



March 2023 | Issue - I

October 2022 - February 2023

DEPARTMENT OF MATHEMATICS AND HUMANITIES



DoMH, SVNIT, SURAT NEWSLETTER

Welcome

Message from Head of the Department



Greetings

I am very excited to release the first issue of the 2023 newsletter on March 14, which is celebrated as International Mathematics Day all over the world.

Following the directives of the theme of 2023, "Mathematics for Everyone," I would like to encourage researchers and students to pursue research with passion and enthusiasm in order to create societies free of discrimination and borders, reaching out to people and conveying your research to them and making them understand the universality of mathematics. Research cannot be constrained by certain established boundaries. Mathematicians have been working together for much longer than current globalisation trends. I believe that by uniting individuals via mathematical study, we may achieve our bigger goals in life.

I would like to congratulate the whole team for their continued dedication in bringing out this edition of the newsletter, which also commemorates the newsletter's first anniversary.

Best Wishes Dr. Jayesh M. Dhodiya

Message from Faculty Co-ordinator



Greetings

I am delighted to acknowledge that the newsletter, which appears to have begun rather recently, has already reached its first anniversary.

In contemporary culture, education plays a crucial role in assisting humanity in achieving enlightenment and continues to provide us with a new and unique worldview to attain peace.

Peace in the world can be achieved when there is unity. As India acknowledges the presidency of the G20, I think mathematical concepts can unite the world, resulting in "Vasudhaiva Kutumbakam."

I urge that we work on real-world problems that can have a huge impact on the environment, which has been of utmost concern with regard to future generations.

Best wishes Dr. Saroj R. Yadav

About Department



Vision

To be a model for excellence in educational research in Mathematics and Humanities in order to meet the changing needs of society.

Mission

To become an exemplary Centre of Excellence for research and training in the Mathematical Sciences and Humanities by promoting learning, growth and development of young minds and finding solutions to scientific, technological and real-life problems.

In 2021, the Department of Mathematics & Humanities received its current status. Since 2009, it has been Applied Mathematics & Humanities Department, and before that, it was part of the Applied Sciences and Humanities Department. Through out these years, the department has evolved into one of the epicenters of research in India. Since 2007, the department has been offering its own 5 years Integrated M.Sc. Degree Program in Mathematics, in which students are enrolled through Joint Entrance Examination (JEE Mains). The department offers courses in Mathematics, English, and Management to undergraduate and postgraduate students in Engineering and other Science courses. A number of alumni from this department have attained prestigious positions in teaching and research in India and abroad.

The department has highly qualified faculty members including three Professors, three Associate Professors, and twelve Assistant Professors, who have extensive expertise in Fluid Mechanics, Special functions, Algebra, Integral Transforms, Approximation theory, Mathematical modeling, Magnetic fluid dynamics, Bio mathematics, Data Mining, Finite element modeling, Techno innovation to Techno Entrepreneurship General Management, Entrepreneurship, Marketing, Postmodern Fiction, and Indian English fiction.

More than 283+ students have enrolled in the department for Five Years Integrated M.Sc., and 90 Ph.D. students are presently pursuing research. In total, 758+ papers have been published by the Department in the reputed SCI/SCIE and Scopus indexed journals. During the last five years, the department has published 117 H index papers and 109 i10 index papers. A total of INR 2,11,00,000/- worth of projects have been carried out by the department in the last five years funded by different agencies such as Department of Science and Technology (DST), NBHM, ISRO and GUJCOST. So far, the department has produced 99+ Ph.D. students specializing in Mathematics, Management, and English and the department has a good placement record as well.

Prof. Ajay Kumar Shukla

- 1. Member of Executive council of Society of Special Functions and Their Applications.
- 2. Elected Member of Executive Council of Indian Mathematical Society w.e.f. 01.04.2022 for three years.
- 3. Executive Member Council of International Academy of Physical Sciences (IAPS), Prayagraj for the year of 2022-23.

Prof. V. H. Pradhan

- 1. Invited as an Expert for an Interview of Associate Professor-Mathematics at IITE, Gandhinagar on 01/01/2023.
- Invited as VC Nominee subject Expert in the DRC committee for evaluation of first research progress seminar, Department of Applied Mathematics, MSU Baroda on 02/02/2023.
- 3. Invited as an Expert as a panel member for Ph.D admission(GTU) for academic year 2022-23 for the candidates in Science-Mathematics discipline on 30/12/2022.

Dr. Jayesh M Dhodiya

Dr. Jayesh M. Dhodiya has chaired the paper presentation session in international conference in FAMP 2022 organized by Department of Physics, Sardar Vallabbhai National Institute of Technology, Surat.

Dr. Sudeep Singh Sanga

Dr. Sudeep Singh Sanga attended All India Inter NIT Chess Tournament held at NIT Hamirpur during 17-19 December 2022 and won 4 out of 5 matches.

Bhagya Shree Meena

Bhagya Shree Meena recieved Best Paper Presentation Award for a presentation entitled "Numerical Study of 2D Space-Time Fractional Single Phase Lag Bio-heat Model in Irregular domain during Hyperthermia" on National Mathematics Day which was organized by SVNIT Surat during December 22-23, 2022.

Dhruvi Nakrani

Dhruvi Nakrani has cleared Gujarat State Eligibility Test(GSET 2022) for Assistant professor.

Ishika Sanghavi

Ishika Sanghavi received the 'Best Conference Paper Award' at 6th IEEE Eurasian Conference on Educational Innovation 2023 which was held at Singapore University of Social Sciences, Singapore.

Expert Lectures delivered

- 1. Prof. Ajay Kumar Shukla delivered a talk on "Some Generalization of Mittag-Leffler Function" at 2nd (hybrid) International conference on Orthogonal Polynomials, Special Functions and Computer Algebra: Applications in Engineering (OPSFA-2022) organized by Anand International College of Engineering, Jaipur, India supported by UNINETTUNO, Italy, during October 15-16, 2022.
- 2. Prof. Ajay Kumar Shukla delivered a talk on "Generalizations of Laguerre Polynomials and Laguerre Transforms" at International Conference on Special Functions and Their Applications (XXI ICSFA-2022) organized by Department of Studies in Mathematics, University of Mysore, Mysuru (Karnataka), India during November 26-28, 2022.
- Prof. Ajay Kumar Shukla delivered a talk on "Recent Development in Hypergeometric Functions" at International Conference of International Academy of Physical Sciences (CONIAPS XXVIII) on Innovations in Computational and Physical Sciences for Sustainable Development (ICPSSD 2022) organized by Vijaynagara Sri Krishanadevaray University, Ballari (Karnataka), India during December 21-23, 2022.

Dr. Sushil Kumar has delivered a talk entitled "An Introduction to collocation methods and its applications to solve differential equations" in AICTE Training And Learning (ATAL) Academy Hybrid Elementary FDP on "MATHEMATICAL MODELING OF DIFFERENTIALLY ROTATING STARS IN STELLAR SYSTEM " from 31/10/2022 to 11/11/2022 at GRAPHIC ERA DEEMED TO BE UNI-VERSITY, Dehradun, Utarakhand.

Dr. Ranjan Kumar Jana has delivered two invited talks on 09.01.2023 entitled 1. "Techniques of Operations Research: An Overview"

2. "Optimization Techniques for Public Bicycle Sharing System: A case study for Surat city" at 5-Day International Workshop on Optimization Techniques in Industrial and Engineering Applications (IWOTIEA 2023) organized by Department of Mathematics, School of Advanced Sciences, VIT-AP University, Andhra Pradesh, India during January 6-10, 2023.

Placement Statistics (November 2022 - February 2023)



Anusree C B Federal Bank



Kanak Sethi Tata Elxsi



Ankit Bhatia Allen



Chennuru Venkata Sai Teja Tata Elxsi



Singarapu Varun AAKASH BYJUS



Ankit Jaiswal Allen



Harsh Chauhan Tata Elxsi



Nakrani Dhruvi AAKASH BYJUS



Aditya Desai PP Savani

STTP on Python Programming for Students, Engineers & Researchers

STTP on Python Programming for Students, Engineers & Researchers was organized by Prof. V. H. Pradhan (Chairman) and co-ordinators Dr. Jayesh M. Dhodiya, and Dr. Saroj R. Yadav during 26-30 December, 2022.

Python is a widely used high-level, general purpose, interpreted, dynamic programming language. Python works as a simple programming language for beginners, but more importantly, it also works great in scientific simulations and data analysis. This training program on Python programming language aimed to show how clean language design, ease of extensibility, and the great wealth of open source libraries for scientific computing and data visualization are driving Python to become a standard tool for the programming scientist.

This training program was targeted at Master's students, Doctoral students, Post-docs, Faculties, Engineers, and Researchers from all areas of science. In these five days, first two days aimed to introductory sessions followed by a selection of advanced programming techniques and best practices which are standard in the industry, but especially tailored to the needs of a students, faculties, engineers and scientist. Lectures were devised to be interactive and to give enough time to acquire direct hands-on experience with the materials.





The target of this training program on Python programming was to show how clean language design, ease of extensibility, and the great wealth of open source libraries for scientific computing and data visualization are available for scientific simulations and data analysis, etc. In this regard, expected outcomes are Knowledge of basics of Python Programming, Mathematical libraries, Visualization, Stats libraries in Python, PDE solving using python, Machine Learning in Python, and Applications of Python in scientific research and industry.

National Mathematics Day

On December 22-23, 2022, the Department of Mathematics and Humanities organized National Mathematics Day 2022 to commemorate the birthday of great Indian mathematician Srinivasa Ramanujan.

On December 22, the programme was inaugurated at 10:00 by Col. Dimplekumar N. Chalishajar, Virginia Military Institute, USA, and Prof. Anupam Shukla, Director, SVNIT Surat. Prof. Shukla has given the inaugural address, where he urged the students to pursue quality research and he described Ramanujan's contribution to research. He has encouraged the organizing committee to make the event an international event in the near future. The plenary talk was given by Prof. Chalishajar, in which he said Ramanujan's insight into the relationship between mathematics and God, has driven him far further than he ever imagined. Dr. Jayesh M. Dhodiya, HoD, addressed the gathering about the department's recent activities as well as future plans.



The inaugural ceremony came to an end, and refreshments were provided. The programme continued, and the events began at 11:00. Before Day 1, On December 21, M.Sc. Pre events (online) were organized. The first rounds of the Math up event, Flowing in X-Y event, were organized from 9:00 to 10:50 and 11:00 to 11:50 respectively. Then the Hex tournament was successfully completed from 16:00 to 17:50.



The M.Sc. (online) events were continued and Ph.D. (offline) events started from 11:00 on Day 1. The paper presentations in both online and offline mode were successfully completed from 11:00 to 12:20. The second round of Flowing in X-Y concluded the event organized from 12:30 to 13:10. At 14:00, the first round (online) of Physical Sciences Based Modeling was organized. From 16:00 to 16:50, the first round (online) of Integration Bee was conducted. Then the event, Risk, Riddle, Rule commenced at 17:00 and concluded by 18:50. In offline mode, the events, Poster Presentation, Spell-A-thon, Magic Squares, Cross Math were organized successfully from 14:00 to 17:50. The first day came to an end.

On December 23, the day began at 8:30 with various events. In the morning session, the offline events, Communication Gap, Bizz Quiz, Quiz Hunt were successfully organized from 9:00 to 12:30. The online events, Integration Bee (round 2), Quiz, Math Up (round 2) were organized simultaneously. After a lunch break, in the afternoon session, Decipher in online mode and Pictionary in offline mode were organized from 14:00 to 16:00.

To have some fun among the team, at 17:00, a small musical chair event was organized, during which everyone was praised for their dedication to the fact that they had worked hard all day. Further, Prof. Chalishajar has joined the event and enjoyed reliving his childhood memories.

The valedictory ceremony began at 18:00. Dr. Dhodiya has appreciated the team and mentioned the ongoing activities and various initiatives that were started in the department. Prof. Chalishajar has congratulated the whole team for putting a lot of efforts into organizing such a wonderful program. Prof. Pradhan has congratulated the team for their dedicated, persistent hard work. The vote of thanks was delivered by Sai Charan Gannamaneni. After singing the National Anthem, the event ended at 19:00.



Group Discussion Sessions

The Department of Mathematics and Humanities has initiated Group Discussion session during August 2022. The intent of the sessions is to make students think, analyse critically, and provide their opinions within a stipulated time. The following is a list of sessions that were conducted during the foregoing timeline.

Date	Торіс	
12/01/2023	Online Education System	
19/01/2023	Influence of other countries on India	
02/02/2023	Indian Democracy Good or Bad?	
09/02/2023	National Education Policy, 2020	
23/02/2023	Speech of Savajibhai Dholakiya	

IntERAct Seminar

Internship Experience and Research Activities Seminar which is abbreviated as IntERAct Seminar was started by Dr. R. K. Jana in 2017 with the help of a few final year students. The following is a list of sessions that were conducted during the foregoing timeline.

Date	Торіс	Speaker (s)
10/02/2023	Remote Sensing Data Analysis using Python	Mansi Shah and Nishant
17/02/2023	An Introduction to Artificial Intelligence	Praveen Kumar
24/02/2023	Is Math Complete?	Gumma Surya Vamsi

Ph.D. Entrants (Spring 2022)



Publications

Vinod K Jatav and A. K. Shukla (2022). On Matrix Polynomials $L_n^{(M,\delta,\lambda)}(x)$, Filomat 36(15), 5059-5072.

Farhatbanu H. Patel, R. K. Jana, A. K. Shukla (2023). Generalized Bessel Matrix Functions, Georgian Mathematical Journal, https://doi.org/10.1515/gmj-2023-2003.

Bagdi H., Bulsara H. P. (2023). Understanding the role of perceived enjoyment, self-efficacy and system accessibility: digital natives' online learning intentions, Journal of Applied Research in Higher Education.

Rakesh Kumar Meena and Sushil Kumar, Solution of the Fractional Order SIR Epidemic Model Using Residual Power Series Method, Palestine Journal of Mathematics, Vol.11(3), 12-24, 2022.

Bhagya Shree Meena and Sushil Kumar. Computational study on 2D space-time fractional single-phase-lag bioheat model using RBF and Chebyshev polynomial based space-time collocation method. Waves in Random and Complex Media.

Bhagya Shree Meena, Sushil Kumar. Temperature response in skin tissue during hyperthermia based on three-phase-lag bioheat model using RBF meshfree method, Numerical Heat Transfer, Part A: Applications, https://doi.org/10.1080/10407782.2023.218236.

Rupali Gupta, Sushil Kumar. Space-time pseudospectral method for the variable-order space-time fractional diffusion equation, Mathematical Sciences https://doi.org/10.1007/s40096-023-00510-7.

Agnihotri, S., Dhodiya, J.M. Non-dominated sorting genetic algorithm III with stochastic matrix-based population to solve multi-objective solid transportation problem. Soft Computing (2022) (SCIE), https://doi.org/10.1007/s00500-022-07646-z.

Kaushal, Urvashi and Tripathi, P. (2022). Women Breaking the Silence over Violence: Revising Historiography through Sorayya Khan's Novels. Interdisciplinary Literary Studies: A Journal of Criticism and Theory, Vol. 25, No. 1, 2023. pp-1-26. SCI- Q4 journal.

Anila A. Pillai and U. Kaushal. "Duryodhana, 'the leader': traced beyond 'the known'" Int. J. Indian Culture and Business Management, (Indexed in Web of science, ESCI) Vol. 27, No. 3, pp 317–335 • November 3, 2022 https://doi.org/10.1504/IJICBM.2022.126959

Jyoti Yadav and Twinkle Singh, "An approximate analytical Approach of water transport in an unsaturated porous medium by modify Variational Iteration Methods", In Rahul Srivastava and Aditya Kr. Singh Pundir(eds), New Frontiers in Communication and Intelligent Systems, SCRS, India, 2023, pp. 741-761. A. Mondal, D. K. Jana and R. K. Jana, Competition of Forward and Reverse supply chain for selling two substitutable products: novel game theory approach, Operations Research Forum, 3:66, 2022, pp. 1–34, https://doi.org/10.1007/s43069-022-00175-3.

Sartanpara P. P., Meher R., Solution of generalised fuzzy fractional Kaup–Kupershmidt equation using a robust multi parametric approach and a novel transform, Mathematics and Computers in Simulation. 2023; 205 : 939-969.

V. J. Prajapati and R. Meher. A robust analytical approach to the generalized Burgers– Fisher equation with fractional derivatives including singular and non-singular kernels, Journal of Ocean Engineering and Sciences, (2022). (SCI IF:4.803) (Elsevier) https://doi.org/10.1016/j.joes.2022.06.035. (Quartile: Q2)

V. J. Prajapati and R. Meher. Solution of Time-Fractional Rosenau-Hyman Model Using a Robust Homotopy Approach via Formable Transform, Iranian Journal of Science and Technology, Transactions A: Science, (2022) (SCI IF: 1.553) (Springer) https://doi.org/10.1007/s40995-022-01347-w. (Quartile: Q2)

Pokharna, N., Tripathi, I. P. (2023). Optimality and duality for E-minimax fractional programming: application to multiobjective optimization, Journal of Applied Mathematics and Computing, 1-28.

Sachin Devaiya, Shailesh Kumar Srivastava. Several Results on -Strong Convergence of Numerical Sequences and Fourier Series, Acta Mathematica Hungarica (Springer publications), (Q2, SCI, IF: 0.979).

Jayesh Savaliya, Dhananjay Gopal, Shailesh Kumar Srivastava. Some discussion on generalizations of metric spaces in fixed point perspective, International Journal of Nonlinear Analysis and Applications, Vol. 14 (1), 1891-1901, 2023, doi.org/10.22075/ijnaa.2022.26019.3192

Conference Publications/Presentations

Yogesh M.Thakkar and Ajay K. Shukla. Generalization of ${}_{p}R_{q}(\nu, \tau; z)$ Function at International Conference on Special Functions and Their Applications (XXI ICSFA 2022) organized by Department of Studies in Mathematics, University of Mysore, Mysuru (Karnataka), India during November 26–28, 2022.

Dr. Jayesh M. Dhodiya and Aaishwarya Bajaj. Solution of Fuzzy Multi-Objective Solid Travelling Salesman Problem by Aspiration Level Based Multi Objective Quasi Oppositional Jaya Algorithm at Annual International Conference on Significance of Statistical Sciences in Emerging Scenario (SSSES 2023) organized by Department of Statistics, University of Jammu, Jammu (J & K) in conjunction with 25th Annual Conference of the Society of Statistics, Computer and Applications during February 15-17, 2023.

Yadav J., Singh. T., An approximate analytical approach for immiscible process in the porous medium with inclination impact. In Conference Proceeding of Science and Technology, vol5, no. 1, pp.99-105, 2022.

Bhavin M. Rachhadiya and Twinkle R. Singh. Generalized Hermite–Hadamard-type inequalities for s-convex differentiable functions via Caputo–Fabrizio fractional operator, Proceedings of the CONIAPS XXVII International Conference 2021, De Gruyter Proceedings in Mathematics.

Akshay and Twinkle Singh. A Novel Analytical Iterative Approach to Time Fractional Vibration Equation Using Aboodh Transform presented in "International Conference on Nonlinear Analysis and Application -2022 (ICNAA-2022)" held in Assam Don Bosco University, Sonapur, Assam on 22-23 November, 2022.

Akshay and Twinkle Singh. Approximate analytical solution of the time-fractional reactiondiffusion convection equation using Aboodh Transform Iterative Method presented in "International Conference on Mathematics and Computing (ICMC-23)" held in BITS Goa.

Yadav J., Singh. T., "Application of elzaki transform with variational iteration method to nonlinear partial partial differential equations" is presented in International conference on nonlinear analysis and application (ICNAA 2022) held on 22-23 November at Assam Don Bosco University, Sonapur, Assam.

Archana C. Varsoliwala and Twinkle R. Singh, "Solution of Discontinued Problems Arising in Nanotechnology by Elzaki Adomian Decomposition Method", Vol 6 No. 10, Nov 2022, ISSN 2455-4655, [International Conference on Physical Education and Sport Sciences, Date 13 November 2022, Jabalpur, M.P., India.]

Urvashi Kaushal, Parul Pandey. "Researcher Development: Past Present and Future" at 2nd ANNUAL INTERNATIONAL RESEARCH CONFERENCE AND DOCTORAL WORKSHOP organized by Indian Institute of Management Lucknow, Noida Campus during 07 - 11 December, 2022.

Indira P. Tripathi. "On Optimality and duality in interval-valued variational problem with B-(p,r)-invexity" in the International Conference on "Optimization, Learning and Analytics in Business (OLAB 2022)" during Dec 15-17, 2022.

Sachin Devaiya, Shailesh Kumar Srivastava, "Uniform Approximation of Functions Belonging to -Space Using -Means of Fourier-Laguerre Series," Book Title: Frontiers in Industrial and Applied Mathematics, Springer Proceedings in Mathematics & Statistics (Book Series Published by Springer, Singapore), Vol. 410, 155-169, 2023 https://doi.org/10.1007/978-981-19-7272-0_12

Shailesh Kumar Srivastava, Sachin Devaiya. "Degree (Error) of approximation of functions using -means of its Fourier-Laguerre series," Proceedings of the 5th International Conference on Frontiers in Industrial and Applied Mathematics (FIAM 2022), held at Central University of Haryana, India, during December 21-22, 2022 (Accepted for publication in Springer Proceedings in Mathematics & Statistics).

Sudeep Singh Sanga. "Control F-policy for Machine Repair Model with General" at the 9th International Conference on Mathematics and Computing organized by BITS Pilani Goa Campus, Goa, India, during January 06-08, 2023. Nagesh Sahu and Saroj R Yadav. "Generalised G'/G-expansion method for solution of porous medium equation" at 8th International Conference on Mathematics and Computing ICMC 2023 organized by BITS Pilani K. K. Birla Goa Campus, Goa, India during January 6-8, 2023.

Book Chapter Publications

Ankit Pal, Rachana Desai, R.K.Jana and A.K.Shukla(2022): A Survey on ${}_{p}R_{q}(\alpha, \beta; z)$ Function and its Applications, Book Chapter in Recent Advances in Mathematical Analysis and their applications, Department of Mathematics, University of Kerala, Thiruvanthapuram (Kerala),India, 19–54.

"Comparison of Numerical solution of consolidated equation in one dimension by Finite Difference Methods & Finite Element Method with Analytic solution" (Sanjay L. Gosiya, Mansi S.Palav, Vikas H. Pradhan) accepted for AISC Springer Proceeding (Advances in Intelligent systems & computing) (considered in web of science), Vol.1440 as book chapter (Chapter 12).

"Numerical solution of Non-dimensional contaminant Transport Equation with varying coefficients (Temporal) by Haar Wavelet" (Asmita C. Patel, V.H.Pradhan) accepted for AISC Springer Proceeding (Advances in Intelligent systems & computing) (considered in web of science), Vol.1440 as book chapter (Chapter 30).

Sunil B. Bhoi, Jayesh M. Dhodiya, Multi-objective university course scheduling for uncertainly generated courses, CRC Press, Taylor & Francis Group, Vol-1, Page-12, https://doi.org/10.1201/9781003303053

R. Mondal, R. K. Jana, P. Pramanik and M. K. Maiti. A Fuzzy EOQ model for deteriorating items under trade credit policy with unfaithfulness nature of customers, in: L. Sahoo, T. Senapati and R. R. Yager (Eds.), Real Life Applications of Multiple Criteria Decision-Making Techniques in Fuzzy Domain, Springer Nature.

A. Pal, R. Desai, R. K. Jana and A. K. Shukla, A Survey on ${}_{p}R_{q}(\alpha,\beta;z)$ Function and its Applications, Chapter 2, pp. 19-54, In: D. Kumar, Y. Luchko and G. S. Singh (Eds.) Recent Advances in Mathematical Analysis and Applications, University of Kerala, Thiruvananthapuram, 2022. (ISBN: 81-86660-48-8).

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