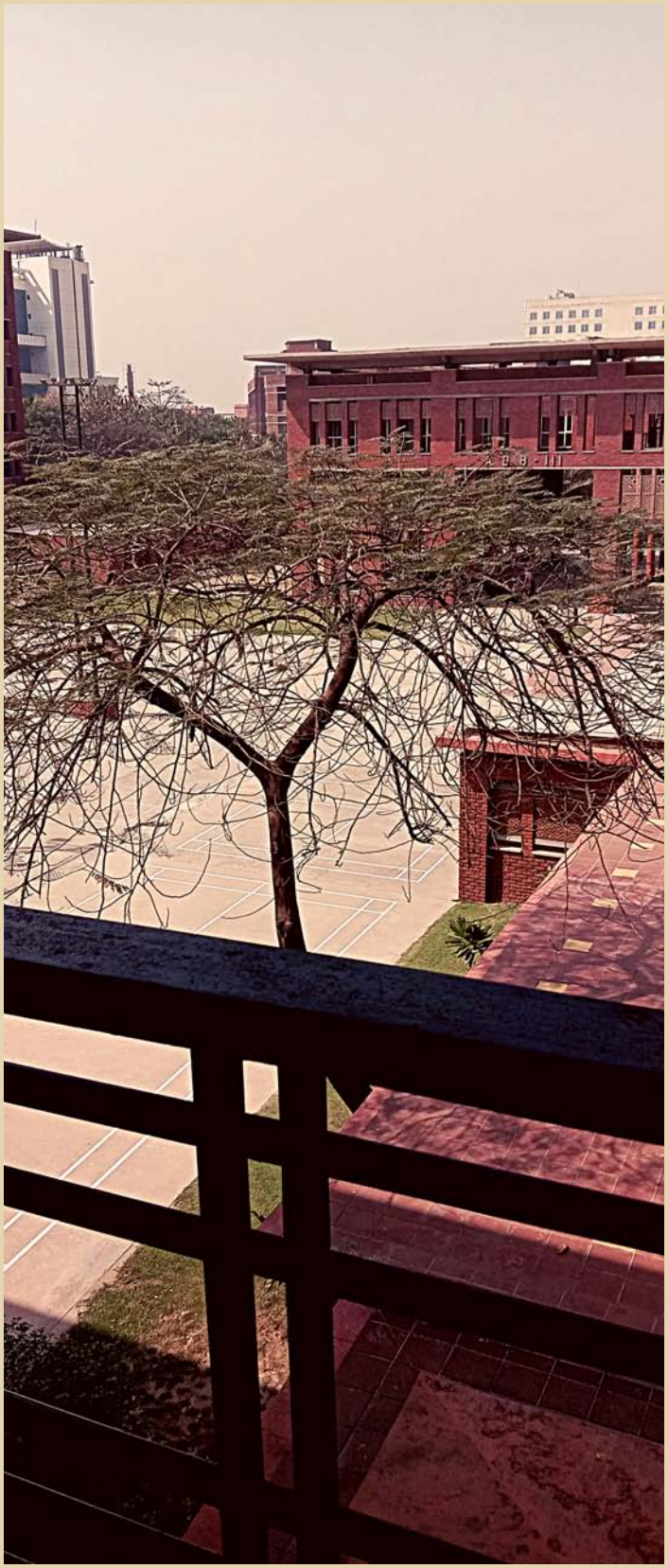
संख्या Sankhya

NEWSLETTER

Volume 1 • Issue 1 • September 2021

Department of Mathematics
Jaypee Institute of Information Technology, Noida
(Deemed to be University under Section 3 of UGC Act 1956)

Table of Contents



MESSAGE FROM THE

PRO-CHANCELLOR

Education is only complete when an individual is ready for all the challenges life throws at him. Education empowers the individuals to pursue their dreams and become skilled professional in building the future of India. An ideal education not just make an individual academically strong but also respect diverse cultures, human values and professional ethics. The same spirit is exhibited by the Department of Mathematics of Jaypee Institute of Information Technology (JIIT), Noida. I would like to congratulate the Department of Mathematics for presenting the inaugural issue of the Newsletter **Sankhya**. Wishing you all success in your endeavors! Keep learning and keep growing.

With best compliments,

Prof. S.C. Saxena
Pro-Chancellor
Jaypee Institute of Information Technology, Noida

MESSAGE FROM THE

VICE-CHANCELLOR

I believe education is what channelizes one's underdeveloped capabilities, frame of mind, and competencies into desirable channels. We at Jaypee Institute of Information Technology believe in achieving and promoting excellence in all emerging areas of training and research. With a similar objective, the Department of Mathematics has come up with its very first newsletter issue, **Sankhya** which advocates all the achievements of the Department over the semester. It intends to be catalogue of all the conferences, workshops, and expert talks offered to the students, as well as major achievements by faculty members, staff and students.

Wishing you all success and good health!

With best wishes,

Prof. Yog Raj Sood
Vice Chancellor
Jaypee Institute of Information Technology, Noida

MESSAGE FROM THE

HEAD OF THE DEPARTMENT

Welcome to the inaugural issue of **Sankhya**, the newsletter of the Department of Mathematics, Jaypee Institute of Information Technology (JIIT), NOIDA. This bi-annual newsletter is one of the Department's initiatives to reaffirm and share our commitment to groom and equip our students with necessary skills, attitude and knowledge to empower them to scale stellar heights in their chosen field, be it professional, management or academics.

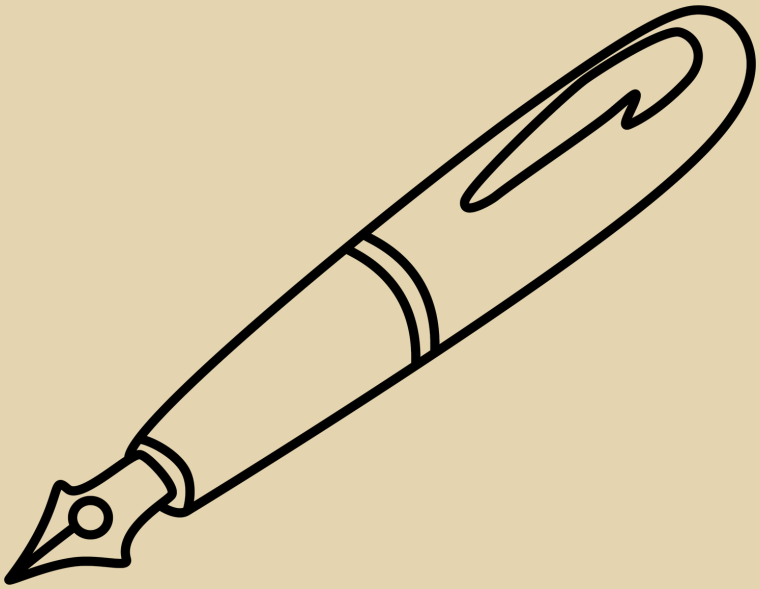
The field of mathematics, statistics and computational sciences is ever evolving at a fast pace. Our faculty members need to keep themselves updated with the latest advancements. As a reputed institution of learning we also need to set an example by adding to and extending the existing body of knowledge. We therefore organise and undertake research work, workshops, conferences, faculty development programs, guest lectures etc. I am happy to share with you that our Department has published more than 250 papers in journals & conferences and books or book chapters in the past 5 years. One of annual conference on "Recent Advances in Mathematical Sciences and its applications (RAMSA)" with participants from Academia and industry both, has won international acclaim. This year's RAMSA is scheduled to be held during 2nd and 4th December.

All disciplines of the Institute require proficiency in using mathematical, statistical and computational tools, which form a critical part of their students' skillset. However, the needs of different disciplines are often different. We are therefore in the process of introducing interdisciplinary curriculum by integrating appropriate tools with the specific requirements of various disciplines; such as Wavelets, Finite Element Method, Image processing, Signal processing etc. We shall share the progress and outcome of interdisciplinary curriculum in subsequent issues of the newsletter.

Please do share your feedback on contents and format

With best wishes,
Prof. Alka Tripathi
Head of the Department of Mathematics
Jaypee Institute of Information Technology, Noida

Message from Editorial Team



It is a matter of immense pride and privilege for us to bring out the very first edition of SANKHYA, the newsletter of the Department of Mathematics. This newsletter, SANKHYA, gives an insight into the Department of Mathematics that endeavors to evolve and create its own space of excellence in teaching and research and development of Pure as well Applied Mathematics. This newsletter will also serve as a platform for teacher's and students' literary and innovative skills. As you scan through the pages, it will enlighten you with the important milestones that the Department of Mathematics has achieved this semester. We express our considerable appreciation to all the faculty members for supporting us through this and making this newsletter stand out. With the continuous hard work and zeal of the Editorial Team, we hope that this newsletter will exhibit the hard work of the faculty members and students.

With Best wishes from the Editorial Board.

Editors
Dr. Yogesh Gupta
Dr. Shikha Pandey
(Assistant Professor)

Student Editors
Sakshi Singh
Rhema Simon
Shipra Vatsa
Argaja Mishra
(M.Sc. Maths, 2nd Yr)

Vision and Mission
Jaypee Institute of Information Technology

Vision

To become a center of excellence in the field of information technology and other related emerging areas of education, training, and research comparable to the best in the world for producing professionals who shall be leaders in innovation, entrepreneurship, creativity, and management.

Mission

Mission 1: To develop as a benchmark University in emerging technologies.
Mission 2: To provide a state-of-the-art teaching-learning process and R&D environment.
Mission 3: To harness human capital for a sustainable competitive edge and social relevance.

Vision and Mission
Department of Mathematics

Vision

To be a center of excellence in teaching and research in basic and applied areas of Mathematics.

Mission

Mission 1: To offer academic programs and courses in contemporary and emerging areas of Mathematics and its applications to develop analytical and problem-solving skills.
Mission 2: To carry out quality research in emerging areas of Pure and Applied Mathematics.
Mission 3: To foster interaction with national and international institutions for enrichment, application and dissemination of knowledge in Mathematics.

Programme Educational Objectives (PEOs)

Programme Name: M.Sc in Mathematics

PEO 1: To impart advanced theoretical and computational knowledge in the areas of mathematics.

PEO 2: To provide training and expertise to achieve career goals in academics, research, and related industry.

Correlation of PEOs with Department's MISSION

	Mission 1	Mission 2	Mission 3
PEO 1	3	3	2
PEO 2	2	2	1

Meet our Department

Prof. Alka Tripathi (H.O.D.)
Professor & Head

Prof. R. C. Mittal
Professor

Prof. A.K. Agarwal
Professor

Prof. B.P. Chamola
Professor

Prof. Lokendra Kumar
Professor

Dr. Amit Srivastava
Associate Professor

Dr. Pato Kumari
Associate Professor

Dr. P. K. Srivastava
Assistant Professor

Dr. Dinesh C. Singh Bisht
Assistant Professor

Dr. Anuj Bhardwaj
Assistant Professor

Dr. Yogesh Gupta
Assistant Professor

Dr. Lakhveer Kaur
Assistant Professor

Dr. Himanshu Agarwal
Assistant Professor

Dr. Vipin Chandra Dubey
Assistant Professor

Dr. Amita Bhagat
Assistant Professor

Dr. Pinky Chauhan
Assistant Professor

Dr. Neha Ahlawat
Assistant Professor

Dr. Richa Sharma
Assistant Professor

Dr. Neha Singhal
Assistant Professor

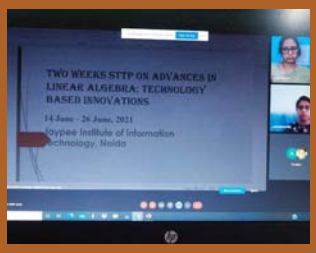
Dr. Mohd. Sarfaraz
Assistant Professor

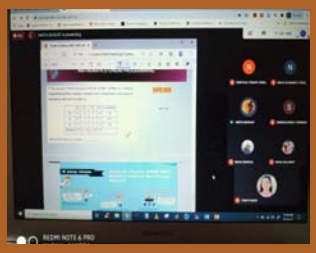
Dr. Nisha Shukla
Assistant Professor

Dr. Shikha Pandey
Assistant Professor

Events Organised by Department

(Jan - Aug 2021)





S. No.	Date	Name Of Conference/ Workshop/Seminar Organized
1.	12-01-21 to 16-01-21	Interactive online session on Career guidance for M.Sc. students
2.	14-06-21 to 26-06-21	2 weeks International Short Term Training Programme on Advances in Linear Algebra: Technology based Innovations
3.	26-06-21	Alumni meet "SIGMA 2021"
4.	30-06-21	Expert talk on "Some aspect of shadow and accretion disk around wormholes" by Prof. Farook Rahaman, Department of Mathematics, Jadavpur University, Kolkata
5.	23-08-21 to 28-08-21	FDP on "Recent Techniques for the Solutions of Nonlinear Differential Equations"

Publications by the Faculty Members

(Jan - Jun 2021)

Sr. No.	Journal Publications
1	Kumari, P. and Neha, "On quasi-seismic wave propagation in highly anisotropic triclinic layer between distinct semi-infinite triclinic geomedia", Applied Mathematical Modelling, vol. 91, pp. 815-836, 2021.
2	Ritu, Gupta Y., "Numerical Analysis Approach for Models of Covid-19 and Other Epidemics" International Journal of Modeling, Simulation, and Scientific Computing, 12 (03) (2021) 2041003.
3	Chhibber, D., Bisht, D.C. S. and Srivastava, P.K., "Pareto-optimal solution for fixed-charge solid transportation problem under intuitionistic fuzzy environment", Applied Soft Computing, vol. 107, p.107368, 2021.
4	Goyal, G. and Bisht, D.C. S., "Strong α-cut and associated membership based modeling for fuzzy time series forecasting", International Journal of Modeling, Simulation, and Scientific Computing, Vol.12, no. 1, p. 2050067, 2021.
5	Srivastava A. and Tanwar, P., "Interplay between symmetry, convexity and negation of a probability distribution", International Journal of Intelligent systems, vol. 36, No. 4, pp. 1876-1897, 2021, 2021.
6	Puneet Rana, Vishal Gupta and Lokendra Kumar "LTNE magneto-thermal stability analysis on rough surfaces utilizing hybrid nanoparticles and heat source with artificial neural network prediction", Applied Nanoscience, Published online 24 June 2021, Electronic ISSN: 2190-5517, https://doi.org/10.1007/s13204-021-01913-5[Indexed in Astrophysics Data System (ADS), Chemical Abstracts Service (CAS), Google Scholar etc.]
7	Bhardwaj A., Verma V.S. and Gupta S., "Image Authentication Using Block Truncation Coding in Lifting Wavelet Domain", International Journal of Image and Graphics, vol. 22, 2250011, 2022.
8	Wadhwa A., Bhardwaj A., "Contrast enhancement of MRI images using morphological transforms and PSO", Multimedia Tools and Applications, vol. 80, pp. 21595–21613, 2021.
9	Mittal, R.C., Goel, R. and Ahlawat, N., "An Efficient Numerical Simulation of a Reaction-Diffusion Malaria Infection Model using B-splines Collocation", Chaos, Solitons & Fractals, vol. 143, p.110566, 2021.
10	Mittal, R.C., Kumar, S., Jiwari, R., "A cubic B-spline quasi-interpolation algorithm to capture the pattern formation of coupled reaction-diffusion models", Engineering with Computer, pp 1-17, 2021.
11	Kumar, S., Kaur, L., Niwas, M., "Some exact invariant solutions and dynamical structures of multiple solitons for the (2+1)-dimensional Bogoyavlensky-Konopelchenko equation with variable coefficients using Lie symmetry analysis", Chinese Journal of Physics, vol. 71, pp. 518-538, 2021.
12	Bhagat, A., Sethi, R., Garg, D., "Controlled Arrival Machine Repair Problem with Working Vacation and Reattempts", International Journal of Mathematical, Engineering and Management Sciences, Vol. 6(1), pp. 279–295, 2021.

INTERNATIONAL CONFERENCES

Chauhan, P., Real Coded Genetic Algorithm for Selecting Optimal Machining Conditions, Proceedings of International Conference on Scientific and Natural Computing. Algorithms for Intelligent Systems. Springer, International Conference on Scientific and Natural Computing (SNC), 2021

BOOK CHAPTERS

Singhal N. and Sharma S.P., "Behavior Analysis of Polytube Industry Using Fuzzy Set Theory and Particle Swarm Optimization" in Reliability and Risk Modeling of Engineering Systems. EAI/Springer Innovations in Communication and Computing, pp 1-10, 2021

Participation by the Faculty Members

(Jan - Aug 2021)

Sr.No.	Date	Name Of Conference/ Workshop/Seminar Attended	Total Faculty Participated & Organized By	Type of event
1	08-01-21 to 14-02-21	"Algebra & Multivariate Calculus", A joint programme of INSA and NCM	Dr. Lakhveer Kaur, Dr. Harisingh Gaur vishwavidyalaya, Sagar, MP and National Center of Mathematics (IIT-B) and (TIFR)	Workshop
2	08-01-21 to 14-02-21	Online Teachers Enrichment Workshop on "Algebra & Multivariate Calculus"	Dr. Mohd. Sarfaraz, Dr. Harisingh Gaur vishwavidyalaya, Sagar, MP and National Center of Mathematics (IIT-B) and (TIFR)	Workshop
3	14-01-2021 to 27-01-21	Two Week Refresher Course on Mathematics and Statistics	Prof. R. C. Mittal, UGC- Human Resource Development Centre, GJSUT, Hisar	Invited talk
4	15-02-21 to 27-02-21	Two-week value added Introductory Course in Latex for Scientific Writing	Dr. Lakhveer Kaur Department of Mathematics, J. C. Bose University of Science and Technology, YMCA	Invited talk
5	05-03-21	Kshitij Mathematics Series	Prof. R. C. Mittal, Deshbandhu College , University of Delhi	Invited talk
6	16-03-21 to 30-03-21	Refresher Course In "Mathematics"	Dr. Dinesh C. S. Bisht Ramanujam College, University of Delhi	Workshop
7	16-03-21 to 30-03-21	Refresher Course In "Mathematics"	Dr. Pankaj Kumar Srivastava Ramanujam College, University of Delhi	Workshop
8	18-03-21	Mathematics Lecture Series	Dr. Lakhveer Kaur Department of Mathematics, Amity Institute of Applied Sciences, Amity University, Noida	Invited talk

9	21-05-21 to 03-06-21	Value Added Course on "C & C++"	Prof. R. C. Mittal, J. C. Bose University of Science and Technology, YMCA, Faridabad	Invited talk
10	24-05-21 to 29-05-21	Computational Tools for Research in Science and Technology 2021	Dr. Lakhveer Kaur AIAS, Amity University, Noida	Workshop
11	30-05-21	MATLAB Onramp	Dr. Pato Kumari Mathworks Training Services	Online course
12	09-07-2021	National Level Webinar on Recent Trends in Statistical Theory and Applications	Dr. Lakhveer Kaur Rathinam College of Arts and Science, Coimbatore.	National webinar Delivered an invited talk
13	25-07-21	National Webinar on Mathematicians' Career Dimensions and their Impact on Society	Dr. Richa Sharma Department of Mathematics, School of Technology, Pandit Deendayal Energy University, Gandhinagar, Gujarat	National event Delivered an invited talk
14	26-07-21 to 30-07-21	International Workshop on System Modelling and Artificial Intelligence(SMAI-2021)	Dr. Amita Bhagat Manipal University, Jaipur	Workshop

International

S. No.	Name of conference/workshop/seminar attended	Total faculty participated & organised by	Details of event
05-02-2021 to 06-02-2021	International conference on Scientific and Natural Computing (SNC 2021), GBU	Dr. Pinkey Chauhan Gautam Budha University, Greater Noida, U.P	International Event Chaired Session
06-02-21 to 08-02-21	2nd International Conference on Mathematical Modeling, Computational Intelligence Techniques and Renewable Energy(MMCITRE2021)	Prof. B. P. Chamola Pandit Deendayal Energy University, Gandhinagar, Gujarat and Forum for Interdisciplinary Mathematics	International Conference Invited talk
04-03-21 to-06-03-21.	6th Biennial International Group Theory Conference – 2021 (6BIGTC–2021)	Prof. B. P. Chamola School of Advanced Sciences, Vellore Institute of Technology, Vellore, Tamil Nadu, India; in association with Ferdowsi University of Mashhad, Iran	International Conference Session Chair
09-04-21 to 11-04-21.	International Conference on Analysis and Its Applications-2021 (ICAA_Nepal_2021)	Prof. B. P. Chamola Nepal Mathematical Society (NMS) in collaboration with Tribhuvan University (TU); Kathmandu University (KU), South Asian University (SAU) New Delhi India; Association of Nepalese Mathematicians in America (ANMA) USA and Nepal Sanskrit University (NSU)	International Conference Invited talk

Upcoming Events

International Conference : RAMSA (December 02-04, 2021)

विद्या तत्व ज्योतिसम:

5th International Conference

on

Recent Advances in Mathematical Sciences and its Applications (RAMSA-2021)

(December 02-04, 2021)

Organized in blended mode (Online & Offline)

by

Department of Mathematics

Jaypee Institute of Information Technology

A-10, Sector-62, Noida, U.P.-201309, India

Website: www.ramsaconference.com

ABOUT JIIT

The Jaypee Institute of Information Technology (JIIT) is declared as a deemed to be University under section 3 of UGC Act 1956. JIIT is fully backed and supported by the Jaypee Group of Companies through its not-for-profit trust – Jaiprakash Sewa Sansthan (JSS). It is situated near the Electronic City at Noida and is at a distance of about 3 Kms from New Delhi – UP border. The state-of-the-art campus aims at becoming a centre of excellence in the field of information technology & related emerging areas of education, training and research comparable to the best in the World for producing professionals who shall be leaders in innovation, entrepreneurship, creativity and management. The Institute offers Doctoral (Ph. D.), Post Graduate (M. Sc., M. Tech. and MBA) as well as Under Graduate (B. Tech.) programs in the various disciplines of Engineering, Sciences and Management. JIIT is a NAAC Accredited, AICTE approved and NIRF Ranked Institute in Delhi NCR.

ABOUT THE HOST DEPARTMENT

Mathematics plays a key role in the development of modern sciences, engineering, management and many other important areas of activities. With this aim in mind the Department of Mathematics was established from the very inception with a Vision to attain excellence in teaching and research and become a leader in the field of mathematics and its applications. Besides catering to the basic needs of the various B. Tech. / M. Tech. / Ph. D. programs of the Institute, it had a strong fervor towards research and development. The Department has a good blend of pure and applied mathematicians, which provides a vibrant research atmosphere. The specializations of the faculty members cover most of the important and emerging areas of Mathematics. The main research groups of the Department involve: Fractals and Chaos, Mathematical Analysis; Numerical Analysis and Computational Continuum Mechanics; Queuing, Fuzzy and Information Theory. The Department is also actively involved in its own research and development activities through its M.Sc., M. Tech. (Applied and Computational Mathematics) and Ph.D. Programs.

GOAL OF THE CONFERNCE

The aim of this conference is to bring together learned mathematicians, scientists, engineers, researchers from industry and research scholars working in the different areas of mathematics at a common platform. This will facilitate exchange of ideas regarding the research findings and new advances in mathematics in the wide area of mathematics, sciences and engineering and to discuss the practical challenges encountered in the different domains of applications and the solutions adopted thereto. Further, it will provide an opportunity to enhance collaboration among researchers not only from the various parts of the country but also with those from abroad. The scientific program will consist of Keynote/plenary/invited lectures and parallel sessions for contributed presentations. The main emphasis will be on the vibrant applicational aspects of applied mathematics in relation to diverse areas of engineering and sciences. The invited lectures and refereed contributed papers will be published in the proceedings after due reviewing process by the committee of experts in various disciplines. The conference proceedings of the previous series of RAMSA were published by **AIP (Scopus Indexed), USA**.

CALL FOR PAPERS

The broad topics of interest include, but are not limited to, the following:

- Algebra and Its Applications
- Analysis and Approximation Theory
- Coding, Cryptography and Information Theory
- Computational Fluid Dynamics
- Computer Graphics & Animation
- Continuum Mechanics and Vibrations
- Differential Equations and Applications
- Discrete Mathematical Structures
- Fixed Point Theory
- Fractals, Chaos and Dynamical Systems
- Fuzzy Mathematics and Logic
- Image Processing
- Numerical Analysis
- Optimization and Its Applications
- Probability, Statistics and Stochastic Processes
- Theory of Computation
- Wave Propagation
- Wavelets and Applications

Submit Now

IMPORTANT DEADLINES

Submission of Abstract	July 31, 2021
Acceptance of Abstract	August 5, 2021
Submission of Full Length Paper	August 31, 2021
Notification of Acceptance of paper	October 10, 2021
Submission of Final Manuscript	November 5, 2021

COMMUNICATION

All the communications may be addressed to:

Prof. B. P. Chamola, Dr. Pato Kumari & Dr. Lakhveer Kaur

Department of Mathematics

Jaypee Institute of Information Technology

A-10, Sector-62, Noida- 201309, U.P., India

Mobile: +91 9971962349, +91 8527533208, +919899273989

Email: conference.maths2016@gmail.com

Faculty and Student Achievements

(Jan - Aug 2021)

Faculty

Dr. Lakhveer Kaur is awarded with Top Most cited paper award 2020 by IOP (Institute of Physics), using citations recorded in Web of Science.

Student

Nishtha Tomar from M.Sc. Mathematics (2019-21), qualified GATE organized by IIT Bombay on 13.02.2021

PhD Completed

Sr. No.	Enrolment No.	Name	Thesis Title	Supervisor
1	16408001	Pallavi Verma	Exact Solutions to Some Nonlinear Evolutionary Partial Differential Equations	Dr. Lakhveer Kaur
2	15408002	Deval Verma	Recognition of 2D/3D Correctors and 3D Words Using Supervised Machine Learning Classifiers	Prof. Amrish Kumar Aggarwal & Dr. Himanshu Agarwal
3	15408003	Dhruva Dixit	Stability Problems of Double and Triple Diffusive Convection of Non-Newtonian Fluids	Prof. Amrish Kumar Aggarwal

Alumni Speaks

"I have joined JIIT in August 2005 as a faculty in the Department of Mathematics. Furthermore, I started my Ph.D. under the guidance of Late Prof. Sanjeev Sharma Sir and Prof. Bani Singh Sir and completed it in the year 2010. I have learned a lot during my stay in JIIT for 8 years till 2013 under the guidance of all my Seniors and colleagues with whom I have worked. I have worked under the leadership of many esteemed persons such as Prof. J.P. Gupta Sir, Prof. Medury Sir, and Prof. S.C. Saxena Sir. During my stay at JIIT, I have learned a lot in teaching, research, and other administrative activities which helped me to build my career and helped me in advancement. "

Dr. Manoj Sahni
Associate Professor and Head,
Department of Mathematics,
Pandit Deenadyal Energy University, Gandhinagar

"I have joined JIIT as a Research Scholar in 2006 under the guidance of Prof. B.P. Chamola and Prof. Bani Singh. I have learned a lot under the guidance of my Seniors and my guide related to teaching and research. During my tenure at JIIT, I have developed the skill of teaching and research and am thankful to all my Seniors. I have a great experience at JIIT."

Dr. Ritu Sahni
Assistant Professor
Indian Institute of Advanced Reasearch, Gandhinagar

"It was an amazing experience at JIIT that will stay with me. I learned a lot during my M.Tech(ACM) between 2009-2011. Professors of the mathematics department have rebuilt and shaped my career, as well as made me an excellent learner. Thanks a lot, JIIT."

Touseef Ahmad
Scientist at ISRO

Penned by the Faculty Members

Make gratefulness a habit

The renowned Wimbledon player Arthur Ashe was ailing with HIV-AIDS, which was passed into him during his heart surgery in the year 1983. As he was on the verge of dying, he received letter from his supporters from all over the domain. Out of these, a supporter said:
"Why does God have to select you for such a bad disease?"
Arthur replied to him by saying:
"More than 50 million kids start playing tennis all around the world but only
5 million actually learn to play tennis,
out of which only 5 lakhs takes expert training of tennis,
around 50 thousand able to come to the track,
about 5 thousand move to the grand slam,
only 50 reach Wimbledon and
4 enter semi-final and 2 to the finals.
While I was holding the Wimbledon trophy, I never questioned God,
"Why me?"
Therefore, now when I am in pain I don't have the right to say to God:
"Why me?"

Dr. Neha Ahlawat
Assistant Professor

Art of Questioning - Math Explorations

Competency in the art of questioning relies on the basis of all good teaching. One potential tool, to make engagement of students in Mathematics, is by Open-ended math explorations. Open-ended math explorations elaborate a simple scenario with no explicit problem to solve. Students are asked questions and then they used to find answers. Most significantly, explorations are an integral part in the International Baccalaureate (IB) diploma programme with Mathematics. Raising good questions is chief dialect to learn and exclusively more important in some situations, than receiving answers to those questions, peculiarly whenever the questions embolden learners to think critically. Another principal aspect is to up skill learners for using self -questioning to enhance their learning. Moreover, deeper learning is the quantitative process through which a person gains the capacity to apply the concepts in new situations, which were earlier learned, so that learning makes knowledge and skills transferable. For motivating, deeper student learning and facilitate thinking to the maximum cognitive levels, unambiguous directives must be supplied for by means of think aloud models for self questioning of students.

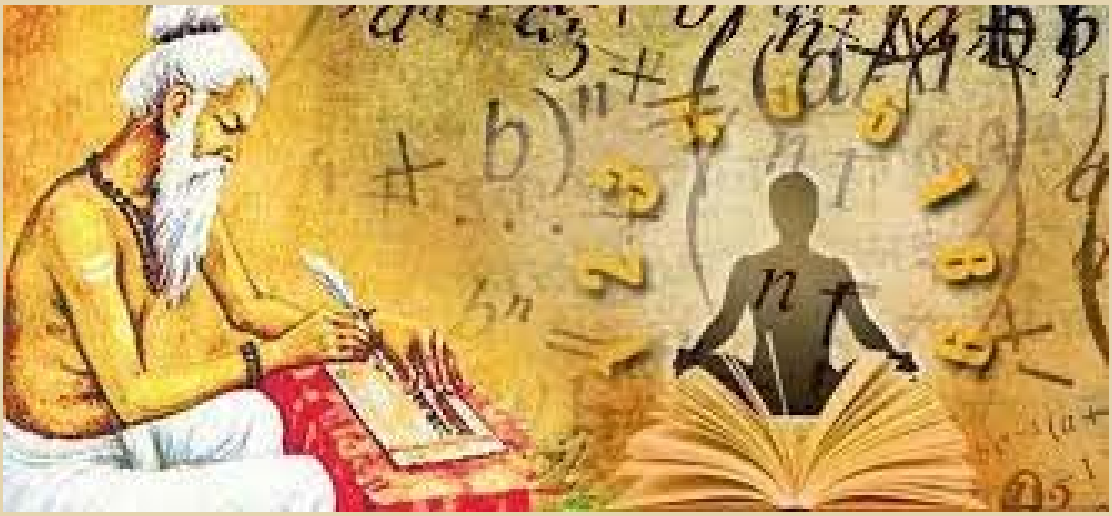
"An unexamined life is not worth living."- Socrates

Dr. Lakhveer Kaur
Assistant Professor

गणित प्रकृति की भाषा है

गणित प्रकृति की भाषा है,
गढ़ती नव नव परिभाषा है,
कल्पना जगत की आशा है,
उन्नति की परिभाषा है,
आनंद की अभिलाषा है,
गणित प्रकृति की भाषा है।
नवोन्मेष की आशा है,
नवाचार की भाषा है,
विकास की परिभाषा है,
शिक्षा नीति की आशा है,
गणित प्रकृति की भाषा है।
नव तकनीकों की अभिलाषा है,
बुद्धिमता की परिभाषा है,
आविष्कारों की भाषा है,
संचार जगत की आशा है,
गणित प्रकृति की भाषा है।
जीवन की नव आशा है,
बहुआयामी विकास की भाषा है,
विकसित राष्ट्र की अभिलाषा है,
गढ़ती नित नव परिभाषा है,
गणित प्रकृति की भाषा है।

डॉ भगवती प्रसाद चमोला
प्रोफ़ेसर



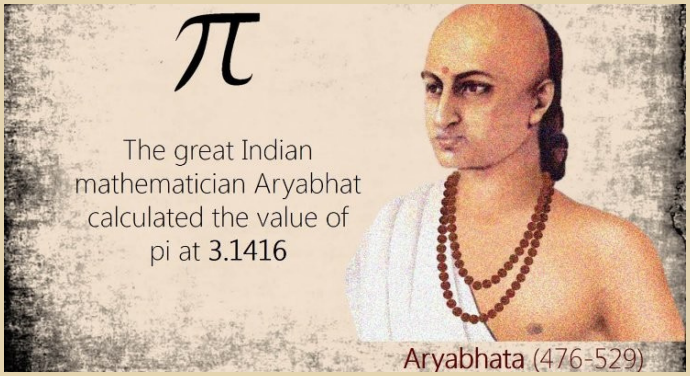
History of Indian Mathematics: A Brief Note

The root of Indian mathematics has its allegiance to Vedic Literature. Many different concepts like the postulations of number system, the concept of zero, methods for finding squares of numbers, short tricks for finding cube roots and square roots, many concepts and algorithms of algebra and trigonometry etc were put forth by Indian mathematicians along with several expositions on mathematics during the span of 1000 B.C. and 1800 A.D. But, it has been found that these contributions were never acknowledged properly. The credit has been given to other scholars or the contributions have been ignored. The credit has been taken by Europeans. This theory had been propagated by the European scholars that these knowledge the Indian scholars is not their original, but it had been acquired from the expertise from the Greek scholars. Reality is that the Greeks have purloined many important theorems and concepts from the Indians, who were much advanced from others. Today's Mathematicians must be indebted to Indian mathematicians for great contribution from centuries. These contributions can't be masked under the garb of neglect by some Eurocentric historians.

"India was the motherland of our race and Sanskrit the mother of Europe's languages India was the mother of our philosophy of much of our mathematics, of the ideas embodied in Christianity of self-government and democracy in many ways, mother India is the mother of us all"

– Will Durant, American historian (1885-1981).

Dr. Vipin Chandra Dubey
Assistant Professor



Penned by the Students

Women in Mathematics

Mathematics comes from the Greek word 'mathema' which means knowledge, learning. It deals with the study of quantity, structure, space, and analysis. It is the backbone of all sciences. It is not just a subject, but the foundation of all-natural phenomena. Humans have excelled in discovering the hidden truths of life through mathematics. It comes in handy for understanding natural sciences, engineering, medicine, finance, social science, etc. Applied mathematics is mother of entirely new mathematical disciplines such as statistics and game theory. Women have proved themselves to be worthy of mathematics in every era. Here are some honorable mentions:

T.A. Saraswati Amma was a scholar born in Cherpulassery, Palakkad district, Kerela. Her notable works are on the Geometry of ancient and medieval India.

Urmila Balavant Apte is a maths lecturer and the founder of Bhartiya Stree Shakti in 1988, which aims at women empowerment. She received the Nari Shakti Puruskar in 2018.

Vasanti N. Bhat-Nayak, a mathematician from University of Bombay. Her research was in the field of balanced incomplete block designs, graceful graphs, bivariegated graphs, graph equations, and frequency partitions.

Ushadevi Narendra Bhosle, an Indian mathematician, educator, and researcher. She has done specialization in Algebraic geometry. Her research work is on moduli spaces of bundles.

Shakuntala Devi is commonly known as the human-computer. Without any formal education in the field of mathematics, she earned a place for herself in 1982 edition of "The Guinness Book of World Records".

Radha Kessar, an Indian mathematician well known for research in the representation theory of finite groups. Presently, she is a professor of mathematics at City, University of London. She is proud recipient of the Berwick Prize of the London Mathematical Society back in 2009.

Sujatha Ramdorai, an algebraic number theorist well known for her work in Iwasawa theory. Currently working as a professor of mathematics at University of British Columbia, Canada.

The above-mentioned names are some among thousands of women who have inspired us to walk confidently, towards the future, unraveling the secrets, mathematics has hidden in its womb. These women have taught us that even a small step, taken with faith can lead us from shadows of uncertainties towards the light of profound understanding.

Shipra Vatsa
MSc (Maths)

Importance of Learning Mathematics

In 1980, the educators had to face difficulties for the 'basic of mathematics', which gave birth to 'new mathematics'. At this time, there was increasing interest in mathematics as a focus of problem solving in mathematics education. Many eminent psychologists, mathematics educators were focused on how children could learn mathematics well. Because mathematics is very important for our life, learning mathematics from basic is as important for us as the other subjects. Students should study mathematics to solve problems, collect data, count data etc. It enables the students to think creatively, logically, and critically. Everyone believes that learning mathematics is very difficult, some people believes that mathematics is very important and some people believes that mathematics is not necessary. Mathematics is important for these reasons:

- Mathematics is everywhere
- Mathematics is a way of thinking
- Mathematics is a way of knowing
- Mathematics is a way to improve creative medium
- Mathematics is a tool for thought

Mathematics is the mother of all science. Nothing is possible without the knowledge of mathematics. It matters to me and other students.

"Pure mathematics is, in its way, the poetry of logical ideas."
– Albert Einstein

Km. Ritu
Ph.D. Scholar

Health and Wellness

A healthy lifestyle starts with good mental health. Most people use these two terms health and wellness together but these two are quite different concepts. According to WHO health is a state of absolute physical, mental and social well-being while wellness is a "positive approach to living". Wellness is more than physical health. Wellness depends on six factors that include physical, intellectual, emotional, environmental, spiritual wellness.

In these tough times, with corona virus spinning on our heads like a time bomb we seriously need to focus on not just physical fitness but our total well being.

The main dimensions of wellness are listed below:

- PHYSICAL: Physical wellness means performing exercises daily. Exercises play a critical role in mental health and keeps the body healthy. Our physical wellbeing was one of the major aspects of our life which was affected by COVID19 which was followed by lockdown.
- MENTAL: Mental exercise and IQ problem solving and creativity improve intellectual wellness and building a positive attitude. However in times of pandemic, being at home all the time led to anxiety and depression issues with a lot of people especially students.
- EMOTIONAL: Nowadays stress is becoming the best friend of humans. So dealing with stress can be termed as emotional wellness. Losing our loved ones to COVID19 had a really big impact on our lives.
- ENVIRONMENTAL: A good environment leads to a healthy lifestyle. An environment free from pollution, dust, and any other hazards can lead to wellness. Covid19 has lead to increase in production of goods such as masks and sanitizers whose disposal is now a new kind of environmental issue.
- SOCIAL: Social circles, friends, and family are valuable for the well-being of a person. Interaction with friends and family can lead to social wellness. Establishing good relations with society and community makes a person happier and healthier. With almost a year of lockdown, students and position holders in offices working from home there has been a negative impact on social relations between people.
- SPIRITUAL: Spiritual wellness means developing compassion, forgiving, caring, and have a purpose in life to help others. Meditation, volunteer work, spending time with nature, etc. helps in spiritual wellness. With COVID 19 at hand, we need to focus on this aspect as well.

"A life without health is like a fish without water"

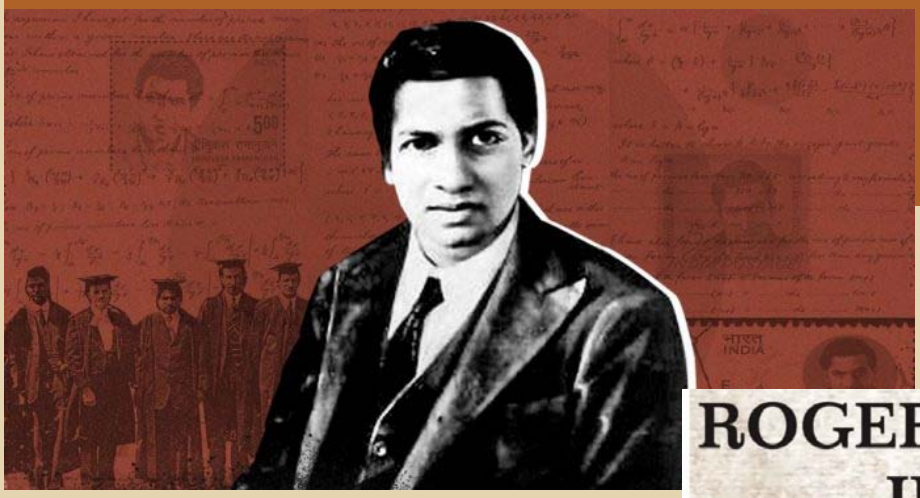
Sakshi Singh
MSc (Maths)
2nd Year

Contribution of Srinivasa Ramanujan in Mathematics

The magnificent contribution of genius S. Ramanujan (1887-1920) in the field of mathematics was accredited only retrospectively. Before departing from this world at the very young age of thirty two years, he contributed extraordinarily to the subject mathematics which can be achieved by a very few in their lifetime, may be long. He started evolving mathematical theories of own and his maiden research paper was published in 1911. As a matter of fact, in 1918, Royal Society fellowship which was the league of world's most esteemed and renowned scientists conferred him with prestigious fellowship. He was only the second Indian to get such honour. He made expansive contribution in the field of number theory in mathematics and this was greatly was ameliorated with his congenital research. We celebrate **December 22** as **National Mathematics Day** every year, which is Srinivasa Ramanujan's birth anniversary, a day for his remembrance. Srinivasa has been acclaimed as one of the apex contemporary mathematicians of his time. It is an astonishing fact that he never had any conventional training in mathematics. He discovered most of his theories derived from declivitous intuition which were established to be correct after long time. He was mentored him at Cambridge by an eminent British Mathematician G. H. Hardy, who motivated Ramanujan to publish his outcomes in several research papers. The disease of tuberculosis ended life of Ramanujan at the age of 32, however he has left behind an inheritance that endures to exhilarate mathematicians till present time not only in India but all over the world. Some contributions of Ramanujan in the field of mathematics are given below:

- More than three thousand deductions containing various identities and mathematical equations were accumulated by Srinivasa. Various algorithms being used in present era are based on pi-infinite series which is considered as a milestone invention by him.
- He also described many interesting properties of the number 1729 which also is known as the Ramanujan number.
- He contributed in a variety of areas of such as number theory, infinite series, the elliptic integrals, hypergeometric series, continued fractions, complex analysis and so on.

Ajay Kumar Agrawal
Ph.D. Scholar



ROGERS-RAMANUJAN IDENTITIES

$$\sum_{n=0}^{\infty} \frac{q^{n^2}}{(q;q)_n} = \prod_{n=1}^{\infty} \left(1-q^{5n-1}\right)^{-1} \left(1-q^{5n-4}\right)^{-1}$$

$$\sum_{n=0}^{\infty} \frac{q^{n^2+n}}{(q;q)_n} = \prod_{n=1}^{\infty} \left(1-q^{5n-2}\right)^{-1} \left(1-q^{5n-3}\right)^{-1}$$

Brain Exercises

SUDOKU

5		9	4					
		3				6	9	
	1							5
	5		1	8				
3				5				7
				9	6		5	
9							7	
	3	8				5		
					7	1		3

Solutions for "Do You Know"

1. Archimedes
2. Madhava of Sangamagrama
3. 1729
4. Srinivasa Ramanujan
5. Times Sign
6. Pythagoras
7. March 14
8. Arithmophobia/Numerophobia
9. Leonhard Euler

DO YOU KNOW?

1. Name the Greek Mathematician killed by Romans during the Syracuse capture.
2. Name the Mathematician who developed Taylor series expansions of Trigonometric Functions.
3. What is Ramanujan-Hardy Number?
4. Who is the Indian prince of Mathematics?
5. Multiplication Sign "X" is also known as_____.
6. "Number rules the Universe" was quoted by _____.
7. Pi Day celebrated on _____.
8. Phobia of Numbers is called _____.
9. Summation Σ was discovered by_____.

5	6	9	4	7	8	2	3	1
4	7	3	5	1	2	6	9	8
8	1	2	3	6	9	7	4	5
2	5	7	1	8	3	9	6	4
3	9	6	2	5	4	8	1	7
1	8	4	7	9	6	3	5	2
9	2	1	8	3	5	4	7	6
7	3	8	6	4	1	5	2	9
6	4	5	9	2	7	1	8	3

Solution for Sudoku

Editorial Team

Prof. Alka Tripathi
(HOD, Mathematics)

Dr. Yogesh Gupta
(Editor)

Dr. Shikha Pandey
(Editor)

Sakshi Singh
(MSc. Maths 2nd yr)

Argaja Mishra
(MSc. Maths 2nd yr)

Shipra Vatsa
(MSc. Maths 2nd yr)

Rhema Simon
(MSc. Maths 2nd yr)

Scan for the Feedback Form