SHIV NADAR
INSTITUTION OF EMINENCE DEEMED TO BE UNIVERSITY
DELHI NCR

DEPARTMENT OF MATHEMATICS
SCHOOL OF NATURAL SCIENCES

GRADUATE PROSPECTUS
Ph.D. in Mathematics
2025–26

https:/math.snu.edu.in/

Contents

Overview

The Department of Mathematics at SNIoE offers programs and courses that highlight the interdisciplinary and the multidisciplinary nature of the university. Its academic programs provide a solid base for careers in both academia and industry. There is a great demand for mathematicians in various sectors: investment banks, insurance companies, financial institutions, engineering consultancies, medical research, bioinformatics, software, computer security, and defense. Well trained students are also sought by universities all over the world for their research programs.

The following distinguishing features are common to all our programs:

- Accessibility to students from diverse backgrounds
- Melting of the artificial barriers between pure and applied mathematics and between mathematics and other disciplines.
- Exposure to leading mathematicians, scientists, and thinkers from India and abroad.

We have regular seminars, and have hosted national conferences and programs such as

- *Northern Regional Conference of the National Initiative in Mathematics Education* (2011, co-hosted with Ambedkar University, Delhi).
- *27th Annual Conference of the Ramanujan Mathematical Society* (2012)
- *Annual Foundation School* for Ph.D. students (2015 and 2021, sponsored by the National Centre for Mathematics).
- *Mathematical Training and Talent Search* program (2015 and 2016, sponsored by the National Board for Higher Mathematics).
- *Advanced Instructional School on Matrix Analysis* (2016, sponsored by the National Centre for Mathematics).
- *National Conference on Cross-disciplinary Applications of Complex Networks* (2018, sponsored by Science and Engineering Research Board, India).
- *Annual Conference of Indian Women and Mathematics* (June 2018, sponsored by National Board for Higher Mathematics).
- *Discussion meeting on zero mean curvature surfaces in the Lorentz-Minkowski space and related areas* (October 2022, sponsored by SNIoE).
- *Winter School on Games in Evolutionary Dynamics (2023).*

Research is further supported by facilities such as individual laptops/desktops for faculty, a 30-PC computer lab with Mathematica and Matlab, a generous library budget for books, and subscriptions to diverse journals. The department also has a Research Computer Lab and a Department Library which were initiated under the **DST-FIST** scheme.

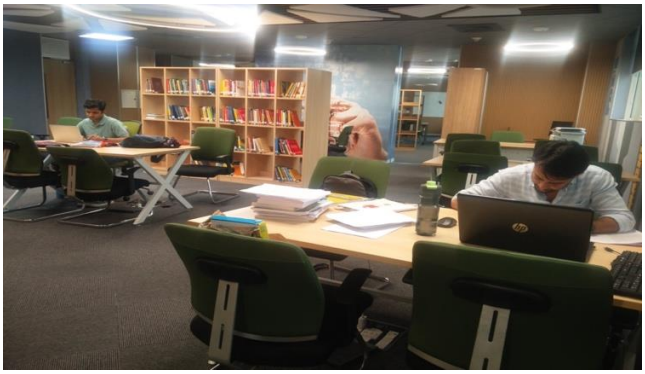
All graduate programs at SNIoE are managed and coordinated by the office of the **Dean of Academics**. The overall goals of graduate study at SNIoE are:

1. Provide scholars with a discovery-driven intellectual environment;

2. Develop scholars for leadership positions in academic and research focused organizations;
3. Encourage the development of interdisciplinary research orientation focused on tackling intellectually and socially relevant problems;
4. Train scholars in academic and research publishing processes;
5. Hone scholars' teaching abilities.

Faculty, staff, and Ph.D. students (2022).

The Department of Mathematics is housed in the
School of Natural Sciences.



Graduate students at the Department library

Mathematics Research Fiesta (2023)

Faculty

The members of the faculty of mathematics at SNIoE have studied or worked at leading institutions. Their mathematical interests vary across areas such as functional and harmonic analysis, representation theory, differential geometry, number theory, encryption, game theory, complex networks, graph theory, category theory, differential equations, optimization, signal

processing, computational methods, statistics, mathematical finance, machine learning, mathematical biology, and medical imaging.

Faculty Member	Qualifications	Research Area
Sanjeev Agrawal Professor	Ph.D. Delhi University M.A. Oxford	Functional Analysis, Operator Theory, Error Correcting Codes, and Encryption
Samit Bhattacharyya Associate Professor	Ph.D. Univ. of Calcutta M.Sc. Univ. of Calcutta	Applied Mathematics and Computational Biology
Sudeepto Bhattacharya Professor & Head	Ph.D. Nagpur University M.Sc. Nagpur University	Complexity, Game theory, Network Theory, and Mathematical Modeling
Indranil Biswas Senior Professor	Ph.D. TIFR	Algebraic Geometry, Topology, and Mathematical Physics
Dipti Dubey Assistant Professor	Ph.D. IIT Delhi M.Sc. Devi Ahilya Vishwavidyalaya Indore	Optimization and Game Theory
Priyanka Grover Associate Professor	Ph.D. ISI Delhi M.Sc. Univ. of Delhi	Matrix Analysis and Operator Theory
Neha Gupta Assistant Professor	Ph.D. Univ. of Warwick M.Sc. Univ. of Warwick	Quantum Groups and Category Theory
Parul Gupta	Ph.D. Universiteit Antwerpen, Belgium, Universität Konstanz, Germany M.Sc. IISER Mohali	Quadratic forms, Central simple algebras, Valuation theory, Algebraic number theory, Differential central simple algebras
Amber Habib Professor	Ph.D. Berkeley M.S. (Int) IIT Kanpur	Representation Theory and Mathematical Finance
Qazi Azhad Jamal Assistant Professor	Ph.D. AMU	Statistical Inference and Ordered Random Variables
Ajit Kumar Assistant Professor	Ph.D. Univ. of Houston M.S. Univ. of Houston	Partial Differential Equations, Finite Element Method, and Machine Learning
Pradip Kumar Assistant Professor	Ph.D. HRI M.Sc. IIT Kanpur	Differential Geometry and Global Analysis, Minimal Surfaces.
Sneh Lata Associate Professor; Graduate Advisor	Ph.D. Univ. of Houston M.S. Univ. of Houston	Operator Theory, Function Theory, and Frame theory.

Taduri Srinivasa Rao Distinguished Professor	Ph.D. ISI M.Sc. Andhra University	Functional Analysis and The geometry of Banach spaces
A Satyanarayana Reddy Associate Professor	Ph.D. IIT Kanpur M.Sc. Andhra University	Algebraic Graph Theory, Discrete Mathematics, and Algebraic Number Theory
Niteesh Sahni Associate Professor; Undergraduate Advisor	Ph.D. Delhi University M.Sc. Delhi University	Functional Analysis, Operator Theory, Dynamical Systems, and Machine Learning
Charu Sharma Assistant Professor	Ph.D. Shiv Nadar University M.S. Univ. of Houston	Bioinformatics and Computational Finance
Santosh Singh Associate Professor	Ph.D. IIT Kanpur M.A. Agra University	Medical image analysis, Image reconstruction, Computational photography, Light field, and Optimization techniques

Some of the journals in which our faculty members have published:

- Advances in Operator theory
- AKCE International journal of graphs and combinatorics
- Annals of Operations Research
- Archiv der Mathematik
- Bmc Infectious Disease
- Bulletin of Mathematical Biology
- Cerebral Cortex
- Ecological Complexity
- Ecological Informatics
- Ecological Modelling
- Epidemics
- Forum Mathematicum
- Frontiers in Genetics
- Genomics
- Geocarto International
- Houston Journal of Mathematics
- Indiana University Mathematics Journal
- International Game Theory Review
- IOSR J. Appl. Phys
- J. Bio Innovation
- Journal of convex analysis
- J. Difference Equations And Applications
- Journal of Energy Resources Technology
- Journal of Lie Theory
- Journal of Mathematical Chemistry
- Journal of Mathematical Analysis and Applications

- Journal of Ramanujan Mathematical Society
- Journal of Theoretical Biology
- Linear Algebra and its Applications
- Linear and Multilinear Algebra
- Leukemia Research
- Monatshefte fur Mathematik
- New York Journal of Mathematics
- Numerical Functional Analysis and Optimization
- PLoS ONE
- Positivity
- Proceedings of the American Mathematical Society
- Proceedings of the Indian Academy of Sciences
- Proceedings of the National Academy of Sciences, USA
- Proceedings of Mathematical Sciences
- Royal Society Open Science
- Scientific Reports-Nature
- Stochastic Analysis and Applications
- Studia Mathematica
- The Journal of Fourier Analysis and Applications
- Theoretical Population Biology
- Translational Pshychiatry

Ph.D. in Mathematics

The faculty members of the Department of Mathematics at SNU have research interests over wide areas of pure and applied mathematics. The broad areas of interest of our individual faculty have been listed earlier. Ph.D. students can also carry out their research in collaboration with faculty in other departments.

Awards won by our PhD students:

- Shivani Chauhan - Best paper award, International conference on Number theory and graph theory, Manipal Institute of Technology, 2023.
- Rekha Yadav – Best paper award (Application), International Symposium on Applied Optimization and Game Theoretic Models for Decision Making, Indian Statistical Institute, Delhi, 2023.
- Bharat Pratap Chauhan – Best paper award (methodology), International Symposium on Applied Optimization and Game Theoretic Models for Decision Making, Indian Statistical Institute, Delhi, 2023.
- Viney Kumar – J. B. Shukla Award, Nonlinear effect of sentiments and opinion sharing on vaccination decision in face of an outbreak: A multiplex network approach. (2024).

Some of our Ph.D. Alumni and their current affiliation

- Devendra Prasad (2019) – Assistant Professor, SNU Chennai, India.
- Monimala Neg (2019) – Assistant Professor, Adamas University, Kolkata, India.
- Shashankaditya Upadhyay (2019) – RA, Department of Physics, IISER Kolkata, India.
- Aniruddha Deka (2021) – Postdoctoral Fellow, School of Veterinary Medicine & Biomedical Sciences, Texas A&M, USA.
- Samir Kumar Hazra (2021) – Postdoctoral Fellow, HRI, India.
- Bhawana Malik (2022) – Postdoctoral Fellow, Centre for Disease, Economics and Policy, Delhi, India.
- Sushil Singla (2022) – Assistant with PhD (FAMNIT), University of Primorska.
- Sushant Pokhriyal (2022) - Postdoctoral Fellow at University of South Florida, USA.
- Veer Panwar (2022) – Assistant Professor, Govt. Degree College Satpuli, Pauri Garhwal, Uttarakhand.
- Apoorva Singh (2023) – Postdoctoral Fellow, Herbert and Florence Irving Institute for Cancer Dynamics, Columbia University.
- K Suhith (2024) – Assistant Professor, GITAM deemed to be University.
- Shivani Chauhan (2024) – Assistant Professor, ABES Engineering College, UP.
- Anu Dochak (2025) - Postdoctoral Fellow, ICTS-TIFR, Bengaluru.

A summary of the Mathematics Ph.D. program is given below:

- **Duration:** Maximum of 5 years.
- **Course-Work:** The student must register for the following, in consultation with the Graduate Advisor:
    - Three courses of 4 credits each in the first semester for a candidate with master's degree.
    - A total of 18 credits in the first year for a candidate with a four-year bachelor's degree.
    - Research Methodology course.
    - Coursework in the second semester will depend on performance in the first semester.
    - Retention of fellowship requires a minimum CGPA of 7.0. For more details, see SNU **Policy for Retention of Tuition Fee Waivers**.
- **Degree Requirements:** To earn a Ph.D. degree the student must:
    - Complete the required course-work.
    - Pass the Comprehensive Examination, which consists of Qualifying Examinations and a Research Seminar, by the end of the 4th semester.
    - Publish one research paper in a refereed journal before thesis submission.
    - Submit and defend the doctoral thesis.

- **Eligibility:** A Master's degree in Mathematics or related disciplines with overall marks of at least 60% (or equivalent grade) Or a four-year Bachelor's degree in mathematics or related disciplines with overall marks of at least 75% (or equivalent grade). Please enquire in case you are uncertain about your eligibility for any reason.
- **Fees and Financial Aid:** Detailed information about the fee structure and the nature of assistantships are available on https://snu.edu.in/admissions/graduate-programs.

  Continuation of the assistantship is contingent on satisfactory performance in the program evaluated continuously, and compliance with all University regulations. Further, the scholarship is only offered for the regular duration of the Ph.D. program (i.e. 10 semesters).

  The detailed Ph.D. Regulations can be obtained from the SNIoE website https://snulinks.snu.edu.in/snuPolicies/Academics/DoctoralStudies/PoliciesForms/PhDRegulation/.

Admission Process

All interested candidates should apply online at https://snu.edu.in/admissions/graduate-programs/.After online submission and payment of application fee, send demand draft for application fee (if online fee payment mode is not used) by speed post to the University at the following address:

Ms. Lakshmi Arya
EA to the Head
Department of Mathematics
School of Natural Sciences
Shiv Nadar (Institution of Eminence Deemed to be University)
NH - 91, Tehsil Dadri
Gautam Buddha Nagar
Uttar Pradesh - 201314

This time we are taking students in the following areas:

- Algebra
- Optimization
- Functional Analysis
- Geometry
- Data Science
- Probability & Statistics

The admission process is a two-stage process. The first stage comprises a written exam and the second stage includes an interview.

Candidates who have cleared any of

- ***CSIR-UGC NET-JRF,***
- ***NBHM Fellowship,***
- ***NET***

will be exempted from the written exam, which means that they will directly appear for the the interview.

Syllabus

The written exam will consist of multiple-choice questions (MCQs) and include topics from Linear Algebra, Ordinary Differential Equations, Real Analysis, Complex Analysis, Algebra, Probability, and Statistics. The difficulty level will be equivalent to MSc/CSIR UGC-NET. The interview will be based on the written test and the candidate's selected research interest from the above list of areas.

Date of the Written exam and Interview: June 26-July 4, 2025.

Contact Us

For further details and clarifications, please write to one of the following:

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