

The Maharaja Sayajirao University of Baroda



Applied Chemistry Department



Prospectus 2023-24



**Faculty of Technology and Engineering,
The Maharaja Sayajirao University of Baroda,
Vadodara-390001 (Gujarat) INDIA**



About the Applied Chemistry Department

In 1957, Chemistry was added as a subject in Engineering Programs. To meet this requirement, teachers were appointed for Chemistry subject into three semesters of Civil, Mechanical and Electrical Engineering branches. They were academically part of Chemistry Department, Faculty of Science and administratively part of Textile Chemistry Department, Faculty of Technology & Engineering. In 1962, Dr. A. M. Talati and Dr. J. M. Lohar went to USA for postdoctoral research. In 1967, during the tenure of Dr. J. S. Dave (Pioneer of Liquid Crystals studies in India), a proposal for constructing a separate Science Block was put up considering the importance of Applied Sciences in engineering education. The Department of Applied Chemistry moved to the New Science block building and established in 1975 with full status.

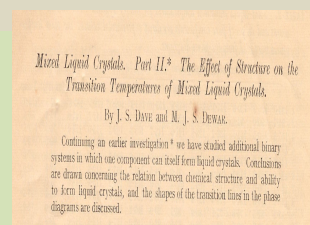
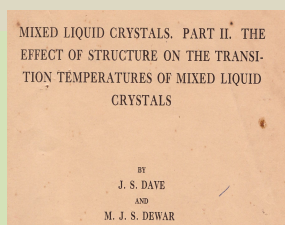
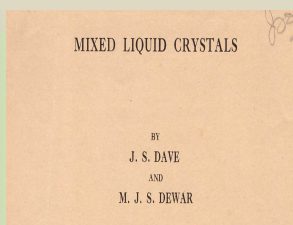
Vision : To establish the department as a Center of Excellence in Chemical Education and Research and to be recognized for its innovation, discovery and to attract the best students and groom them with intellectual and professional skill.

Mission :

- Catering to the needs of chemical industries
- Collaboration with institutions, universities and industries of international repute
- Fostering innovation through sustainable development to facilitate creation and commercialization of Intellectual Property

Founder Head : (Late) Prof. Jatashankar S. Dave

- ✓ Pioneer in the field of research on Liquid Crystalline Materials
- ✓ First to start Liquid Crystal Research in India



Late Prof. J. S.

- M. Sc. course is a unique blend of various industrially important subjects
- A full paper introduced on “Industrial Pollution” 1st time in India way back in 1978
- Industrial visits, Seminars & Dissertation projects as integral part of M.Sc. Courses.

Programme Offered by Applied Chemistry Deptt.

Master of Science in Applied Chemistry

Title of the Course	M.Sc. (Applied Chemistry)
Level	Post Graduate
Duration of course	2 Years (Four Semesters)
Admission by Open test?	Yes
Sanctioned Intake	40
Regular /Part time	Regular
Grant in aid/Higher payment	Grant in aid
Eligibility	BSc. with Chemistry / Industrial Chemistry / Applied Chemistry/Polymer Chemistry as Principal Subject and any subsidiary subject with minimum 50% marks or equivalent grades. Admission with entrance test weightage 100% OR B.Sc. in Chemistry during final semester with any other subject (Physics, Mathematics, Zoology, Botany, Geology etc) with minimum 50% marks or equivalent grades. Admission with entrance test weightage 100%

Master of Science in Polymer Science

Title of the Course	M.Sc. (Polymer Science)
Level	Post Graduate
Duration of course	2 Years (Four Semesters)
Admission by Open test?	Yes
Sanctioned Intake	10
Regular /Part time	Regular
Grant in aid/Higher payment	Grant in aid
Eligibility	BSc. with Chemistry / Industrial Chemistry / Applied Chemistry/Polymer Chemistry as Principal Subject and any subsidiary subject with minimum 50% marks or equivalent grades. Admission with entrance test weightage 100% OR B.Sc. in Chemistry during final semester with any other subject (Physics, Mathematics, Zoology, Botany, Geology etc) with minimum 50% marks or equivalent grades. Admission with entrance test weightage 100%

Postgraduate Diploma in Corrosion Technology

Title of the Course	PGD in Corrosion Tech (PGDCT)
Level	Post Graduate Diploma
Duration of course	1 Years (Two Semesters)
Admission by Open test?	Merit based
Sanctioned Intake	10
Regular /Part time	Regular
Grant in aid/Higher payment	Grant in aid
Eligibility	B.Sc. in Chemistry/Industrial Chemistry/ Applied Chemistry as the Principal Subject or B. E. (Metallurgy/Chemical) with minimum 45% of marks or its equivalent

Teaching and Examination Scheme

M Sc in Applied Chemistry (Four Semesters Course)

<u>Sr. No.</u>	<u>Subject</u>	<u>Teaching hrs/week</u>	<u>Exam Marks</u>	<u>Total Marks</u>
First Semester of M.Sc.-I (Applied Chemistry)				
1	Advanced Inorganic Chemistry	4	100	
2	Advanced Organic Chemistry	4	100	
3	Advanced Physical Chemistry	4	100	
4	Analytical Chemistry	4	100	
5	Industrial Economics and Functional Management	4	100	
6	Advanced Inorganic Preparations (Practical)	4	50	
7	Advanced Organic Preparations (Practical)	4	50	
8	Advanced Physical Chemistry (Practical)	4	50	
		32		650
Second Semester of M.Sc.-I (Applied Chemistry)				
9	Chemical Process Industries – I	4	100	
10	Chemical Process Industries – II	4	100	
11	Materials Science	4	100	
12	Drugs	4	100	
13	Chemical Engineering Operations and Calculations	4	100	
14	Chemical and Industrial Analysis and Quality Control (Practical)	4	50	
15	Computational Techniques in Chemistry	2	50	
16	Computational Techniques in Chemistry (Practical)	2	50	
17	Engineering Drawing (Practical)	2	50	
		30		700
First Semester of M.Sc.-II (Applied Chemistry)				
18	Petrochemicals	4	100	
19	Surfactants	4	100	
20	Heavy Chemicals	4	100	
21	Industrial Chemistry	4	100	
22	Chemical Engineering Kinetics and Process control	4	100	
23	Advanced Organic Syntheses and Separations (Practical)	10	100	
24	Seminars and Industrial Visits	4	50	
		34		650
Second Semester of M.Sc.-II (Applied Chemistry)				
25	Agrochemicals and Fertilizers	4	100	
26	Dyes and Textile Auxiliaries	4	100	
27	Industrial Pollution	4	100	
28	Polymers, Plastics and Resins	4	100	
29	Instrumental Methods of Chemical Analysis	2	50	
30	Projects	12	200	
		30		650
		Grand Total		2650

Teaching and Examination Scheme

M Sc in Polymer Science (Four Semesters Course)

<u>Sr. No.</u>	<u>Subject</u>	<u>Teaching hrs/week</u>	<u>Exam Marks</u>	<u>Total Marks</u>
First Semester of M.Sc.-I (Polymer Science)				
1	Advanced Organic Chemistry	4	100	
2	Advanced Physical Chemistry	4	100	
3	Fundamentals of Polymer Science-I	4	100	
4	Rubbers and Adhesives	4	100	
5	Advanced Organic Preparations (Practical)	4	50	
6	Advanced Physical Chemistry (Practical)	4	50	
		24		500
Second Semester of M.Sc.-I (Polymer Science)				
7	Fundamentals of Polymer Science-II	4	100	
8	Polymer Blends & Composites	4	100	
9	Characterization of Polymers	4	100	
10	Industrial and Speciality Polymers-I	4	100	
11	Synthesis & Characterization of Polymers	6	50	
		22		450
First Semester of M.Sc.-II (Polymer Science)				
12	Analytical Chemistry	4	100	
13	Polymer Processing	4	100	
14	Industrial and Speciality Polymers-II	4	100	
15	Analytical Chemistry (Practical)	4	50	
16	Polymer Processing & Testing Laboratory	6	50	
17	Seminar	2	50	
		24		450
Second Semester of M.Sc.-II (Polymer Science)				
18	Projects	24	200	
		24		200
			Grand Total	1600

Teaching and Examination Scheme

Postgraduate Diploma in Corrosion Technology (PGDCT) (Two Semesters Course)

<u>Sr. No.</u>	<u>Subject</u>	<u>Teaching hrs/week</u>	<u>Exam Marks</u>	<u>Total Marks</u>
First Semester of PGDCT				
1	Material Science	6	100	
2	Principles of Corrosion	4	100	
3	Forms of Corrosion	4	100	
4	Chemistry of Corrosion Environment	4	100	
5	Theory of Inhibition and Control of Corrosion	4	100	
6	Laboratory Practical-I Tw and Viva	8	100	
		30		600
Second Semester of PGDCT				
7	Corrosion Prevention and Surface Protection	4	100	
8	Project	4	100	
9	Electrode Kinetics and Corrosion Testing	4	100	
10	Corrosion Resistant Materials and Selection	4	100	
	Laboratory-II Tw and Viva	8	100	
11	Seminar	2	50	
		26		550
		Grand Total		1150



Faculties of the Department

The faculty of Applied Chemistry Department is a carefully selected team who are not only well qualified but highly dedicated to their profession. They walk the extra mile through personal mentoring. We have a team of excellent faculty with impeccable credentials, excellent qualifications and Industry experience with prestigious organizations, capable of delivering to the students, what Industry expects from them.

Name of Faculties	
Prof. (Dr.) P. T. Deota	Professor & Head
Prof. (Dr.) R. C. Tandel	Professor
Dr. Sanjeev Kumar	Associate Professor
Dr. Chetan K. Modi	Associate Professor
Dr, Sandhya N. Dixit	Assistant Professor
Dr. Rakesh K. Sharma	Assistant Professor
Dr. Ran Bahadur	Assistant Professor
Dr. Babita Sehgal	Assistant Professor
Dr. Pankaj Sharma	Assistant Professor
Dr. Vaishali Suthar	Temporary Assistant Professor
Ms Darshana Hirpara	Temporary Assistant Professor
Ms Vaibhavee Patel	Temporary Assistant Professor

Thrust Areas of Research

The department staff have been actively engaged in **Ph.D Programme** (Research).

The research areas such as

- Polymers and polymeric materials and their applications
- Design, synthesis and application of Liquid Crystalline materials
- Organic Synthesis, Natural product chemistry
- Photochemical and photophysical processes
- Solution behaviour and applications of Surfactants/ Pluronics
- Catalytic aspects of Micro- and Mesoporous materials
- Sustainable Chemistry

Instrumental facilities available at Department



- ✓ Transmission Electron Microscope (TEM), *Jeol*
- ✓ Fourier Transmission Infrared Spectrometer (FTIR), *Shimadzu*
- ✓ Gel Permeation Chromatogram (GPC), *Agilent*
- ✓ Differential Scanning Calorimeter (DSC), *Shimadzu*
- ✓ Thermal Gravimetric Analyser (TGA), *Shimadzu*
- ✓ High Performance Liquid Chromatograph (HPLC), *Shimadzu*
- ✓ Rheometer, *Thermo Fisher*
- ✓ Microwave Reactor, *Anton Paar*
- ✓ Polarizing Microscope, *Leitze Nikon*
- ✓ UV -Visible Spectrofluorophotometer, *Shimadzu*
- ✓ UV-Visible Spectrometer, *Shimadzu*
- ✓ Digital Polarimeter, *Kruss*
- ✓ Rotary Evaporator, *Hedolph*
- ✓ Freeze dryer, *Analytica*

Placement assistance at Department



Center of Excellence in Polymers

APPLIED CHEMISTRY DEPARTMENT

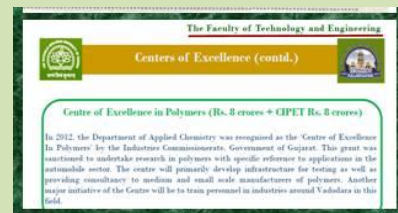
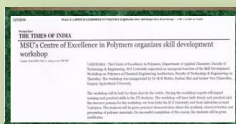


A CoE has been sanctioned to the Applied Chemistry Department by the Industries and Mines Department, Government of Gujarat. This Centre was set up keeping in view the research requirements of rapidly industrializing Gujarat in the area of polymers. Since many automobile giants are setting up their manufacturing facilities in Gujarat, there is an urgent need to have a specialized centre where advanced research and development activity can be undertaken.

Vadodara is surrounded by many companies manufacturing polymers for various applications in the automobile parts. Many automobile manufacturers in this industrial belt need continuous improvement and upgrading of technologies for development of advanced polymers and testing facilities for polymer products. The M. S. University of Baroda has a major share in skilled manpower recruited by these companies. The new Centre of Excellence in Polymers will also give boost to the facilities being provided for the training of skilled manpower which will be useful for plastic and automobile industries. The Centre also aims at encouraging entrepreneurs by giving the new industries readily available modern laboratories with pilot plant facility.

Vision : Be a partner in State's Technological Growth in terms of becoming an Innovation centre, Knowledge centre, Human resource development centre and Training centre for producing excellent technical manpower.

Mission : To be an Umbrella Center in the State for catalyzing and facilitating application of knowledge in polymers in a holistic manner to make Gujarat a Knowledge driven Economy and also to implement innovative projects for societal benefits..



CoE is actively engaged in organizing the Scientific sessions, National conference and Skill Development Workshop for the benefits of the students.





Estd. 1949,
Accredited Grade 'A' by AAC

ADMISSIONS OPEN FOR GUJARAT'S LEADING STATE UNIVERSITY,

The Maharaja Sayajirao University of Baroda!



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Contact

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