, however, for final admissions; student should have minimum eligibility at qualifying exam.**

Total 50 Multiple Choice Questions (100 marks) with one correct answer will comprise the test paper. The syllabus of B.Sc. in Environment Science is considered as the basis for the Entrance Test

Further details at Written Test Syllabus URL: [View Written Test Syllabus](#)
Keep visiting the website <https://admission.msubaroda.ac.in> for updates regarding date of examination and other details.

Following the Entrance Test, the question paper, answer key and candidate-wise mark sheet will be uploaded on University website

The Merit/ Provisionally Admitted Student's List will be declared separately, reservation category-wise, on the website

Some important contacts for details of the department

- **Prof. P. Padmaja (09376214733)**
- **Dr. Bablu Prasad (07435909032)**
- **Dr. Manthan Tailor (09016509653)**
- **Dr. Tarika Kumar (07846833999)**
- **Dr. Neha Singh (09409265400)**

**The Maharaja Sayajirao University of Baroda Website:
www.msubaroda.ac.in**

**The Maharaja Sayajirao University of Baroda Admission Portal:
admission@msubaroda.ac.in**

**The information contained herein is for general guidelines only.
For further information contact Faculty Administration:**

**DEAN: PROF. H R KATARIA
Email: dean-science@msubaroda.ac.in**

**Students' Coordinator: Prof. M N Srinivas
Email: deanstudents-science@msubaroda.ac.in**

**Sports Coordinator: Ms. Shilpa Gupta
Email: deansports-science@msubaroda.ac.in**

**Teacher Supervisors: Dr. Rupal Shah, Dr. Hetal Roy
Email: ts1-science@msubaroda.ac.in**

**Coordinator at Sir C V Raman Building: Dr. R. N. Jadeja
Email: unitcoordinator-science@msubaroda.ac.in**

**CBCS Coordinator: Ms. Bharati M Pamnani
Email: cbcscordinator-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 centre 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