

# DEPARTMENT OF CHEMISTRY

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## FACULTY OF SCIENCE

M. Sc. in Chemistry

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*



## DEPARTMENT OF CHEMISTRY



### a. Message by HoD



**Prof. A.V. Bedekar**

Offg. HEAD

[head-chem@msubaroda.ac.in](mailto:head-chem@msubaroda.ac.in)

Department of Chemistry is one of the biggest departments in the faculty having 12 Professors, 7 Associate professors and 3 Assistant professors with expertise in various frontier area of chemistry starting from materials including nano and its different applications. Presently Department is recognized as DST FIST Level II by DST. Our faculties are getting financial support by individual research projects from various national funding agencies such as CSIR, DST, DBT, UGC, UGC-DAE, BRNS and GUJCOST, amounting more than 5 crore in last 10 years. In addition to this, department also gets financial support in form of either research fellowships or donation from industries such as Solvay, Rubamin, Alembic, Sudeep Pharma and Diamines. We have more than 900 members of the Alumni Association of Chemistry Department (AACD), some of the members provide funding for research and infrastructure

development. Vision of department is to create quality educated students with basic understanding of chemistry and allied subjects. To integrate academic knowledge with practical, research and industry inputs to help students realize their optimum potential. We are providing a learning environment that nurtures critical reflections, exchange of ideas and innovation amongst students. In order to develop the scientific temperament, various activities like open house, quizzes, industrial visit, and department chemical society meet, conducted on the regular basis. The department is proud to state that the postgraduate students get proper placements and several students desirous of pursuing research and clear national exams such as NET, GATE and GSLET. Our students were placed in IIT, IISER, IISc and other national laboratories.



Open House 2020

### Introduction to the department

The Department of Chemistry was established in 1949 along with the university. Prior to that it was a part of the Baroda College affiliated to Mumbai University, during pre-independence period. The rise of the department to the UGC's Centre for Advanced Studies in Chemistry shows the progression the Department has achieved, thanks to the dedicated and pioneering efforts made by the teachers.

From the beginning, the department has strived for excellence both in teaching and research. Department offers 3 year B.Sc. Honors course in Chemistry, 2 year M.Sc. course with 4 specializations Organic, Inorganic, Physical & Polymer and Analytical chemistry as well as a PhD program in Chemistry. The students are well trained in practical and are well placed in various industries through campus placements.

For last more than 50 years, scientific research in the department is not merely consistent but getting evolved every year. UGC bestowed DRS and DSA UGC programmes, to present day "Centre of Advanced Studies in Chemistry" (CAS-II). The Department is presently covered under the FIST programme (Level II) of DST. Gujarat Council of Science and Technology (GUJCOST) had recognized the department as "Centre for Excellence in Material Science and Nanopolymeric Materials". The research output by the department also helped University to bag DST-PURSE Program.

Modernization of laboratories and classrooms has been carried out through financial support from industries and significant infrastructure grant from UGC. In addition to central library facilities of University, the department has its own library of reference books, dissertation reports and PhD theses available for ready reference to the students and staff members. The Department has definitely made its mark both at national and global level in its teaching and research activities, as reflected in the invitations received by faculty members for giving lectures, chairing sessions in conferences at National and international level as well as for writing reviews and authoring and editing books.





### C. Details of courses

Program:	Master of Science
Details:	M.Sc. is the post graduate degree programme offered in five specializations Inorganic Chemistry, Organic Chemistry, Physical & Polymer Chemistry, Analytical and Industrial & sustainable Chemistry. The programme duration is Two years (Four semester) and comprises of 100 credits. Each year is divided into two semesters
Program level:	<b>Post Graduate</b>
Program nature:	<b>Degree</b>
Intake capacity:	<b>Total : 110</b>
Duration of Program:	<b>2 years (4 Semesters)</b>
Mode of Programme	<b>Full time</b>
Subjects offered:	<b>Inorganic Chemistry, Organic Chemistry, Physical &amp; Polymer Chemistry, Analytical and Industrial &amp; sustainable Chemistry</b>

The first two semesters are common for all five branches where in basic as well as advanced aspects of chemistry are covered through lectures and experimental techniques. During this period they are trained to give presentation on recent topics of research in the form of open seminars.

In the next year, in-depth knowledge in five specialized branches of chemistry is delivered. The syllabus is designed to prepare the candidates to meet the ever-changing challenges of the industries and academia. In the final year the students are required to work on a research project in the form of dissertation. The knowledge acquired in the Master's programme is evaluated by a team of internal and external examiners.



#### d. Faculty Members

##### Professors

Prof. (Ms.) Neelima D. Kulkarni  
Prof. (Mrs.) Anjali Patel  
Prof. (Mrs.) Padmaja Sudhakar  
Prof. Ashutosh Bedekar  
Prof. Prasanna Ghalsasi  
Prof. (Mrs.) Bhavna Trivedi  
Prof. Ashish K. Prajapati  
Prof. (Mrs.) Shubhangi S. Soman  
Prof. Prakash B. Samnani  
Prof. (Mrs.) Debjani Chakraborty  
Prof. Sujit Baran Kumar

##### Associate Professors

Dr. Rajendrasinh Jadeja  
Dr. Vinaykumar Singh  
Dr. Amar Ballabh  
Dr. Hemant P. Soni  
Dr. Arunkumar Patel  
Dr. (Mrs.) Sonal I. Thakore  
Dr. A.A. Ajmeri

##### Assistant Professors

Dr. (Ms.) Arpita S. Desai  
Dr. Divyesh K. Patel  
Mr. Kiran J. Nakum

#### e. STAFF ACHIEVEMENTS

##### Awards & Recognition:

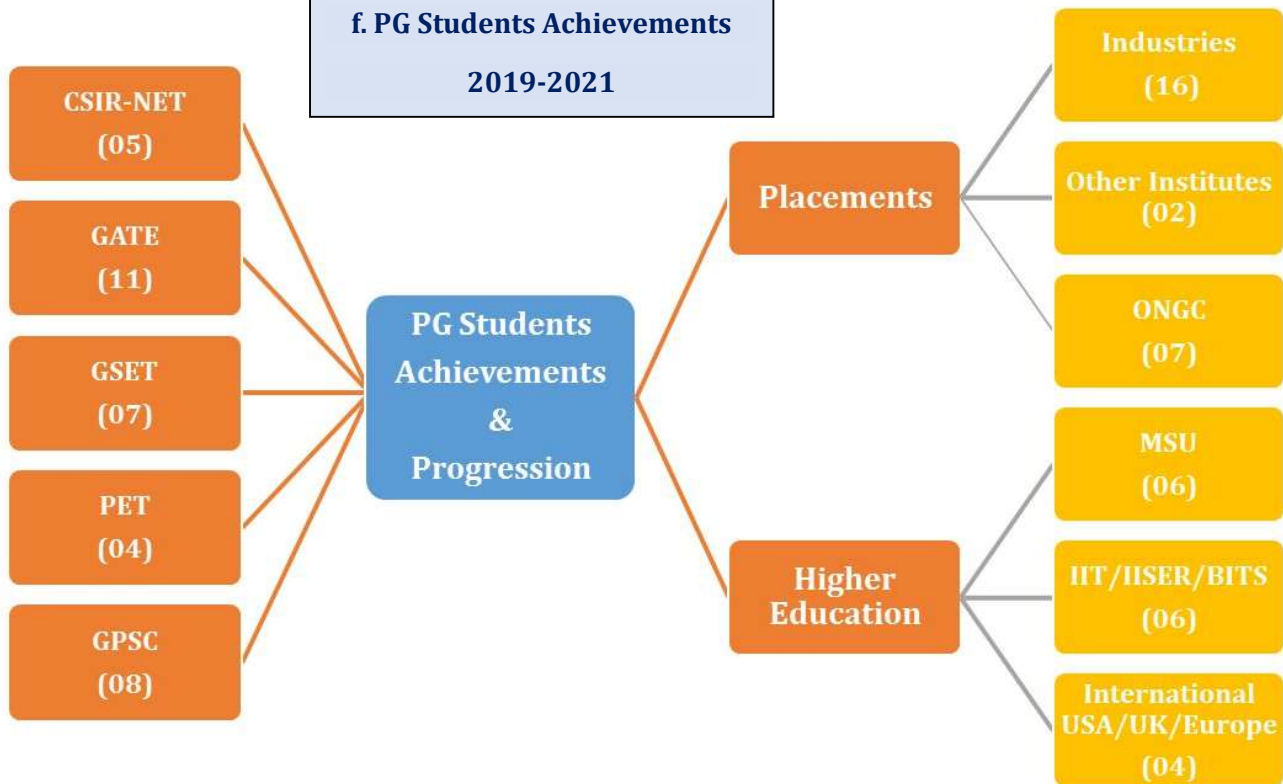
- ❖ Prof. Anjali Patel has been selected as a Fellow by Royal Society of Chemistry in the year 2019.
- ❖ Prof. Ashutosh Bedekar has been awarded Bronze Medal for research in the field of synthesis of helical compound by Chemical Research Society of India, IISc, Bangalore India for the year 2019 (date of award 21.07.2019)
- ❖ Prof. Ashutosh Bedekar has been selected as a Member of National Academy of Sciences, India under the category of Physical Sciences in May 2019.
- ❖ Dr. Rajendrasinh N. Jadeja has been elected as Council Member (2020-22) of Indian Chemical Society Kolkata.

##### Patents

- ❖ 'A method of Catalysis for preparing Coupled Product of Aromatic Hydrocarbons'  
Patent No. 333913, 16.02.2016 (SL No. 022107994)  
Prof. Prasanna Ghalsasi
- ❖ 'Microscopic cavity to macroscopic surface for asymmetric syntheses'  
Patent No. 362870, 03/11/2017 (SL No. 022107994)  
Prof. Prasanna Ghalsasi
- ❖ A novel class of supramolecular compounds compound of formula (IA) and formula (IB)  
Patent No. 369055, 07.01.2020  
Dr. Arpita Desai and Ms. Priyanka Mathur



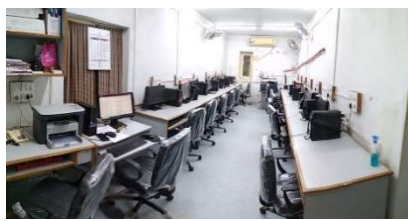
**f. PG Students Achievements  
2019-2021**



**g. Infrastructure facilities**



Lecture room



Computer room



Library



Laboratory



Seminar room



Common room



## PG Students Achievements



IYPT 2019



OPEN HOUSE 2020



SCIENCE FAIR 2020



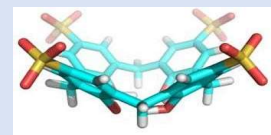
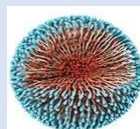
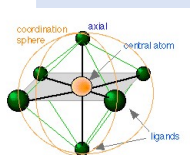
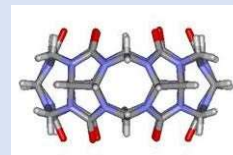
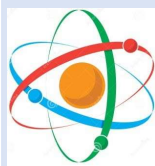




### h. THRUST AREAS OF RESEARCH

Staff members of our department have been actively engaged in following Research areas:

- ❖ Asymmetric Synthesis
- ❖ Bioinorganic Chemistry
  - ❖ Catalysis
  - ❖ Chemosensors
- ❖ Coordination Chemistry
  - ❖ Drug Delivery
- ❖ Environmental Chemistry
  - ❖ Green Chemistry
  - ❖ Liquid Crystal
- ❖ Material Chemistry
- ❖ Medicinal Chemistry
  - ❖ Nanoscience
- ❖ Organometallic Chemistry
- ❖ Supramolecular Chemistry
- ❖ Synthetic Organic Chemistry



### SOPHISTICATED ANALYTICAL INSTRUMENT FACILITIES

- ❖ Atomic Absorption Spectrometer (AAS)
- ❖ BET Surface Area Analyzer,
- ❖ Gas Chromatograph-Mass spectrometer (GC-MS)
- ❖ Differential Scanning Calorimeter (DSC)
- ❖ Thermogravimetric analyzer (DTA-TGA)
- ❖ Digital Refractometer
- ❖ DLS Particle Size Analyzer
- ❖ FT-IR Spectrometer
- ❖ Fluorescence Spectrofluorimeter
- ❖ UV-VIS Spectrophotometer
- ❖ High Pressure liquid chromatography system
- ❖ Nuclear Magnetic Resonance Spectrometer-NMR(400MHz)
- ❖ Polarizing Optical Microscope with Hot stage (POM)
- ❖ Digital Polarimeter



AAS



BET



GC-MS



NMR  
400 MHz



POM



DTA-TGA



Spectrofluorimeter





**i. Prominent Alumni of Department**



**Sri C K Shah**  
Member  
MSU Alumni Foundation  
Inc, USA



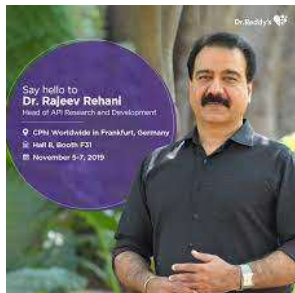
**Dr Rakesh Kohli**  
Ex-Director,  
Mass-spectrometry  
Facility,  
University of  
Pennsylvania



**Prof K Seshan**  
Retd. Professor  
University of Twente,  
Netherlands



**DR. J. S. Yadav**  
Former Director,  
IICT- Hyderabad  
Director, Indrashil  
University, Ahmeadabad



**Dr Rajeev Rehani**  
Executive Vice President  
and Head, API,  
Dr Reddy's Laboratories  
Ltd



**Dr Hasit Dangi**  
Vice President - Operations  
Product and Application  
Development, National  
Peroxide Limited



**Dr V B Mohan Kumar**  
Director,  
Wimpey Laboratories,  
Abu Dhabi



**Dr. Mathew Jacob**  
Manager  
Clariant International Ltd,  
Basel, Switzerland



**Dr. Paresh Sanghvi**  
Global Technical Manager,  
Deltech Europe Ltd.  
UK



**Dr. Jigar Desai**  
Deputy General Manager  
Zydus Research Centre,  
Ahmeadabad



**Dr. G Kalpana**  
Ex. Vice President  
Reliance Industries Ltd.  
Vadodara



**Dr. Bharat Newalkar**  
General Manager  
R & D  
Bharat Petroleum  
Corporation Ltd.

## 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: 110 SEATS**

## 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 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. 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.
3. The candidate should have taken at least 60 credits in chemistry subject including practical. Students should have studied Chemistry for minimum 33% (Inorganic, Organic, Physical and Analytical Chemistry) at B Sc level.
4. Where only grade is available in qualifying exams, a certificate from their University specifying equivalent percentage marks will be required.

### *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

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

#### 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:

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

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](http://www.msubaroda.ac.in)**

**The M. S. University of Baroda Admission Portal:  
[admission@msubaroda.ac.in](mailto:admission@msubaroda.ac.in)**

The information contained herein is for general guidelines only.

For further information contact Faculty Administration:

**Prof. Haribhai Kataria**  
Dean, Faculty of Science  
E-mail: [dean-science@msubaroda.ac.in](mailto:dean-science@msubaroda.ac.in)

**Dr. R N Jadeja: Dean of Students**  
E-mail: [deanstudents-science@msubaroda.ac.in](mailto:deanstudents-science@msubaroda.ac.in)

**Ms. Shilpa Gupta: Dean of Sports**  
E-mail: [deansports-science@msubaroda.ac.in](mailto:deansports-science@msubaroda.ac.in)

**Dr. Rupal Shah, Dr. Dharmendra Shah: Teacher Supervisors**  
E-mail: [ts-science@msubaroda.ac.in](mailto:ts-science@msubaroda.ac.in)

**Dr. M N Srinivas: Coordinator, Sir C V Raman Block**  
E-mail: [unitcoordinator-science@msubaroda.ac.in](mailto:unitcoordinator-science@msubaroda.ac.in)

**Ms. Bharati M Pamnani: CBCS Coordinator**  
E-mail: [cbcscordinator-science@msubaroda.ac.in](mailto: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 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.

सयाजी विद्यापीठ