

DEPARTMENT OF MATHEMATICS
SCHOOL OF NATURAL SCIENCES

GRADUATE PROSPECTUS

Ph.D. in Mathematics

2022–23

www.snu.edu.in

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Overview

The Department of Mathematics at SNU 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* (2018, sponsored by National Board for Higher Mathematics).
- *Conference on Zero mean curvature surfaces in the Lorentz-Minkowski space and related areas* (2022).

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 SNU are managed and coordinated by the office of the **Dean of Academics**. The overall goals of graduate study at SNU 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;



Department faculty, staff and graduate students in front of the Library in December 2015.



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



Graduate students at Research Computer Lab in the department. It was sponsored by DST under the FIST scheme.



The department library. It was sponsored by DST under the FIST scheme.

Faculty

The members of the faculty of mathematics at SNU 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	Areas of Interest
A Satyanarayana Reddy Associate Professor	Ph.D. IIT Kanpur M.Sc. Andhra University	Algebraic Graph Theory, Discrete Mathematics, and Algebraic Number Theory
Ajit Kumar Assistant Professor	Ph.D. Univ. of Houston M.S. Univ. of Houston	Partial Differential Equations, Finite Element Method, and Machine Learning
Amber Habib Professor	Ph.D. Berkeley M.S. (Int) IIT Kanpur	Representation Theory and Mathematical Finance
Charu Sharma Assistant Professor	Ph.D. Shiv Nadar University M.S. Univ. of Houston	Bioinformatics and Computational Finance
Dipti Dubey Assistant Professor	Ph.D. IIT Delhi M.Sc. Devi Ahilya Vishwavidyalaya Indore	Optimization and Game Theory
Neha Gupta Assistant Professor	Ph.D. Univ. of Warwick M.Sc. Univ. of Warwick	Quantum Groups and Category Theory
Niteesh Sahni Associate Professor; Undergraduate Advisor	Ph.D. Delhi University M.Sc. Delhi University	Artificial Intelligence, Mathematical modelling, Operator Theory
Pradip Kumar Assistant Professor	Ph.D. HRI M.Sc. IIT Kanpur	Differential Geometry and Global Analysis
Priyanka Grover Associate Professor	Ph.D. ISI Delhi M.Sc. Univ. of Delhi	Matrix Analysis and Operator Theory
Samit Bhattacharyya Associate Professor	Ph.D. Univ. of Calcutta M.Sc. Univ. of Calcutta	Applied Mathematics and Computational Biology
Sanjeev Agrawal Professor	Ph.D. Delhi University M.A. Oxford	Functional Analysis, Operator Theory, Error Correcting Codes, and Encryption
Santosh Singh Associate Professor	Ph.D. IIT Kanpur M.A. Agra University	Medical image analysis, Image reconstruction, Computational photography, Light field, and Optimization techniques
Sneh Lata Assistant Professor; Graduate Advisor	Ph.D. Univ. of Houston M.S. Univ. of Houston	Operator Theory, Function Theory, and Frame theory.
Sudepto Bhattacharya Professor & Head	Ph.D. Nagpur University M.Sc. Nagpur University	Complexity, Game theory, Network Theory, and Mathematical Modeling
Taduri Srinivasa Rao Distinguished Professor	Ph.D. ISI M.Sc. Andhra University	Functional Analysis and The geometry of Banach spaces

Some major journals in which our faculty members have published:

- Annals of Operations Research
- Bulletin of Mathematical Biology
- Forum Mathematicum
- Houston Journal of Mathematics
- Indiana University Mathematics Journal
- Journal of Mathematical Analysis and Applications
- Journal of Mathematical Chemistry
- Journal of Ramanujan Mathematical Society
- Journal of Theoretical Biology
- Plos-One
- Ecological Modelling
- Linear Algebra and its Applications
- New York Journal of Mathematics
- Proceedings of the American Mathematical Society
- Proceedings of the Indian Academy of Sciences
- Proceedings of the National Academy of Sciences, USA
- Scientific Reports-Nature
- Stochastic Analysis and Applications
- Studia Mathematica
- The Journal of Fourier Analysis and Applications

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.

In this round of admission we are admitting students in the following areas:

- Mathematical modelling
- Machine Learning
- Functional Analysis
- Optimization

The detailed SNU Ph.D. Regulations can be obtained from the SNU website. A summary of the Mathematics Ph.D. program is given below:

- **Duration:** Maximum of 5 years.

Admission: The admission process comprises two rounds. The first round consists of a written exam, and the second round consists of an interview. For more details, please see the **Admission Process** section

- **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.
 - 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). 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>.
- **Full financial support** will be provided to PhD students for attending two conferences within the country during the entire tenure of the PhD programme. This grant shall cover registration charges for the conference, boarding & lodging expenses, and Third AC train fare.

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).

Our Ph.D. Alumni and their current affiliation

- Devendra Prasad (2019) – Postdoctoral Fellow, IISER Tirupati, India.
- Monimala Neg (2019) – Assistant Professor, Adamas University, Kolkata, India.
- Shashankaditya Upadhyay (2019) – Postdoctoral Fellow, IISER Kolkata, India.
- Aniruddha Deka (2021) – Postdoctoral Fellow, Pennsylvania State University, 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)- Postdoctoral Fellow, University of Primorska, Slovenia.

Admission Process

All interested candidates should apply online at www.snu.edu.in. 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 University P.O.
NH-91, Tehsil Dadri
District Gautam Buddha Nagar, UP 201314, India.

The admission process is a two-stage process. The first stage comprises a written exam with a weightage of 40%, and the second stage includes an interview with a weightage of 60%. The candidates will be tested on the M.Sc.-level mathematics.

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.

The key dates for Ph.D. admission exams are:

Last date for applying	Written exam & Interview	Announcement of results
November 16, 2022	December 19-20, 2022	December 26, 2022

Contact Us

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

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