



An Educational Initiative By



FIVE-DAYS WORKSHOP

"NMR Spectroscopy: From Principle to Practice"

DATE AND TIME

***21st September 2026, 10:00 am
to 25th September 2026 4:00 pm***



Quality Education



Industry Relevant Curriculum



Experienced Faculty



Holistic Development



At. & Po. Rajpur, Taluka Kadi,
District Mehsana, Gujarat - 384440
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An Educational Initiative by

CADILA PHARMACEUTICALS LIMITED

CHIEF PATRONS

Dr. J. S. YADAV
(Research Director, Indrashil University)

PATRONS

Dr. Kartik Jain (Registrar)
Dr. Keshri Nath Tiwari (Dean, School of Science)

CONVENERS

Dr. Poulomi Sengupta,
Dr. Shally Rana
(Assistant Professors, Department of Chemistry)

CONTACT PERSONS

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ABOUT THE PROGRAMME

Nuclear Magnetic Resonance (NMR) spectroscopy is one of the most powerful and versatile analytical techniques for understanding the structure, dynamics, and molecular environment of chemical systems.

It plays a central role in modern chemistry, materials science, chemical biology, pharmaceuticals, and interdisciplinary research. With advances in instrumentation and multidimensional NMR techniques, the scope of NMR has expanded far beyond routine structural characterization.

In the real-world, undergraduate and postgraduate students, as well as early-career researchers, often acquire theoretical knowledge of NMR without sufficient exposure to modern instrumentation, experimental procedures, spectral acquisition, processing, and interpretation. There is therefore a need for hands-on training that bridges the gap between classroom concepts and practical NMR applications.

In alignment with this need, the proposed five-day hands-on training workshop, titled "NMR Spectroscopy: From Principle to Practice," aims to provide participants with comprehensive exposure to the fundamental principles and practical aspects of modern NMR spectroscopy.

The first two days of the workshop will focus primarily on ^1H NMR spectroscopy, the most widely used NMR technique. These sessions will cover the fundamental principles of NMR, instrumentation, sample preparation, data acquisition, data processing, and interpretation of ^1H NMR spectra. Participants who wish to attend only the ^1H NMR component may exit the programme after the first two days.

The subsequent three days will focus on ^{13}C NMR and advanced two-dimensional (2D) NMR techniques, including COSY and NOESY, with particular emphasis on their applications in structural elucidation. Participants completing the full five-day workshop will receive a separate certificate of participation.

Through lectures, demonstrations, hands-on experiments and spectral interpretation, the workshop seeks to develop practical confidence and analytical skills, enabling participants to effectively use NMR as a powerful tool for modern chemical research.

DISTINGUISHED SPEAKERS

1. Prof. Shailesh R. Shah. *Professor, Department of Chemistry, M.S. University of Baroda.*
2. Dr. Shrikant Kunjir. *NMR Spectroscopist Former Service Application Engineer – Bruker*
3. Prof. Keshri Nath Tiwari. *Professor, Department of Chemistry, Indrashil University*

THE TARGET AUDIENCE

Bachelor's and Master's students in Chemistry and Pharmacy

Ph.D. scholars and research students in Chemistry and Pharmacy

Faculty members and academic researchers working in relevant areas

Industry professionals involved in chemical, pharmaceutical, and related research
Anyone interested in upgrading their expertise in modern NMR techniques and their applications

ABOUT INDRASHIL UNIVERSITY

Indrashil University is an educational initiative of Cadila Pharmaceuticals Ltd. It is established by the Act of State Legislature of Gujarat as a State Private University under Gujarat University Act, 2009. This university has established Centres of Excellence in the area of Chemical Sciences, Synthetic Biology, Microbiology, Animal Tissue Culture and with whole new industrial revolution in the field of Biotechnology with the multiple applications in Green Chemistry, Energy Harvesting, Pharmaceuticals, Nanomaterials, etc. The university was established by its founding chancellor Dr. Rajiv I. Modi in the loving memory of his parents, Shri Indravardhan A. Modi and Smt. Shilaben Modi who laid the founding stone of Cadila Pharmaceuticals Limited in 1951. All the programs of Indrashil University offer updated course curriculum with choice-based credit system with industry inculcated syllabus to provide future-ready skilled professionals. The School of Science at Indrashil University offers degree programs at the undergraduate, postgraduate and doctoral levels in chemical, biological, and forensic sciences. The programs of School of Science are designed with focus on industry needs and requirements resulting to multi-faceted and job-ready professionals. The research laboratories of School of Science are equipped with highly sophisticated instruments and infrastructural facilities.

ABOUT THE DEPARTMENT OF CHEMISTRY

The Department of Chemistry offers B.Sc., M.Sc., and Ph.D. programs in Chemical Sciences, providing students with a strong foundation in contemporary chemical sciences and research. The faculty members are highly qualified, with Ph.D. degrees from reputed national institutes and CSIR laboratories, and are committed to mentoring students towards successful careers in research, academia, and industry.

Being under the umbrella of Cadila Pharmaceuticals Ltd., the department provides students with valuable exposure to both academic learning and industrial practices, thereby fostering a strong interface between education, research, and industry.

The department is also equipped with a functional 400 MHz Bruker NMR spectrometer, which serves as an important analytical facility for teaching, research, and characterization of chemical compounds. The availability of this advanced instrumentation within the department will be a significant advantage for the proposed NMR workshop, providing participants with opportunities for hands-on exposure, practical demonstrations, spectral interpretation, and an understanding of modern NMR instrumentation and applications.



Group Photo from NSCSIR 2026

SCOPE OF THE PROGRAM

- Hands-on NMR Instrumentation:** Familiarize participants with modern NMR spectrometers, sample preparation, probe selection, tuning, shimming, calibration, and basic data acquisition.
- Fundamentals to Advanced NMR:** Develop a strong understanding of ^1H and ^{13}C NMR and introduce advanced multidimensional techniques such as COSY and NOESY.
- Spectral Processing and Interpretation:** Provide practical training in NMR data processing, peak identification, chemical shifts, coupling patterns, integrations and interpretation of 1D and 2D spectra.
- Structure Elucidation:** Train participants to systematically use NMR data for molecular structure determination and solve real-world structural elucidation problems.
- Research Applications:** Demonstrate the applications of NMR across organic, inorganic, analytical and physical chemistry, chemical biology, pharmaceuticals, materials science, forensic science, and interdisciplinary research, enabling participants to confidently apply NMR in their own research.

TENTATIVE PROGRAM SCHEDULE

Date	Time	Session/Activity	Details
21-09-2026	10:00 AM-11:00 AM	NMR Fundamentals	Nuclear spin, magnetic moment, Larmor frequency, resonance, T ₁ & T ₂ relaxation
	11:00 AM-12:00 PM	NMR Instrumentation	Magnet, probe, shim, lock system, RF transmitter/receiver and safety
	12:00 PM-1:00 PM	^1H NMR – Theory & Demonstration	Chemical shift, integration, multiplicity and J-coupling
1:00-2:00 PM : Lunch Break			
22-09-2026	2:00 PM-4:00 PM	Hands-on ^1H NMR	Sample preparation, tuning, locking, shimming, acquisition and spectral interpretation
	10:00 AM-11:00 AM	^1H NMR – Theory & Demonstration	Introduction to solid-state NMR
	11:00 AM-1:00 PM	^1H NMR-Structure elucidation	Puzzles (solving molecular structures using NMR data)
1:00-2:00 PM : Lunch Break			
23-09-2026	2:00 PM-4:00 PM	Software Training	MestReNova & Bruker TopSpin; peak picking, integration, multiplet analysis and referencing
	10:00 AM-11:00 AM	^{13}C NMR	Principles, sensitivity and broadband decoupling
	11:00 AM-12:00 PM	DEPT NMR	DEPT-45, DEPT-90, DEPT-135; CH, CH ₂ and CH ₃ identification
	12:00 PM-1:00 PM	^{13}C & DEPT Demonstration	Spectral comparison and interpretation
	1:00-2:00 PM : Lunch Break		
24-09-2026	2:00 PM-4:00 PM	Hands-on ^{13}C & DEPT	Puzzles (solving molecular structures using Melt data), Acquisition and interpretation DSO Exchange experiment
	10:00 AM-11:00 AM	2D NMR – COSY	Principle, diagonal/cross peaks and proton-proton coupling
	11:00 AM-12:00 PM	2D NMR – NOESY	Through-space interactions, conformation and stereochemistry
	12:00 PM-1:00 PM	COSY & NOESY Interpretation	Identification of proton networks and spatial correlations
	1:00-2:00 PM : Lunch Break		
25-09-2026	2:00 PM-2:45 PM	Hands-on COSY	COSY acquisition and interpretation
	2:45 PM-3:30 PM		NOESY acquisition and stereochemical assignment
	10:00 AM-11:00 AM	Advanced NMR Applications	Advanced spectral interpretation
	11:00 AM-12:00 PM	Case Studies	Natural products, pharmaceuticals and complex organic molecules Distribution of unknown spectral datasets
	12:00 PM-1:00 PM	Group Hands-on Activity	Complete structure elucidation using ^1H NMR, IR, ^{13}C NMR, DEPT, COSY and NOESY
	1:00-2:00 PM : Lunch Break		
	2:00 PM-3:00 PM	Short Exam and Feedback	
	3:15 PM-4:00 PM	Valedictory Session	Certificates and closing remarks

REGISTRATION FEES

The registration fee for the 5 days workshop is Rs/- 2199, for 2-days it is 999/-. The registration kit, high tea, lunch, transportation for Mehsana, Gandhinagar, Ahmedabad in fixed route and participation certificates are included. Hostel facilities and dinner are available on extra payment basis. Hostel per night 300 rupees, dinner as per mess charge (60 rupees per meal). The workshop can only be attended offline after registering by clicking the following registration link. Limited seats.

