दिल्ली विश्वविद्यालय
University of Delhi

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/ University of Delhi(Department Annual Report)

Department's 100th Annual Report (1st April 2022 to 31st March 2023): Mathematics

Name of the Department

Mathematics

Name of the Faculty

Mathematical Sciences

Brief History

The Department of Mathematics at the University of Delhi was established in 1947 and ever since its inception, department has always strived to be amongst the best mathematics departments in the country and has worked towards becoming a centre of excellence for advanced research in various areas of Mathematics including Algebra, Analysis, Topology, Differential Equations ,Mathematical Programming. A strong

commitment of the department to excellence in teaching and research has attracted talented students from all over the country The department currently offers M.Sc. and Ph.D. programs in Mathematics. It is dedicated to providing the students with the environment and the infrastructure that helps them to develop the potential for scholarship, creative work, professional realization, and service. The department functions to create individuals with a strong foundation of the subject and their practical attributes Department has been receiving various support and grants including UGC's SAP-DRS, SAP-DSA, DST-FIST and DST-PURSE.

Major Activities and Achievements

The Department of Mathematics QS World ranking 2023 is 251-300 and the QS ranking within Asia is 72 which are improved from 2022. The QS ranking within India is 9th. The Faculty members of the department have Research Projects of approx. Rs. 122 Lacs and have published around 87 Research papers in journals of international repute. Two post doctoral fellows have worked in the department availing prestigious NBHM and UGC Dr. D.S. Kothari fellowships. The Department of Mathematics has received best website award in 2021 in the University of Delhi. The infrastructure of the Department has improved as department Research Scholar Room, Seminar Room and Class Rooms are well equipped with laser projectors, PTZ video conferencing camera etc. Department placement cell organized many webinars and workshops for students to develop skills. Approximately 25 companies visited and selected 45 students with the highest package offered in 2022-23 is 19.5 LPA.

Honours/Distinctions

Ruchi Das addressed as Chief Guest at Valedictory Session of 2nd International Conference on Recent Trends in Mathematical Sciences on 28 th December, 2022, organized by HIMACHAL GANITA PARISHAD.

Ruchi Das addressed as Chief Guest at Valedictory Session in the International Conference on Analysis and its Applications; (ICAA-23) from 27th to 28th of February, 2023 at Shivaji College, University of Delhi.

Ruchi Das addressed as Chief Guest on 22nd March 2023 in the inaugural Session of FDP 96 “Computer Algebra Systems” organized by MAHATMA HANSRAJ FACULTY DEVELOPMENT CENTRE of Hansraj college, University of Delhi.

Ruchi Das appointed as subject expert, Board of studies of Mathematics, H.P.University Shimla for a period of two years from August, 2021.

Ruchi Das is an editorial board member of Asian - European Journal of Mathematics published by World Scientific, Singapore

Ruchi Das is an editorial board member of Journal of Dynamical Systems and Geometric Theories.

Tarun Das served as an expert in selection committees to appoint permanent faculties outside University of Delhi domain.

Tarun Das is University representative of Delhi College of Arts, University of Delhi.

Tarun Das serving as member Academic Council, University of Allahabad, Academic Council, Delhi Technological University, Council for Academic Affairs, NSIT, Board of Studies in Mathematics, Kurukshetra University, Board of Studies in Mathematics, University of Ladakh and Faculty Board, MDU, Rohtak.

Tarun Das also serving as Visiting Professor University of Ladakh.

Tarun Das is member Editorial Board of Ganita.

Sachi Srivastava was Invited Visitor at Department of Mathematics, Newcastle University, Newcastle, UK, hosted by Prof. David Seifert, University of Newcastle in July 2022.

Lalit Kumar is a member of editorial board of Mathematical Journal of Interdisciplinary Sciences. Publisher: Chitkara University, Punjab.

Lalit Kumar is a member of editorial board of International Journal of Wavelets Multiresolution and Information Processing, published by World Scientific, Singapore.

Hemant Singh extended services as Subject Expert for the Appointment of Assistant Professors in Mathematics by State Service Commission, (2022).

Hemant Singh extended services as Subject Expert for the Appointment of Mathematics-TGT by Kendriya Vidyalaya Sangathan, New Delhi (2023).

Publications

(a.) Research Articles

1. Luthra P. & Kumar A. , (2022) , .Operator System Theory: A Survey , .*Mathematics , its Applications and History* , . , . , .8.1-8.20 , .

2. Beniwal S. Kumar A. & Luthra P. , (2022) , Local version of approximation theorem and of λ- tensor product of operator systems , *Advances in Operator Theory* , 1 , 7 , 35 , 0

3. Kumar A. & Sharma J. , (2022) , Uncertainty principles on nilpotent groups , *Khayyam Journal of Mathematics* , 2 , 8 , 143-162 , 0

4. Bansal P. Kumar A. & Bansal A. , (2022) , Continuous Modulated Shearlet Transform , *Advances in Pure and Applied Mathematics* , 4 , 13 , 29-57 , 0

5. Kansal A. Kumar A. & Rajpal V. , (2023) , Inductive limit in the category of C*-ternary rings , *Bull. Korean Math. Soc* , 1 , 60 , 137-148 , 0

6. Beniwal S. & Kumar A. , (2023) , Ternary rings of unbounded operators , *Banach Journal of Mathematical Analysis* , 2 , 17 , - , 0

7. Kansal A. Kumar A. & Rajpal V. , (2023) , Representations of C*-ternary rings , *Comm. Korean Math. Soc.* , 1 , 38 , 123-135 , 0

8. Bansal P. Kumar A. & Bansal A. , (2023) , Uncertainty Inequalities for Certain Connected Lie Groups , *Annals of Functional Analysis* , 3 , 14 , 57 , 0

9. Dutta J. Chandra S. Rimpi & Lalitha C. S. , (2023) , Correction to: Convexifactors, generalized convexity, and optimality condition , *J. Optim. Theory Appl.* , - , 197 , 383-385 , 0

10. Aanchal & Lalitha C.S. , (2023) , Second-order optimality conditions for locally Lipschitz vector optimization problems , *Optimization* , - , = , published online , 0

11. Sharma P.K. & Lalitha C.S. , (2023) , Connectedness of the solution sets in generalized semi infinite set optimization , *Optim. Lett.* , - , 17 , 1575-1594 , 0

12. Karuna and Lalitha C. S. , (2023) , Convergence, scalarization and continuity of minimal solutions in set optimization , *J. Oper. Res. Soc. China* , - , - , Published online , 0

13. Khushboo & Lalitha C. S. , (2023) , Characterizations of set order relations and nonlinear scalarizations via generalized orient-ed distance function in set optimization , *J. Global Optim* , - , 85 , 235-249 , 0

14. Rimpi & Lalitha C.S. , (2023) , Constraint qualifications in terms of convexificators for nonsmooth programming prob-lems with mixed constraints , *Optimization* , 8 , 72 , 2019-2038 , 0

15. Rimpi & Lalitha C.S. , (2022) , Constraint qualifications in nonsmooth optimization: classification and inter-relations , *J. Nonlinear Var. Anal* , 2 , 6 , 83-99 , 0

16. Kumar D. & Das R. , (2023) , 1. Topological equicontinuity and topological uniform rigidity for dynamical system , *Filomat* , 20 , 37 , 6813-6822 , 0

17. Mahajan A. Thakur R. & Das R. , (2023) , 2. Multi-sensitivity with respect to a vector for semiflows defined on Hausdorff uniform spaces , *Semigroup Forum* , 2 , 106 , 444-549 , 0

18. Kumar D. Salman M. & Das R. , (2022) , 3. Topological sensitivity on Hyperspaces , *Bull.Belg.Math.Soc.Simon Stevin* , 1 , 29 , 19-26 , 0

19. Thakur R. & Das. R. , (2022) , 4. On variants of n-sensitivity in semiflows , *Journal of Difference Equations and Applications* , 8 , 28 , 1039-1053 , 0

20. Vashisht R. & Das R. , (2022) , 5. Specification and shadowing properties for non-autonomous systems , *Journal of Dynamical and Control Systems* , - , 28 , 481-492 , 0

21. Khan A.G. & Das T. , (2023) , 1. Topologically stable and persistent points of group actions , *Mathematica Scandinavica* , 1 , 129 , 60-71 , 0

22. Das P.K. &Das T. , (2023) , 2. Mean Ergodic Shadowing , *Bull. Braz. Math. Soc.* , 1 , 54 , 37B65 , 0

23. Khan A.G. & Das T. , (2022) , 3. Stability theorems in pointwise dynamics , *Topology Appl.* , - , 320 , 14 , 0

24. Khan A.G. & Das P. , (2022) , 4. Sequential shadowing implies spectral decomposition, , *Topology Proceedings* , - , 60 , 169-179 , 0

25. Kumar D. & Srivastava S. , (2022) , . Quantum dynamical semigroups and stability , *J. Math. Anal. Appl.* , 1 , 516 , 126492-12 , 0

27. Anand J. & Srivastava S. , (2022) , A Class of Invariant Subspaces of weighted composition operators on Hardy-Hilbert Spaces , *Analysis Mathematica* , - , 48 , 925-937 , 0

28. Jindal D. Jyoti & Vashishth L.K. , (2023) , Matrix-valued nonstationary frames associated with the Weyl-Heisenberg group and extended affine group , *International Journal of Wavelets, Multiresolution and Information Process* , 6 , 21 , 2350022 , 1

29. Sinha U. K. & Vashishth L. K. , (2023) , On matrix-valued Gabor Bessel sequences and dual frames over locally compact abelian groups , *Khayyam Journal of Mathematics* , 1 , 9 , 89-101 , 0

30. Divya & Patel A. , (2022) , On matrix-valued Gabor Bessel sequences and dual frames over locally compact abelian groups , *Physics of Fluids* , - , 34 , 066115 , 0

31. Gaur A. & Kumar R. , (2023) , A question about maximal non-ϕ-chained subrings , *Communications of the Korean Mathematical Society* , 1 , 38 , 11-19 , 0

32. Mishra P. R. Gupta P. & Gaur A. , (2023) , On full differential uniformity of permutations on the ring of integers modulo n , *Applicable Algebra in Engineering, Communication and Computing* , - , 34 , 301-319 , 0

33. Singh H. K. & Singh S. K. , (2022) , Borsuk-Ulam type theorem for multivalued maps , *Hiroshima Math. J.* , 3 , 52 , 321-331 , 0

34. Kumari A. & Singh H.K. , (2022) , Cohomology classification of spaces with free S1 and S3 -actions , *Filomat* , 20 , 36 , 7021-7026 , 0

35. Talwar B. Jain R. , (2022) , Center of Banach algebra valued Beurling algebras , *Bull. Aust. Math. Soc* , 3 , 105 , 490-498 , 0

36. Mohit & Jain R. , (2023) , Birkhoff-James orthogonality in certain tensor products of Banach spaces , *Operators and Matrices* , 1 , 17 , 235-244 , 0

37. Mavi S. & Bishnoi A. , (2022) , Valuation-transcendental extensions and pseudo-monotone sequences , *Communications in Algebra* , 10 , 50 , 4288-4299 , 0

38. Mavi S. & Bishnoi A. , (2023) , Abstract key polynomials and distinguished pairs , *Journal of Algebra and its Applications* , 9 , 22 , 2350193 , 0

39. Mavi S. & Bishnoi A. , (2023) , MacLane-Vaquié chains and valuation-transcendental extensions , *Journal of Commutative Algebra* , - , - , published online , 0

40. Mavi S. & Bishnoi A. , (2023) , Abstract key polynomials and MacLane-Vaquié chains , *International Journal of Algebra and Computation* , 1 , 33 , 15-30 , 0

41. Sharma A. & Rai P. , (2023) , Analysis of a higher order uniformly convergent method for singularly perturbed parabolic delay problems , *Applied Mathematics and Computation* , - , 448 , 127906 , 0

42. Yadav R.P. Rai P. & Sharma K.K. , (2023) , NIPG finite element method for convection-dominated diffusion problems with discontinuous data , , *International Journal of Computational Methods* , 5 , 20 , 2350001 , 0

43. Kumar S. Rai P. & Cetinkaya A. C. , (2023) , Bound on Hankel determinants $H_4^{(2)}(f)$ and $H_4^{(3)}(f)$ for Lemniscate starlike functions , *Honam Math. J.* , 1 , 45 , 92-108 , 0

44. Rai P. Cetinkaya A.C. &Kumar S. , (2023) , Starlike functions associated with $\tanh z$ and Bernardi integral operator , *Mathematical Foundations of Computing* , 3 , 6 , 573-585 , 0

45. Yadav S. & Rai P. , (2023) , A parameter uniform higher order scheme for 2D singularly perturbed parabolic convection–diffusion problem with turning point , *Mathematics and computers in simulation* , - , 205 , 507-531 , 0

46. Sharma A. & Rai P. , (2022) , Uniformly convergent hybrid numerical scheme for singularly perturbed turning point problems with delay , *International Journal of Computer Mathematics* , 5 , 100 , 1052-1077 , 0

47. Yadav S. & Rai P. , (2022) , An almost second order parameter uniform scheme for 2D singularly perturbed boundary turning point problem , *Calcolo* , - , 59 , 44 , 0

48. Yadav R.P. Rai P. & Sharma K.K. , (2022) , Non-symmetric interior penalty Galerkin finite element method for a class of singularly perturbed reaction diffusion problems with discontinuous data , *International Journal of Applied and Computational Mathematics.* , - , 8 , 272 , 0

49. Sharma A. & Rai P. , (2023) , Analysis of a hybrid numerical scheme for singularly perturbed convection-diffusion type delay problems , *International Journal of Computational Methods* , 1 , 20 , 2250032 , 0

50. Gaber A.A. Alsharari F. & Kumar S. , (2022) , Some closed-form solutions, conservation laws, and various solitary waves to the (2 + 1)-D potential B-K equation via Lie symmetry approach , *International Journal of Modern Physics B* , 20 , 36 , 2250117 , 0

51. Abdou M.A. Quahid L. Alshahrani J.S. Alanazi M.M. &Kumar S. , (2022) , New analytical solutions and efficient methodologies for DNA (Double-Chain Model in mathematical biology , *Modern Physics Letters B* , 24 , 36 , 2250124 , 0

52. Kumar s., Mohan B. &Kumar R. , (2022) , soliton, and interaction solutions to a generalized two-mode higher-order nonlinear evolution equation in plasma physics , *Nonlinear Dynamics* , 1 , 110 , 693-704 , 0

53. Kumar S. & Rani S. , (2022) , Study of exact analytical solutions and various wave profiles of a new extended (2+1)-dimensional Boussinesq equation using symmetry analysis , *ournal of Ocean Engineering and Science* , 5 , 7 , 475-484 , 0

54. M. S. Osman, H. Almusawa, K. U. Tariq, S. Anwar, Kumar, S. Younis, M. & Ma W. X. , (2022) , On global behavior for complex soliton solutions of the perturbed nonlinear Schr¨odinger equation in nonlinear optical fibers , *ournal of Ocean Engineering and Science* , 5 , 7 , 431-443 , 0

55. Kumar, S. & Kumar A. , (2022) , A study of nonlinear extended Zakharov-Kuznetsov dynamical equation in (3+1)-dimensions: Abundant closed- form solutions and various dynamical shapes of solitons , *Modern Physics Letters B* , 25 , 36 , 2250140 , 0

56. Kumar, S. & Kumar A. , (2022) , Dynamical behaviors and abundant optical soliton solutions of the cold bosonic atoms in a zig-zag optical lattice model using two integral schemes , *Mathematics and Computers in Simulation* , - , 201 , 254-274 , 0

57. Kumar S. Rani S. & Mann N. , (2022) , Diverse analytical wave solutions and dynamical behaviors of the new (2+1)-dimensional Sakovich equation emerging in fluid dynamics , *European Physical Journal Plus* , 11 , 137 , 1226 , 0

58. Abdou M.A. Quahid L. Alshahrani J.S. Alanazi M.M. Al-Moneef, A. A. & Kumar S. , (2022) , Abundant exact solutions for the deoxyribonucleic acid (DNA) model , *International Journal of Modern Physics B* , 28 , 36 , 2250194 , 0

59. Kumar S. Niwas M. & Dhiman S. K. , (2022) , Abundant analytical soliton solutions and different wave profiles to the Kudryashov-Sinelshchikov equation in mathematical physics , *Journal of Ocean Engineering and Science* , 6 , 7 , 565-577 , 0

60. Kumar s. Niwas M. , (2022) , New optical soliton solutions of Biswas–Arshed equation using the generalised exponential rational

function approach and Kudryashov's simplest equation approach , *Pramana-Journal of Physics* , 4 , 96 , 204 , 0

61. Kumar S. Kumar A. Mustafa Inc, H . Alotaibi, Abdou M. A. & Akgu¨l A. , (2022) , An investigation of (2+1)-dimensional asymmetric Nizhnik–Novikov–Veselov system: Lie symmetry reductions, invariant solutions, dynamical behaviors and conservation laws , *Results in Physics* , - , 43 , 106034 , 0

62. Kumar S. Mohan B. , (2022) , A generalized nonlinear fifth-order KdV-type equation with multiple soliton solutions:Painlev´e analysis and Hirota Bilinear technique , *Physica Scripta* , 12 , 97 , 125214 , 0

63. Kumar S. Kumar A. & Mohan B. , (2023) , Evolutionary dynamics of solitary wave profiles and abundant analytical solutions to a (3+1)-dimensional burgers system in ocean physics and hydro- dynamics , *Journal of Ocean Engineering and Science* , 1 , 8 , 1-14 , 0

64. Kumar, S. Hamid I. , Abdou M. A. , (2023) , Specific wave profiles and closed-form soliton solutions for generalized nonlinear wave equation in (3+1)-dimensions with gas bubbles in hydrody- namics and fluids , *Journal of Ocean Engineering and Science* , 1 , 8 , 91-102 , 0

65. Kumar S. Kumar A. , (2023) , Dynamical behaviors with various exact solutions to a (2 + 1)-dimensional asymmetric Nizhnik-Novikov-Veselov equation using two efficient integral approaches , *International Journal of Modern Physics B* , - , - , 2450064 , 0

66. Kumar S. & Rani S. , (2023) , Invariance analysis for determining the closed-form solutions, optimal system, and various wave profiles for a (2+1)-dimensional weakly coupled B-Type Kadomtsev-Petviashvili equations , *Journal of Ocean Engineering and Science* , 2 , 8 , 133-144 , 0

67. Dhiman S. K. & Kumar S. , (2023) , An optimal system, invariant solutions, conservation laws, and com- plete classification of Lie group symmetries for a generalized (2+1)-dimensional Davey–Stewartson system of equations for the wave propagation in water of finite depth, , *European Physical Journal Plus* , 3 , 138 , 195 , 0

68. Kumar S. & Niwas M. , (2023) , New optical soliton solutions and a variety of dynamical wave profiles to the perturbed Chen–Lee–Liu

equation in optical fibers , *Optical and Quantum Electronics* , 5 , 55 , 418 , 0

69. Kumar S. Nisar K. S. & Niwas M. , (2023) , On the dynamics of exact solutions to a (3+1)- dimensional YTSF equation emerging in shallow sea waves: Lie symmetry analysis and generalized Kudryashov method, , *Results in Physics* , - , 48 , 106432 , 0

70. Alanazi, M.M. Ouahid L. , Al Shahrani J. S. Abdou M. A. & Kuamr S. , (2023) , Novel soliton solutions to the Atangana Baleanu (AB) fractional for ion sound and Langmuir waves (ISALWs) equations , *Optical and Quantum Electronics* , 5 , 55 , 462 , 0

71. El-Ganaini S. & Kumar S. , (2023) , Symbolic computation to construct new soliton solutions and dynamical behaviors of various wave structures for two different extended and generalized nonlinear Schr¨odinger equations using the new improved modified generalized sub-ODE proposed method , *Mathematics and Computers in Simulation* , - , 208 , 28-56 , 0

72. Kumar S. & Niwas M. , (2023) , Abundant soliton solutions and different dynamical behaviors of various waveforms to a new (3+1)-dimensional Schr¨odinger equation in optical fibers , *Optical and Quantum Electronics* , 6 , 55 , 531 , 0

73. I. Kumar, S. & Sharma P. , (2023) , On the Faedo–Galerkin Method for Non-autonomous Nonlinear Differential Systems , *Results Math* , - , 78 , 107 , 0

74. II. Kumar S. & Yadav S. , (2023) , Approximate controllability of stochastic delay differential systems driven by Poisson jumps with instantaneous and noninstantaneous impulses , *Asian J Control* , - , 25 , 4039-4057 , 0

75. Kumar S. , (2022) , On approximate controllability of non-autonomous measure driven systems with non-instantaneous impulse , *Applied Mathematics and Computation* , - , 441 , 127695 , 0

76. Upadhyay A. & Kumar S. , (2023) , The exponential nature and solvability of stochastic multi-term fractional differential inclusions with Clarke’s subdifferential , *Chaos, Solitons & Fractals* , - , 168 , 113202 , 0

77. V. Kumar, S. & Sharma P. , (2022) , Faedo–Galerkin method for impulsive second-order stochastic integro-differential systems , , *Chaos, Solitons & Fractals* , - , 158 , 111946 , 0

78. i. Yadav, S.& Kumar S. , (2023) , Approximate controllability for impulsive stochastic delayed differential inclusions. , *Rend. Circ. Mat. Palermo, II. Ser* , - , published online , - , 0

79. Kumar S. & Yadav S. , (2022) , Approximate controllability for a new class of stochastic functional differential inclusions with infinite delay , *Random Operators and Stochastic Equations* , 3 , 30 , 221-239 , 0

80. Chaudhary B.K. & Singh R. , (2022) , Converging shocks in van der Waals stiffened relaxing gases , *Eur. Phys. J. Plus* , - , 137 , - , 0

81. Kipgen L. & Singh R. , (2022) , Collision of an acceleration wave with blast wave in van der Waals dusty reacting gases , *Physics of Fluids* , - , 34 , 056106 , 0

82. Shah S. Singh R. & Chaudhary B.K. , (2022) , Concentration and cavitation of Riemann solutions to two-phase Chaplygin flows under vanishing pressure and flux approximation , *Communications in Nonlinear Science and Numerical Simulation* , - , 118 , 107065 , 0

83. Kipgen L. & Singh R. , (2023) , δ−shocks and vacuum states in the Riemann problem for isothermal van der Waals dusty gas under the flux approximation , *Physics of Fluids* , - , 35 , 016116 , 0

84. Sharma D. & Singh R. , (2023) , Singular surface for non-ideal two-phase modified Chaplygin flow consisting of source term , *International Journal of Non-Linear Mechanics* , - , 149 , 104312 , 0

85. Gandhi S. Gupta P. Nagpal S. & Ravichandran V. , (2022) , Starlike functions associated with an epicycloid , *Hacet. J. Math. Stat.* , 6 , 51 , 1637-1660 , 0

86. Raj A. & Nagpal S. , (2022) , Radius of convexity for analytic part of sense-preserving harmonic mappings , *Bull. Malays. Math. Sci. Soc* , 5 , 45 , 2665-2679 , 0

87. Kumar V. Nagpal S. & Cho, Nak Eun. , (2022) , Coefficient functionals for non-Bazilevič functions. , *Rev. R. Acad. Cienc. Exactas Fís. Nat. Ser. A Mat.* , 1 , 116 , 44 , 0

(b.) Books/Chapter in Books

1. Kapoor S. and Lalitha C.S. , (2022) , Density Aspects in Semi-Infinite Vector Optimization. Accepted , *Continuous Optimization and Variational Inequalities* , CRC Press (Taylors & Francis) , 9781032267838 , 55-70

2. Gaur A. & Kumar R. , (2022) , A note on FMS modules and FCP Extensions , *Proceedings of Algebra and Related Topics with Applications ICARTA-2019* , International conference on Algebra and Related topics with Applications-2019 , 978-981-19-3897-9 , 143-147

(c.) Journal(s) Published by the Department

1. .,(.) ,. , . , . , . , .

Research Projects

1. DST-SERB(MATRICS scheme), February 2020-February 2023, Quantum Dynamical Semigroups and perturbations., 6.6

2. DST-SERB Core Research Grant, Dec 2020 – Dec 2023, Asymptotics of Solutions of Linear and Non-Linear Delay Differential Equations., 31.78

4. Faculty Research Program Grant, IOE University of Delhi, September 2022- March 2023, Birkhoff-James orthogonality for tensor products of Banach Spaces, 3

5. Faculty Research Program Grant, IOE University of Delhi, September 2022- March 2023, Estimates of close-to-convex, starlike and convex functions, 3

6. DST-SERB POWER Grant, June 2022-June 2025, The Development and Analysis of Finite Element Methods for a class of Singular Perturbation Problems with Discontinuous Data, 22.5

7. Faculty Research Program Grant, IOE University of Delhi, September 2022- March 2023, Qualitative Analysis of Measure Differential Equations in Banach Spaces , 3

8. DST-SERB (EEQ), 2020-2023, Study of Dynamics of Exact Solutions for the Non-linear Evolution Equations using Lie Symmtry Analysis, 20.74

9. IOE University of Delhi, September 2022- March 2023, Dynamic Behavior and Stability of Nonlinear and Fractional-Order Differential Systems With Various Controllers, 3

10. DST-SERB (MATRICS scheme), 2020-23, Lie Symmtry Analysis and Dynamics of Physical Phenomena for Nonlinear Evolution Equations, 6.6

11. Faculty Research Program Grant, IOE University of Delhi, 2022-23, Structure of shock waves in two phase flow under the magnetic field, 2

12. Faculty Research Program Grant, IOE University of Delhi, 2022-23, Frames of Gabor and Wavelet Systems with Several Generators , 2

13. Faculty Research Program Grant, IOE University of Delhi, 2022-23, Dynamic Behavior and Stability of Nonlinear and Fractional-Order Differential Systems With Various Controllers, 3

14. Faculty Research Program Grant, IOE University of Delhi, 2022-23, Birkhoff James orthogonality for certain tensor product of Banach spaces , 3

15. Faculty Research Program Grant, IOE University of Delhi, 2022-23, A generalization of almost integrally closed domains, 3

16. DST-SERB, 2023-2026, Computer Simulationof Mixed Cinvective flows in Triangular and Rectangular Enclosures, 8.8

Patents Filed/Granted

1. - and -

Seminars/Conferences organized by the Department

1. Prof. K. B. Sinha , Professor, JNCASR, Bengaluru, -, Dilation Theory and Trace formula for contractions, 27-04-2023

Seminar/Conference Presentations (National/International) by Faculty Members

1. C.S. Lalitha delivered an invited talk entitled "Second-order Optimality Conditions for Geoffrion Proper Efficient Solutions in Nonsmooth Vector Optimization" at the International Symposium on Applied Optimization and Game Theoretic Models for Decision Making , Indian Statistical Institute, Delhi Centre on February 2, 2023.

2. C.S. Lalitha delivered an invited talk entitled "Some Solved and Unsolved Problems in Mathematics" at Motilal Nehru College, on October 17, 2022.

3. C.S. Lalitha delivered an invited talk entitled "Convex Optimization and Applications, 3rd Conference on Algebra, Analysis and Applications" at Dr. B. R. Ambedkar University Delhi on August 5, 2022

4. C.S. Lalitha delivered an invited talk entitled "Mathematics in Medicine "at the International Webinar on Applied Mathematics, Thia-garajar College, Madurai on April 19, 2022

5. Ruchi Das delivered an invited talk entitled "Sensitivity and Chaos in Nonautonomous Dynamical Systems" at the International Conference on Mathematical Analysis and Applications, NIT Tiruchirappalli during December 15-17,2022

6. Ruchi Das delivered an invited talk entitled " Chaos... from perspective of Nonautonomous Systems" at Symposium on Dynamical Systems, Department of Mathematics, University of Ladakh, Leh on Aug 20, 2022.

7. Ruchi Das delivered an invited talk entitled "Sightseeing Chaos in Non Autonomous systems, 3rd Conference on Algebra and Applications" at School of Liberal Studies, Dr. BR Ambedkar University, Delhi on August 05, 2022.

8. Tarun Das delivered an invited talk entitled "Persistent and expansive dynamical systems .. a reflection" at the International

Conference on Mathematical Analysis and Applications, NIT, Tiruchirappalli during December 15-17, 2022

9. Tarun Das delivered an invited talk entitled " Recurrence in Dynamical systems and beyond" at the International Conference on Recent Trends in Mathematical Theory and Applications (online mode), West Bengal State, University, Kolkata during December 14-15, 2022.

10. Sachi Srivastava delivered an invited talk entitled "New Challenges in Operator Semigroups" at St. John's College Oxford, University of Oxford during 18 -22 July 2022.

11. Sachi Srivastava delivered an invited talk at the International Conference on Analysis and its Applications, Shivaji College University of Delhi during 27-28 February 2023.

12. Sachin Kumar delivered an invited talk entitled "Lie symmetry reductions, analytical solutions, and dynamical behavior of wave profiles for higher-dimensional nonlinear evolutionary equations" at the Department of Mathematics, IIT Indore on September 27, 2022.

13. Sachin Kumar Presented a paper entitled "Lie symmetry reductions with exact solutions and dynamical behaviour of extremely nonlinear (3+1)-dimensional generalized BKP-Boussinesq equation" at International Conference on Applied Engineering, Architecture, Physics, and Mathematical Sciences - DUBAI 2022, Dubai, United Arab Emirates during November 16 - 17, 2022,

14. Sachin Kumar delivered an invited talk entitled " A (2+1)-dimensional nonlinear evolution equation: Lie symmetry reductions, Exact solutions, Dynamics of solitons" at Department of Physics, School of Engineering and Applied Sciences, Bennett University on November 19, 2022.

15. Sachin Kumar delivered an invited talk entitled "Innovative tools for computation in Sciences & Engineering" at 4. Innovative tools for computation in Sciences & Engineering Resource person Seminar Talk/ Symposium Department of Applied Sciences, CUIET, Punjab University Level December 13, 2022 60 Minutes Chitkara University, Punjab on December 13, 2022.

16. Sachin Kumar delivered an invited talk entitled "Investigation of novel exact solutions of the highly nonlinear partial differential equation via Lie symmetry analysis" at Department of Mathematics, Gandhigram Rural Institute-DTBU, Gandhigram, Tamil Nadu on February 02. 2023.

17. Sachin Kumar Presented a paper entitled "Lie symmetry analysis and a different set of exact closed-form solutions for strongly nonlinear evolution equations" at International Conference on Applied Engineering, Architecture, Physics, and Mathematical Sciences – Thailand 2023 during February 23 - 24, 2023.

18. Sachin Kumar delivered an invited talk entitled "Analytical exact solutions and dynamics of extremely challenging nonlinear evolution equations using various mathematical approaches" at Department of Mathematics, Kamala Nehru College, University of Delhi on January 19, 2023.

19. Sachin Kumar delivered an invited talk entitled "Solutions of higher-dimensional Nonlinear PDEs using the Lie symmetry method" at Srinivasa Ramanujan Department of Mathematics, Central University of Himachal Pradesh on March14, 2023.

20. Surendra Kumar Delivers a talk entitled "International Conference on Dynamical Systems, Control and their Applications" at IIT Roorkee, Uttarakhand, India during July, 1-3, 2022.

National/International MoUs Signed

a. NA

Other Inter-Institutional Collaborations

1. C.S. Lalitha collaborated with Prof. J. Dutta (Indian Institute of Technology Kanpur) India.
2. C.S. Lalitha collaborated with Prof. S. Chandra (Indian Institute of Technology Delhi), India.
3. Sachi Srivastava collaborated with Prof. Ralph Chill, TU Dresden, Germany.
4. Sachi Srivastava collaborated with Prof. Franco Fagnola, Politecnico Milano.
5. Sachi Srivastava collaborated with Dr. David Seifert,

University of Newcastle, UK.
6. Arvind Patel is serving as VC nominee, Subject expert and reserve category representative in various committees
7. Pratima Rai collaborated with Prof. Kapil Sharma, South Asian University.
8. Sachin Kumar collaborated with Prof. Abdul-Majid Wajwaz (Saint Xavier University), USA
9. Sachin Kumar collaborated with Prof. M.A. Abdou (University of Bisha) Saudi Arabia.
10. Sachin Kumar collaborated with Prof. Shoukry El Ganaini (Damanhour University), Egypt.
11. Sachin Kumar collaborated with Prof. M. M. Alanazi (Princess Nourah bint Abdulrahman University, Saudi Arabia).
12. Sumit Nagpal collaborated with Prof. Nak Eun Cho (Pukyong National University, Korea).

No. of Students under Exchange Programme

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Placement Details (Number and percentage of students placed)

Number of Companies Visited- 25, Highest Packed Offered- 19.5 Lacs per Annum, Highest package Received-16.75 Lacs per Annum, Average Package- 6 Lacs per Annum, and Percentage of Students Placed- 21.63 (45 out of 208)

Extension and Outreach Activities

1. C.S. Lalitha served as external member of the Board of Studies meeting at Faculty of Sciences, SGT University, Gurugram.
2. C.S. Lalitha served as member of Board of Studies in Department of Mathematics of Delhi Technological University.
3. Tarun Das organized a Refresher Course in Mathematical Sciences, September 02-15, 2022, CPDHE, University of Delhi.
4. Tarun Das organized International Conference on History of Mathematics, (On-line mode) December 16 -18, 2021, Indian Society of History of Mathematics, Ramjas College,

University of Delhi.
5. Sachi Srivastava organized a Refresher Course in Mathematics on the theme “Mathematics with an Emphasis on Topology, Analysis and Applications” for University and College teach-ers at Centre for Professional Development in Higher Education (CPDHE), UGC-HRDC, University of Delhi September 2022.
6. Sachi Srivastava organized a Outreach programme for undergraduates from Lady Shri Ram College for Women at the Department of Mathematics, South Campus in February 2023.
7. Hemant Singh Delivered a talk entitled “Beauty of Mathematics through Algebraic Topology” in the Refresher Course on Mathematics/ Operational Research/ Statistics and Computer Science (IDC) on the theme Mathematics with an Emphasis on Topology, Analysis and Applications held at the CPDHE, University of Delhi on 14th September, 2023.
8. Hemant Singh Delivered a session on “Geometry and Mathematics” for the DPS Teachers teaching Mathematics to classes III-V at the Human Resource Development Centre , The Delhi Public School Society, Knowledge Park V, Greater Noida, UP on February 12, 2023.
9. R. Panda delivered two lectures in CPDHE University of Delhi during September 2022, in "Refresher Course on Mathematics/ Operational Research/ Statistics and Computer Science (IDC)" . The titles were "Differentiation of multi variable functions and a version of Rolle's theorem" and "Arzela-Ascoli theorem and its applications

Faculty Strength

Faculty-20, Nasi Senior Scientist-1

Number of Ph.D. Degrees Awarded

21

Number of M.Phil. Degrees Awarded

5

Other Significant Information

Ruchi Das served as Dean, Faculty of Mathematical Sciences, during 1st April, 2022 to 3rd August, 2022. Ruchi Das served as Chairperson, BRS, Faculty of Mathematical Sciences, University of Delhi during (1st April, 2022 to 3rd August, 2022). Ruchi Das served as Head, Department of Mathematics, Faculty of Mathematical Sciences, during April, 2022 to March 2023. Ruchi Das is Member, Academic Council, University of Delhi and Member, Standing Committee on academic matters to the Academic Council, University of Delhi. Ruchi Das is Member of committee constituted by the Competent Authority for preparation of syllabus, books for Indian Knowledge System (IKS) , University of Delhi. Ruchi Das is Member of Committee constituted for formulation of re-employment of research oriented academicians for promoting and strengthening the research culture in the University and colleges. Ruchi Das is Subject Expert on Mathematical Sciences; Inspire Fellowship, DST, Ministry of Science and Technology, Government of India. Ruchi Das is Member of Subject Expert Committee (SEC) on Physical & Mathematical Sciences under Women Scientists Scheme-A (WOS-A), a flagship program of Department of Science and Technology (DST). Ruchi Das is Member of Subject Expert Committee (SEC) on Physical & Mathematical Sciences under WISE-PDF program of Department of Science and Technology (DST). Prof. Ralph Chill, SERB-VAJRA Faculty at the Department of Mathematics, University of Delhi offered an online "Compact Course on Analysis" during March 5-26, 2023. Sachi Srivastava extended services as Member, Scientific Committee, Annual Conference of Indian Women in Mathematics, held at IISER Pune in December 2022.