

DR. TALAT SULTANA

Associate Professor

Department of Mathematics

Jamia Millia Islamia (A Central University)

New Delhi-110025, India

E-mail: tsultana@jmi.ac.in (Primary)
talat17m@gmail.com (Secondary)



Academic Qualifications

B.Sc., M.Sc. (Mathematics), M.J.P. Rohilkhand University, Bareilly.

Ph.D. (Mathematics), Jamia Millia Islamia, New Delhi.

Field(s) of Specialization

- Numerical Analysis with Scientific Computing.
- Spline Functions.
- Boundary Value Problems.
- Ordinary and Partial Differential Equations

Research Guidance

- Co-supervisor- One student (Jamia Millia Islamia, New Delhi) (Deregistered).

Research Project Completed

- Co-Principal Investigator.
Research project entitled “**Computational Techniques for solving PDEs with Applications to Engineering Problems**” under “**TEQIP Collaborative Research Scheme**” awarded by **National Project Implementation unit (NPIU)** from May 2019.

Published / Accepted Research Work

- Arshad Khan and Talat Sultana, Non-polynomial quintic spline solution for the system of third order boundary value problem, **Numerical Algorithms**, **4**, **59** (2012) **541–559**, Springer, USA.

- Arshad Khan and Talat Sultana, Parametric quintic spline solution of third order boundary value problems, **International Journal of Computer Mathematics**, **12**, 89 (2012) 1663-1677, Taylor and Francis, UK.
- Arshad Khan and Talat Sultana, Parametric quintic spline solution for sixth order two-point boundary value problems, **Filomat**, **6**, 26 (2012), 1227-1239, Serbia.
- Pooja Khandelwal and Talat Sultana, Parametric septic splines approach for the solution of linear sixth-order two-point boundary value problems, **Applied Mathematics and Computation**, **219** (2013) 6856-6867, Elsevier, USA.
- Talat Sultana, A spline method for solving fourth order singularly perturbed boundary value problem, **Malaya Journal of Matematik**, **3**, 1 (2015) 51-61, University Press, Singapore.
- Arshad Khan and Talat Sultana, Parametric septic spline solution for some ordinary differential equations occurring in plate deflection theory, **International Journal of Nonlinear Science**, **2**, 21 (2016), 67-79, World Academic Union, UK.
- Arshad Khan and Talat Sultana, Numerical solution of fourth order parabolic partial differential equation using parametric septic splines, **Haceteppe Journal of Mathematics and Statistics**, **4**, 45 (2016) 1067-1082.
- Talat Sultana and Pooja Khandelwal, Tension spline technique for the solution of fourth-order parabolic partial differential equation, **Malaya Journal of Matematik**, **6**, 3 (2018) 514-520, University Press, Singapore.
- Talat Sultana, Arshad Khan and Pooja Khandelwal, A new non-polynomial spline method for solution of linear and non-linear third order dispersive equations, **Advances in Difference Equations**, 316 (2018). <https://doi.org/10.1186/s13662-018-1763-z>, Springer Open, UK.
- Pooja Khandelwal and Talat Sultana, Discrete Cubic spline technique for solving one dimensional Bratu's problem. Year: 2020, **Asian European Journal of Mathematics**. <https://doi.org/10.1142/S1793557122500115>.
- Zainav Khatoon, Arshad Khan and Talat Sultana, Solution of boundary value problems using fractal nonpolynomial spline, **Mathematics in Engineering, Science and Aerospace (MESA)**, Vol 12 No 3 (2021).
- Arshad Khan, Zainav Khatoon and Talat Sultana, Non-polynomial fractal quintic spline method for nonlinear boundary-value problems, **J. Computational Analysis and Applications**, Vol. 30, No.1, (2022).
- Shahna, Talat Sultana and Arshad Khan, Non-polynomial spline solution of one dimensional singularly perturbed parabolic equations, **J. Computational Analysis and Applications**, Vol. 30, No.2, (2022).
- Zainav Khatoon, Talat Sultana and Arshad Khan, Fractal non-polynomial spline method for the solution of fourth-order boundary value problems in plate deflection theory, **Mathematical Sciences**, (2022) 401–416. <https://doi.org/10.1007/s40096-021-00429-x>

Research Paper Presented in Conference

- “Numerical solution of sixth-order two point boundary-value problems using parametric septic splines” presented at **“CONIAPS-XIII”** held at University of Petroleum and Energy Studies, Dehradun during June 14-17, 2011.
- “Parametric spline solution for solving fourth order singularly perturbed boundary-value problem” presented at **“National Conference on Role of Mathematics in Advancement of Science & Technology, NCRMAT-2013”** held at B. S. N. V. College, Lucknow during October 18-20, 2013.
- “Numerical treatment of fourth order parabolic equation using spline method” poster presented at **“Annual Conference of Indian Women and Mathematics, IWM-2016”** held at University of Hyderabad, Hyderabad during June 29-30 & July 01, 2016.
- “Spline function approximation for solution of fourth order parabolic partial differential equation” presented at **“International Conference on Recent Advances in Mathematics, ICRAM-2018”** held at Aggarwal College Ballabgarh, Faridabad (Haryana), India during February 17-18, 2018.
- “Spline solution for third order partial differential equation” presented in online **“The 3rd International Conference on Recent Frontiers in Industrial and Applied Mathematics, FIAM-2020”** held at NIT Jamshedpur, India during December 21-22, 2020.
- “A new approach for solving third order partial differential equations via discrete spline technique” presented in online **“International Conference on Advanced Research in Mathematical Sciences, ICARMS-2021”** held at Department of Mathematics, Sri Manakula Vinayagar Engineering College, Puducherry, India during February 24-25, 2021.
- “A new approach for solving third order partial differential equations” presented in online **“International Conference on Dynamical Systems and Numerical Methods, ICDSNM-2022”** held at Department of Mathematics, Jamia Millia Islamia, New Delhi, India during May 20-21, 2022.

Conferences / Workshops Attended

- Participated in **“National Meet Of Research Scholars In Mathematical Sciences” (NMRSMS-08)** held during December 6-10, 2008 in IIT Kanpur.
- Participated in **“International Conference On Recent Trends In Mathematics And Its Applications” (ICRTMA-09)** held during March 30-31, 2009 in Jamia Millia Islamia, New Delhi.

- Participated in **“National Workshop Cum Training Programme On Advanced Numerical Techniques And Applications” (NWCTP-ANTA-09)** held during June29-July11,2009 in Banaras Hindu University, Varanasi.
- Participated in **“Homi Bhabha Birth Centenary Symposium On Hyperbolic Partial Differential Equation And Related Topics”** held during July 20-24 ,2009 in Tata Institute Of Fundamental Research, Bangalore.
- Participated in **“Advances In Mathematics: Focus On Women In Mathematics”** held during October 05-07, 2009 in Jawaharlal Nehru University, New Delhi.
- Participated in International Workshop on **“New Directions in Applied Mathematics”** held during January 01- 03, 2010 in Indian Institute of Science, Bangalore.
- Participated in the **“International Conference of Women Mathematics”** held during August 17-18, 2010 in Hyderabad University, Hyderabad.
- Participated in the **“International Congress of Mathematics”** held during August 19-27, 2010 in Hyderabad University, Hyderabad.
- Participated in the **“National Workshop on Scientific/Research Paper Writing”** held during April 05-07, 2013 in Mohanlal Sukhadia University, Udaipur, Rajasthan.
- Participated in the **“Workshop on Foundation Course-Information Technology”** held during July 26,27 and 29, 2013 organized by UGC-ASC, Centre for Professional Development in Higher Education, University of Delhi , New Delhi.
- Participated in the **“Workshop on Foundation Course-Building Mathematical Ability”** held during February 01-02, 2014 organized by UGC-ASC, Centre for Professional Development in Higher Education, University of Delhi , New Delhi.
- Participated in the **“National Program on Differential Equations: Theory, Computation & Applications (NPDE-TCA)”** held during November 16-20, 2015 in IIT Mandi, Mandi, Himachal Pradesh.
- Participated in the **“International Workshop on Numerical Methods in Scientific Computing, IWNMSC-2020”** held during February 21-22, 2020 in South Asian University, New Delhi, India.
- Participated in the online workshop on **“R-Programming”** held during July 28-30, 2020 organized by Malla Reddy Institute of Technology and Science, Hyderabad.

Refresher / Orientation / Faculty Development Programme Attended

- Successfully completed the **118th four-week orientation programme** organized by the UGC-HRDC, Jamia Millia Islamia, New Delhi from 23 May to 19 June, 2017.
- Successfully completed the **1st 3-week Refresher Course in Computational and Mathematical Studies (Computer Science, Mathematics & Statistics)** organized by the UGC-HRDC, Jamia Millia Islamia, New Delhi from 29 August to 19 September, 2018.

- Successfully completed the National one week online Faculty Training Program on **“Pedagogical Training for Effective Online Teaching & Learning”** organized by Deen Dayal Upadhyaya College , University of Delhi & K. T. H. M. College, Nashik from 03-10 August, 2020.
- Successfully completed the one week online Faculty Development Program on **“ICT Enhanced Teaching Learning and Creating MOOCs”** organized by TLC, Ramanujan College, University of Delhi & IQAC Shivaji College, University of Delhi from August 18-25,2020.
- Successfully completed the two week online Faculty Development Program on **“Learning Advanced E-Tools for MOOCs Development and Research”** organized by TLC, Ramanujan College, University of Delhi & Motilal Nehru College (E), University of Delhi from September 1-14,2020.
- Successfully completed the two week online Refresher Course on **“Data Analysis with Statistical Methods”** organized by TLC, Ramanujan College, University of Delhi & India Accounting Association, NCR Chapter from December 21, 2020 to January 03,2021.
- Successfully completed the two week online Refresher Course on **“Advanced Research Methodology Tools and Technique”** organized by TLC, Ramanujan College, University of Delhi from January 03, 2021 to February 14, 2021.
- Successfully completed **NEP 2020 Orientation & Sensitization Programme under Malaviya Mission Teacher Training Programme (MM-TTP) of University Grants Commission (UGC)** Organized by MMTTC, Jamia Millia Islamia, New Delhi from March 18, 2024 to March 28, 2024.

Administrative Assignments

- Convener, Mathematics Fest, JDMC, DU. (2013-14)
- Member, Prize Committee, JDMC, DU. (2013-14)
- Member, Prize Committee, LBC, DU. (2015-16)
- Co-convener, Scholarship Committee, LBC, DU. (2015-16)
- Member, BA(Prog) Admission Committee, LBC, DU. (2016-17)
- Member, Website Committee, LBC, DU. (2016-17)
- Member, Stock Verification Committee, LBC, DU. (2016-17)
- Co-Convener, Website Committee, LBC, DU. (2017-18)
- Convener, Prize Committee, LBC, DU. (2017-18)
- Co-Convener, Digital Initiative Committee, LBC, DU. (2018-19)
- Member, Youth Red Cross Committee, LBC, DU. (2018-19)
- Member, Digital Initiative Committee, LBC, DU. (2019-23)
- Member, Data Management Committee, LBC, DU. (2019-23)
- Teacher-In-Charge, Department of Mathematics, LBC, DU. (2020-21)
- BOS/Supervisor’s Nominee, RAC, Department of Mathematics, JMI (2023-24)
- Member, Subject Allotment Committee, Department of Mathematics, JMI (2023-24)

Award

- NBHM postdoctoral fellowship. (Dec. 2012).

Membership

- Ramanujan Mathematical Society, Membership No. 613, India.
- International Association of Engineers (IAENG), Membership No. 113560, Hong Kong.

Teaching Experience

- Working as an Associate Professor since July 2023 in the department of Mathematics, Jamia Millia Islamia (Central University), New Delhi.
- Worked as an Assistant Professor from March, 2015 to July 2023 in Lakshmibai College, University of Delhi, New Delhi.
- Worked as an Assistant Professor (Adhoc) from July, 2013 to March, 2015 in J.D.M. College, University of Delhi, New Delhi.
- Worked as an Assistant Professor (Adhoc) from January, 2013 to April, 2013 in J.D.M. College, University of Delhi, New Delhi.
- Worked as a Lecturer from July, 2011 to Jan, 2013 in Al-Falah School of Engineering and Technology, Dhauj, Faridabad, Haryana.
- Taught M. Tech classes from July, 2012 to Dec. 2012 in Al-Falah School of Engineering and Technology, Dhauj, Faridabad, Haryana.

Courses Taught

- **Undergraduate:** Numerical Methods with MATLAB programming, Ordinary Differential Equations, Partial Differential Equations, Differential Calculus, Integral Calculus, Vector Calculus, Matrix Theory, Real Analysis, Differential Equation and Mathematical Modeling, Latex & HTML, Computer Algebra System and Related Software, Dynamical System.
- **Postgraduate:** Numerical Analysis, Laplace Transforms and Fourier Transforms and their Applications, Linear Integral Equations, Ordinary Differential Equations, Partial Differential Equations, Integration in Series.

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