

January-March 2025 Issue 2.1

Quarterly Newsletter

Department of Mathematics & Statistics School of Physical and Biological Sciences Faculty of Science, Technology and Architecture



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DEPARTMENT OF MATHEMATICS & STATISTICS

Editorial Note...

MATHEMATICS IS NOT ABOUT NUMBERS, EQUATIONS, COMPUTATIONS, OR ALGORITHMS: IT IS ABOUT UNDERSTANDING — William Paul Thurston

Dear Readers,

Welcome to the fifth edition of *Infinity Insight*, the quarterly newsletter of the Department of Mathematics & Statistics. This publication is envisioned as a dedicated forum for highlighting department's academic developments, research milestones, and scholarly pursuits.

As **Mathematics** continues to drive innovation across data science, cryptography, computational modeling, artificial intelligence, and beyond, this newsletter reflects our commitment to both core and interdisciplinary excellence. The current edition features key research highlights, notable faculty and student accomplishments, workshop overviews, and collaborative initiatives from January to March 2025.

We hope this publication not only records our progress but also inspires and engages our vibrant mathematical community.

Thanks to all contributors and collaborators, with anticipation for continued scholarly growth in the issues ahead.

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Best Regards, Dr. Reema Jain

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Dr Reema Jain

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Dr Ankur Jain





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Mr. Surya Prakash (VI Sem. B.Sc. (Hons.) Mathematics)

Mr. Atreya Ghoshal (IV Sem. B.Sc. (Hons.) Mathematics)

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VISION & MISSION



VISION

To be a global hub for academic excellence, innovation, and human development in mathematics



MISSION

- Develop competent professionals in Mathematics and Statistics.
- Foster interdisciplinary collaboration for holistic problem-solving.
- Instill good human values for ethical and responsible research.
- Contribute to societal well-being through data-driven solutions.
- Cultivate leaders with a strong sense of social responsibility.

EVENTS ORGANIZED

NATIONAL SCIENCE DAY 2025 : A GRAND CELEBRATION OF SCIENTIFIC SPIRIT

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The School of Physical and Biological Sciences at Manipal University Jaipur celebrated **National Science Day** on February 28, 2025, with great enthusiasm and participation. The Department of Mathematics and Statistics played a key role in organizing and coordinating the entire celebration. The event was graced by Chief Guest Prof. Purnendu Ghosh, and Guests of Honor Prof. H. N. Verma and Prof. Pravin Chandra Trivedi. The celebration witnessed the participation of 118 students from various schools and approximately 90 faculty members.





A special highlight of the day was the impactful Nukkad Natak presented by the students on the theme of Swachh Bharat Abhiyan, drawing attention to the importance of cleanliness and environmental responsibility. The engaging and interactive event "Fun with Science" organized by Gram Asha Club also drew large crowds, as students demonstrated exciting scientific experiments, making science both accessible and enjoyable. The other competitions were Poster Presentation Competition, Rangoli Making Competition and Quiz Competition. The event concluded with the felicitation of the competition winners.

INITIATIONS INTO MATHEMATICS (InitMath): A WEEK OF MATHEMATICAL ENRICHMENT

The Department of Mathematics and Statistics organized a popular undergraduate training programme, **"Initiations into Mathematics" (InitMath),** under the MTTS Trust funded by the National Board for Higher Mathematics (NBHM). This week-long workshop was held from January 06 to January 11, 2025.

The event provided a vibrant academic platform for young mathematical minds to engage with expert faculty from reputed institutions across the country. Intensive courses in Foundations, Linear Algebra, and Real Analysis were delivered using the renowned MTTS teaching methodology, known for its focus on active learning and conceptual clarity. Distinguished professors and mentors enriched the experience, offering deep mathematical insights and inspiring students to pursue the subject with greater passion. Participants described the workshop as intellectually stimulating and transformative.



Atreya Ghoshal, Vikas Choudhary, Caleb D'Souza, and Aditya Panwar, second-year students of B.Sc. (Hons.) Mathematics from the Department of Mathematics and Statistics, Manipal University Jaipur, successfully participated in the workshop and benefitted significantly from the exposure and learning.

Convener : Dr Mahesh Dubey



ALUMNI TALK

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Mr. Sanjeev Kumar, a proud alumnus from the B.Sc. (Hons.) Mathematics batch of 2020–2023 and currently pursuing his M.Sc. in Mathematics at IIT Bombay, delivered an inspiring talk on **"Your Career Roadmap: Opportunities After Graduation"** during the Alumni Talk-A-Thon 2.0 on 30th March 2025. He highlighted various career opportunities after graduation and provided students with a clear, motivating roadmap for their future.

Convener : Dr Ashok Pal

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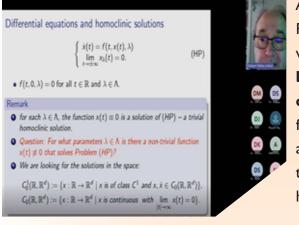
GUEST LECTURES

On February 11, 2025, a guest lecture on "**Importance of Probability Models in Engineering**" was delivered by Prof. G.K. Vishwakarma from IIT Dhanbad. Prof. Vishwakarma highlighted the crucial role of probability models in handling uncertainty across various engineering fields. He discussed practical applications in reliability analysis, signal processing, quality control, and modern technologies like machine learning. The session was highly informative and interactive, sparking engaging discussions among students and faculty. The lecture concluded with a



vote of thanks, appreciating Prof. Vishwakarma's valuable insights. The event significantly enhanced the participants' understanding of probabilistic approaches in engineering.

Convener : Dr Ashish Kumar



Another guest lecture was organized on March 19, 2025. Dr. Roberts Skiba from Nicolaus Copernicus University, Poland, was invited to deliver a talk on **"A new criterion for bifurcation of homoclinic solutions for parameterized ordinary differential equations".** In his research, he focuses on nonlinear analysis, with particular interest in the applications of functional analysis and algebraic topology in the theory of differential equations (periodic trajectories, homoclinic and heteroclinic orbits).

Convener : Dr Giriraj Methi

ACTIVITY UNDER MoU

S	. No.	Name of Faculty	Title of Publication	Journal	Month of Publication
	1	Dr Reema Jain	Effects of Physical Determinants in an Unsteady Blood Flow in a Stenosed Artery	Songklanakarin Journal of Science and Technology	March, 2025

JOINT RESEARCH PUBLICATION

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RESEARCH VISIBILITY

FACULTY PUBLICATIONS

Q1 Journal Publications					
S. No.	Name of Faculty	Title of Publication	Journal	Month of Publication	
1	Dr Reema Jain & Dr Loganathan Karuppusamy	Implications of Entropy Generation in Bioconvective Flow on Maxwell Nanofluid Past a Riga Plate with Cattaneo- Christov Model	Partial Differential Equations in Applied Mathematics	January, 2025	
2	Dr Reema Jain & Dr Loganathan Karuppusamy	Entropy Formation in the Radiative Flow of Bioconvective Oldroyd-B Nanofluid across an Electromagnetic Actuator with Second-Order Slip: Active and Passive Control Approach	International Journal of Thermofluids	January, 2025	
3	Dr Loganathan Karuppusamy	Computational Study of the Magnetohydrodynamic Copper Water Nanofluid Flow through Concentric Cylinders Immersed in a Porous Medium	Journal of Thermal Analysis and Calorimetry	January, 2025	
4	Dr Loganathan Karuppusamy	Analysis of Water Based Casson Hybrid Nanofluid (Niznfe ₂ o ₄ + Mnznfe ₂ o ₄) Flow over an Electromagnetic Actuator with Cattaneo-Christov Heat-Mass Flux: A Modified Buongiorno Model	Partial Differential Equations in Applied Mathematics	January, 2025	
5	Dr Reema Jain & Dr Loganathan Karuppusamy	Computational Analysis of Darcy- ForchheimerFluid Flow in Rotating Frame with Nonlinear Radiation and Activation Energy	International Journal of Thermofluids	February, 2025	
6	Dr Ashish Kumar & Dr Monika Saini	Efficient Stochastic Framework for Availability Improvement of Doormat Manufacturing Plants Using Grey Wolf Optimization Algorithm	Quality & Quantity	February, 2025	
7	Dr Ashish Kumar & Dr Monika Saini	Applications of Institutionsticand Dual Hesitant Fuzzy Numbers in the Reliability Evaluation of Turbogenerators in Thermal Power Plants	International Journal of Information Technology	February, 2025	
8	Dr Ashish Kumar & Dr Monika Saini	Performance Analysis and Optimization in Renewable Energy Systems: A Bibliometric Review	Discover Applied Sciences	February, 2025	

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9	Dr Kalpna Sharma	Heat Transfer Analysis in Membrane Based Pumping Flow of Hybrid Nanofluids	European Physical Journal Plus	February, 2025
10	Dr Kalpna Sharma	Entropy Generation Analysis of Couple Stress Casson Fluid Flow through Non- Permeable Stretching Channel	European Physical Journal Plus	February, 2025
11	Dr Loganathan Karuppusamy	Computational Approaches for Singularly Perturbed Turning Point Problems with Non-Local Boundary Conditions	Partial Differential Equations in Applied Mathematics	February, 2025
12	Dr Anil Ahlawat & Dr Loganathan Karuppusamy	Computational Analysis of Sutterby Nanofluid with Heat and Mass Convective Conditions: A Comparative Study of Riga Plate and Stationary Plate	Discover Applied Sciences	February, 2025
13	Dr Loganathan Karuppusamy	Simulating Online and Offline Tasks Using Hybrid Cheetah Optimization Algorithm for Patients Affected by Neurodegenerative Diseases	Scientific Reports	March, 2025
14	Dr Loganathan Karuppusamy	Scientific Computing of Thermally Radiative Casson Blood Based Tri-Hybrid Nanofluid Flow Past an Exponential Expanding Surface with Gyrotactic Microorganisms: A Machine Learning Approach	Acta Mechanica Sinica	March, 2025
15	Dr Riya Jain	HybridizableDiscontinuous GalerkinMethod for Nonlinear Hyperbolic Integro-Differential Equations	Applied Mathematics and Computation	March, 2025
16	Dr Ashish Kumar & Dr Monika Saini	RAM Analysis and Performance Optimization of Paper Manufacturing Plant Using Nature-Inspired Algorithms	Discover Applied Sciences	March, 2025
17	Dr Ashish Kumar	Mathematical Modeling for Virus Immunization and Vaccination	Engineered Science	March, 2025
18	Dr Ruchika Mehta	Artificial Neural Network Analysis on Heat and Mass Transfer in MHD Carreau Ternary Hybrid Nanofluid Flow across a Vertical Cylinder: A Numerical Computation	International Journal of Thermofluids	March, 2025
19	Dr Kalpna Sharma	Exploring the Gyrotactic Microorganisms Flow over Cylinder/Plate with Eyring- Powell Model and Hybrid Nanofluids of Varied Nanoparticle Shapes	International Journal of Thermofluids	March, 2025

20	Dr Kalpna Sharma	Membrane-Driven Flow and Heat Transfer of Viscoelastic Fluids: MHD and Entropy Generation Analysis	International Journal of Numerical Methods for Heat and Fluid Flow	March, 2025				
	Other Journal Publications							
S. No.	Name of Faculty	Title of Publication	Journal	Month of Publication				
1	Dr Ashish Kumar & Dr Monika Saini	Mathematical Modeling and Availability Optimization of Bleaching System in Paper Industry	Life Cycle Reliability and Safety Engineering	January, 2025				
2	Dr Ruchika Mehta	Numerical Study of Williamson Fluid Flow over aStretching Sheet with Newtonian Heating Embedded in aPorous Medium in Presence of Thermal Radiation and Heat Source/ Sink	Journal of Nonlinear Mathematical Physics	January, 2025				
3	Dr Ashish Kumar & Dr Monika Saini	Availability Predictionsof Solar Power Plants Using Multiple Regression and Neural Networks: An Analytical Study	Journal of the Nigerian Society of Physical Sciences	January, 2025				
4	Dr Kalpna Sharma	Bioconvection of a Radiating and Reacting Nanofluid Flow Past a Nonlinear Stretchable Permeable Sheet in a Porous Medium	Journal of Biological Physics	January, 2025				
5	Dr Vivek Singh	An 11 Exact Exponential Penalty E ⁻ Function Method for E ⁻ Differentiable Vector Optimization Problems Under E ⁻ Exponential Type Invexity	Journal of Multi Criteria Decision Analysis	February, 2025				
6	Dr Ankur Kumar Jain	Dynamical Behavior and Chaos Control of the Conflicting Information Propagation on a Homogeneous Network System	Soft Computing	February, 2025				
7	Dr Giriraj Methi	An Efficient Approach for Mixed Neutral Delay Differential Equations	Computation	February, 2025				
8	Dr Bijender Singh	Fixed Point of Generalized F-Suzuki Contraction Mapping on Complete Extended B-Metric Spaces with Application	Filomat	March, 2025				
9	Dr Bijender Singh	Pseudo Reduced Fractional Differential Transform Method and its Applications	Advanced Studies: Euro-Tbilisi Mathematical Journal	March, 2025				

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10	Dr Vivek Singh	Mixed-Type Duality Approach for Interval-Valued Programming Problems with Vanishing Constraints	Results in Control and Optimization	March, 2025
11	Dr Vivek Singh	Nondifferentiable Minimax Programming Problems Under Higher-Order Convexity	UPB Scientific Bulletin, Series A: Applied Mathematics and Physics	March, 2025
12	Dr Ashish Kumar & Dr Monika Saini	Optimization of Resource Allocation Using Integer Programming of Improved Ratio Estimator Under Stratified Random Sampling	Reliability: Theory & Applications	March, 2025
13	Dr Ashish Kumar& Dr Monika Saini	Sensitivity Analysis and RAMD Investigation of Ghee Producing Unit of Milk Plant	Jordan Journal of Mathematics and Statistics	March, 2025
14	Dr Ruchika Mehta	Numerical Analysis of Nanofluid Flow through Mixed Convective Non-Linear Stretching Sheet Induced in Porous Media Along with Thermal Radiation	Structural Integrity And Life	March, 2025

Book Chapter/Conference Publications

S. No.	Name of Faculty	Title Of Publication	Journal	Month of Publication
1	Dr Ashok Kumar Pal	Prediction of Stock Market Using Machine Learning Algorithms	AIP Conference Proceedings	January, 2025
2	Dr Kalpna Sharma	Unsteady Flow and Heat Transfer between Two Co-Axial Infinite Rotating Porous Discs	AIP Conference Proceedings	January, 2025
3	Dr Giriraj Methi	Analysis of Nonlinear Pantograph Delay Differential Equations Using Differential Transform Technique	AIP Conference Proceedings	January, 2025
4	Dr Ashish Kumar & Dr Monika Saini	Signature Analysis of Physical Processing Unit of aSewage Treatment Plant	International Conference on ICT for Sustainable Development	March, 2025
5	Dr Ankur Kumar Jain	Spatio-Temporal Models of Different Bacterial Growth and Optimal Control Phenomena: A Review	International Conference on Nonlinear Dynamics: Modeling and Computation	March, 2025

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AWARDS & ACHIEVEMENTS

Ph.D. AWARDED

S. No.	Name of Research Scholar	Name of Supervisor	Title of Thesis	Date of Award
1	Vijay Singh Maan	Dr Ashish Kumar	Stochastic Modeling and Performance Optimization of Repairable Systems	January 20, 2025
2	Kavita Jat	Dr Kalpna Sharma	Exploration of Fluid Flow and Heat Transfter over a Moving Surface	January 22, 2025
3	Naveen Kumar	Dr Ashish Kumar	Use of Metaheuristic Approaches in Reliability Estimation of Industrial System	February 02, 2025

FACULTY AWARDS

S. No.	Name of Faculty	Award/Recognition	Society	Date
1	Dr Reema Jain	Editorial Board Member	Songklanakarin Journal of Science and Technology (Indexed in Scopus Q3)	January, 2025
2	Dr Ashish Kumar	Research Excellence Award 2024	IARS during the International Seminar on "Statistical Frontiers in Data Science (IS- SFDS-2025)" organized by the Department of Statistics, M.D. University, Rohtak	March 01, 2025
3	Dr Ashok Kumar Pal	International Travel Support	Anusandhan National Research Foundation (ANRF)	March 24, 2025
4	Dr Loganathan Karuppusamy	Editorial Board Member	Scientific Reports (Indexed in Scopus Q1)	March, 2025

TALKS DELIVERED

S. No.	Name of Faculty Event		Title of Talk	Date
1	Dr Ashish Kumar	Three Day Ttraining Program Software Driven Statistical Techniques for Data Analysis @ Department of Statistics, M. D. University, Rohtak	Empowering Data Science with Jamovi	February 06- 08, 2025
2	Dr Ashish Kumar	National Conference on Time Series, Analytics, and Recent Advances in Statistical Modeling (NCTAS 2025) @ Central University of Rajasthan, Kishangarh	Reliability Measures Estimation of Ready-Mix Cement Plant using Various Estimation Methods	February 10, 2025

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3	Dr Virendra Singh Chauhan	6 th NCRAPS-2025 @ DIT University Dehradun & NIT Uttarakhand	Stability Analysis of Fractional Differential Equations using Fixed Point	February 14-15, 2025
4	Dr Ashish Kumar	International Seminar on Statistical Frontiers in Data Science (ISSFDS- 2025) @ M. D. University, Rohtak	Exploring Regression Models: Types, Significance, Challenges, and Key Selection Criteria	March 01, 2025
5	Dr Ashish Kumar	International Conference on Recent Trends & Innovations in Mathematics, Statistics, and Scientific Computing (IC-RTIMSSC-2025) @ Indira Gandhi University, Meerpur, Rewari, Haryana	Availability Predictions of Solar Power Plants using Multiple Regression and Neural Networks	March 05-06, 2025
6	Dr Ruchika Mehta	Advances in Mathematical Sciences and Interdisciplinary Areas (RAMSIA-2025) @ GLA University Mathura, India	Basic Properties of Fluid Flow & its Behavior	March 28-29, 2025

EXTRACURRICULAR INVOLVEMENT

S. No.	Name of Faculty	Event	Organized by	Date
1	Dr Ankur <mark>Kumar Jain</mark>	Singing during Expression 6.0	HR Department, MUJ	February 14, 2025
2	Dr Ankur <mark>Kumar Jain</mark>	Group Dance during MUJ Excellence Awards 2024	HR Department, MUJ	March 28, 2025
3	Dr Ankur <mark>Kumar Jain</mark>	Solo Singing during Retreat SoPBS	HR Department, MUJ	March 29, 2025

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STUDENT ACHIEVEMENTS

PARTICIPATION IN ICFAiSE-2025

It is a matter of immense pride that our B.Sc. (Hons.) Mathematics students represented the University at the prestigious International Conference on Futuristic Aspects in Science & Engineering (ICFAiSE-2025), held at ICFAI University, Jaipur, on February 6–7, 2025. Under the mentorship of Dr. Bhagya Shree Meena, students Drashti Tailor, Vidhi Gharia, Vikas Choudhary, Harjot Singh Sadhu, Aditya Panwar, Navya Negi, and Atreya



Ghoshal participated with great enthusiasm, and



spirit. These students actively took part in the Poster Presentation Competition, and Atreya Ghoshal secured the first position in the competition for his poster on the **Infinity Calendar**. His presentation was met with overwhelming appreciation from the judges, who lauded his originality, clarity, and depth of thought.

COMMUNITY ENGAGEMENT

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On February 08, 2025, the **Gram Asha Club**, in collaboration with the **Scribbles Club**, organized a Fun with Science activity at **Government Praveshika Sanskrit School**, Dahmi Kalan, Rajasthan. The event aimed to ignite scientific curiosity among school students through engaging and interactive demonstrations. Caleb D'Souza and Surya Prakash, students of B.Sc. (Hons.) Mathematics, played an active role in the successful execution of the program. Their enthusiastic participation highlighted the department's commitment to community outreach and the promotion of science education.



IRATES AT APOGEE 2025 – A TRIUMPH OF MATHEMATICAL INGENUITY

We are proud to share that **IIRATES**, a team of six second-year B.Sc. (Hons.) Mathematics students from Manipal University Jaipur, under the mentorship of Dr. Kalpna Sharma, represented the University at APOGEE 2025, the prestigious tech fest of BITS Pilani held from March 28 to March 31, 2025. Selected from over 250 teams, **IIRATES** advanced to the top 15 finalists in the Prototype Project Presentation Competition with their original project, Solid Analysis—a novel mathematical exploration of solid structures.



Competing against engineering teams, they impressed judges with their clarity, conceptual strength, and



innovative thinking. One of the judges was so inspired that they personally encouraged the team to pursue publication and future presentations. Their achievement was lauded by Prof. N. N. Sharma, President MUJ, who commended the team and the Department of Mathematics and Statistics for fostering academic excellence. We heartily congratulate Atreya Ghoshal, Drashti Tailor, Akshita Bhati, Aayush Suryavanshi, Vidhi Gharia, Vikas Choudhary, and their mentor for this remarkable accomplishment. The π rates have brought great pride to Manipal University Jaipur!

DWANI COMPETITION-ONEIROS 2025

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We are delighted to share that Aayush Suryanvanshi, a second-year B.Sc. (Hons.) Mathematics student, secured second position in the prestigious Dwani Competition, held on February 23, 2025 during Oneiros, the Annual Cultural Fest of Manipal University Jaipur. His exceptional musical talent brought artistic acclaim to the Department



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ANNOUNCEMENTS

DEPARTMENT OF THE MONTH -TOP RESEARCH PERFORMANCE

The Department of Mathematics and Statistics has been recognized as the Department of the Month at MUJ for two consecutive months — **January and February 2025**, for exceptional research performance. Congratulations to all faculty members, researchers, and students for their hard work and well-deserved achievement!



WELCOME ANNOUNCEMENT



Dr. Bhagya Shree Meena joined the Department of Mathematics & Statistics as an Assistant Professor on January 06, 2025. She earned her Ph.D. in Mathematics from Sardar Vallabhbhai National Institute of Technology (NIT) Surat, after completing her M.Sc. in Mathematics from the Indian Institute of Technology (IIT) Jodhpur and B.Sc. in Mathematics from the University of Rajasthan, Jaipur.Her research interests lie in mathematical modeling and simulation, bioheat models, fractional and partial differential equations, radial basis functions, and meshless techniques for irregular domains.

We warmly welcome Dr. Bhagya Shree to the department and wish her great success in her academic journey with us.



THE HIDDEN CAUSE OF MATH FEAR: LEARNED HELPLESSNESS

Why do so many students fear mathematics? While complex formulas and strict evaluation systems are often blamed, a deeper psychological factor— learned helplessness —plays a major role. Learned helplessness occurs when individuals believe their actions have no effect on outcomes, even when success is within reach. This mindset can deeply affect students in mathematics, especially after repeated failure. They stop trying—not because they lack ability, but because they believe they can't succeed.



A well-known experiment illustrates this perfectly. Students were

divided into two groups and given a short assignment with four anagram puzzles. For the first group, all four puzzles were solvable. For the second group, the first three were impossible to solve, while the fourth was identical to the last question in the first group. Remarkably, most students in the second group failed to solve the final puzzle—even though it was solvable—because they had already given up. Their early failures led to a loss of confidence and motivation.

This same phenomenon shows up in classrooms, especially in math. Early struggles with numbers or concepts, if not addressed properly, can make students internalize failure. They stop seeking help, avoid the subject altogether, and believe math is simply "not for them."

As an undergraduate student, I've seen many classmates fall into this cycle—not for lack of intelligence, but because of fear. To break this, we must build a more supportive math culture: one that rewards effort, embraces mistakes, and teaches students that ability can grow with practice.

Math shouldn't be feared—it should be understood.

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- 2. Hiroto, D. S., & Seligman, M. E. P. (1975). Generality of learned helplessness in man. Journal of Personality and Social Psychology, 31(2), 311–327.
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- 4. Ashcraft, M. H., & Krause, J. A. (2007). Working memory, math performance, and math anxiety. Psychonomic Bulletin & Review, 14(2), 243–248.

-By Navya Negi

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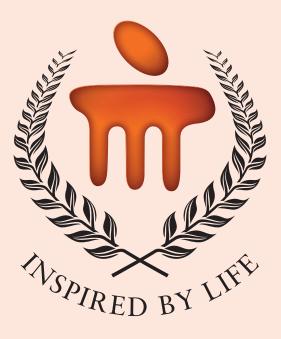
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PHOTO GALLERY



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