Dr. Abhisekh Shekhar

Assistant Professor (Senior Scale),
Department of Mathematics,
C.M. Science College, Darbhanga-846004,
Bihar, India
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Education

- **Ph.D. in Mathematics:** University Department of Mathematics, LNMU, Darbhanga
  Topic: Some investigation in the Theory of fractional Fourier transform and Pseudo-Differential Operators.
  Supervisor: Dr. Navin Kumar Agrawal, Professor & Ex-Head of Department.
- **M.Sc. in Mathematics:** Indian Institute of Technology, Kharagpur, 2010 (67.8%).
- **B.Sc. (Hons.) in Mathematics:** Magadh University, Bodh-Gaya, 2007 (63.12%).

Employment

- Assistant Professor (Senior Scale): 18/11/2023 - Present, C.M. Science College, Darbhanga-846004, Bihar, India
- Assistant Professor: 01/07/2022 - 17/11/2023, C.M. Science College, Darbhanga-846004, Bihar, India
- Assistant Professor: 18/11/2017 - 30/06/2022, Kalidas Vidyapati Science College, Uchchaith, Madhubani-847223, Bihar, India

Administrative Appointments & Official Activities

C.M. Science College, Darbhanga, Bihar:

- Member, Paper Verification Cell: 05/08/2025 to Present.
- Authorized Signatory, Student Documentation. 02/07/2025 to Present.
- College Internship Nodal Officer (CINO): 29/04/2026 to Present.
- Faculty Development Programme Co-Ordinator: 02/07/2026 to Present.
- Co-Ordinator of Department of B.C.A.: 12/08/2023 to 03/09/2025.

K.V.Sc. College, Uchchaith, Madhubani, Bihar (18/11/2017 – 30/06/2022):

- Nodal Officer of the College for online reporting: 17/05/2018 – 30/06/2022.
- Bursar: 04/06/2019 – 30/06/2022.
- Co-Ordinator of Training and Placement Cell: 28/06/2019 – 30/06/2022.
- Co-Ordinator of IQAC: 01/02/2020 - 30/06/2022.

- Warden of Women's Hostel: 02/01/2018 – 30/06/2022.
- Admission In-charge: 02/01/2018 – 30/06/2022.
- Centre Superintendent: 01/06/2020 – 31/01/2021.

Research Interests

History of Mathematics, Pseudo-differential Operators, Fractional Fourier Transform, Distribution Theory, Functional Analysis, and Mathematical Modeling.

Research Guidance (Ph.D. Students)

- **Annu Kumari:** *Topic:* "Progress on the fractional Fourier Transform and related Operators"
- **Shivesh Kumar Roy:** *Topic:* "Recent Advances in Coupled fractional Fourier Transform and related Operators"
- **Priya Priyadarshani:** *Topic:* "A development of Two-dimensional Fourier-Jacobi Transform and some allied integral operators"
- **Anmol Kumar:** *Topic:* "Theoretical developments of the fractional Hartley Transform with some Investigations"

Scholarships & National Exams

- Secured UGC-JRF, NET Exam, June 2011
- GATE Exam, 2010; GATE Exam, 2011

Prior Teaching Experience

- Worked as Faculty Member at Nilai Educational Trust Group of Institutions, Thakur Gaon, Ranchi, Jharkhand (From 26/12/2015 to 30/12/2016).
- Worked as Guest Faculty, Centre of Applied Mathematics, in Central University Jharkhand (February 2015 to May 2015).
- Worked as Faculty Member at Cambridge Institute of Technology, Ranchi (One month, June 2012).
- Worked as Faculty Member at K.K.C.E.M. NALANDA, Bihar (January 2012 to May 2012, six months).

Additional Academic Activities & FDPs

- Refresher Course: Deptt. of Mathematical Sciences, Tezpur University, 11/12/2024 to 24/12/2024.
- One Week Faculty Development Programme, INVERTIS UNIVERSITY, BAREILLY, 28/07/2020 to 02/08/2020.
- Teaching Learning Centre, Ramanujan College University of Delhi under the aegis of MINISTRY OF EDUCATION, PANDIT MADAN MOHAN MALAVIYA NATIONAL MISSION ON TEACHERS AND TEACHING, 14 - 28 June, 2021.

- 82nd Orientation Programme, UGC-HRDC, Patna University, Patna, 22/01/2019 to 18/02/2019.
- Workshop on Sobolev Spaces, conducted by Department of Mathematics, IIT Patna, February 16-23, 2017.

Research Publications (Referred Journals / UGC-CARE / Scopus Listed)

1. A. Prasad, Abhisekh Shekhar; Sobolev type spaces associated with fractional Fourier transform; Bull. Cal. Soc., 106, (1) 1-12 (2014), Peer-Reviewed.

2. Abhisekh Shekhar, N.K. Agrawal; Fractional Fourier transform in extended Sobolev type spaces; IOSR Journal of Mathematics (IOSR-JM); Volume 18, Issue 6 Ser. I (Nov. – Dec.2022), PP 45-55, Peer-Reviewed.

3. Abhisekh Shekhar, N.K. Agrawal; GENERALIZED PSEUDO-DIFFERENTIAL OPERATORS ASSOCIATED WITH SYMBOL CLASSES INVOLVING FRACTIONAL FOURIER TRANSFORM; Serdica Math. J. 48 (2022), 247–270; UGC-CARE.

4. Abhisekh Shekhar, N.K. Agrawal; Non-Archimedean Pseudo-differential Operators $B_{\psi 1,\psi 2}$ Connected with Fractional Fourier Transform; IJMAA, 11(2)(2023), 59–70; Peer-Reviewed.

5. Abhisekh Shekhar, N.K. Agrawal; Fractional Fourier Transform on Sobolev Spaces Connected to Negative Definite Functions; Asian Journal of Pure and Applied Mathematics, Volume 5, Issue 1, Page 112-122, 2023; Article no.AJPAM.1260, Peer-Reviewed.

6. Abhisekh Shekhar, N.K. Agrawal; Inequality and estimate of generalized pseudo-differential operators involving fractional Fourier transform; AIP Conference Proceeding, AIP Conf. Proc. 3087, 09001 (2024), Scopus.

7. Abhisekh Shekhar; Fractional Fourier-Bessel type transform; AIP Conference Proceeding, AIP Conf. Proc. 3180, 02007 (2024), Scopus.

8. Abhisekh Shekhar; Compactness of Pseudo-Differential Type Operators Involving Fractional Fourier Transform; Asian Research Journal of Mathematics, Volume 21, Issue 9, Page 44-59, 2025; Article no.ARJOM.143161, Peer-Reviewed.

9. Abhisekh Shekhar; A Comprehensive Study Of Sustainable Future Of Fractional Fourier Transform; Journal of Harbin Engineering University, Vol 46 No. 9 September 2025, Scopus.

10. Abhisekh Shekhar; The Estimation of Pseudo-differential Operators Utilising the Coupled Fractional Fourier Transform and a Certain Inequality; Asian Research Journal of Mathematics, Volume 21, Issue 9, Page 99-112, 2025; Article no.ARJOM.143721, Peer-Reviewed.

11. Abhisekh Shekhar; Coupled Fractional Fourier Transform On Sobolev Spaces Related To The Negative Definite Functions; IOSR-JM, Volume 21, Issue 5, Ser. 1 (Sept. – Oct. 2025), PP. 09-17, Peer-Reviewed.

12. Abhisekh Shekhar; A Study on the Fourier Transforms with Their Utilizations; Journal of Harbin Engineering University, Vol 46 No. 9 September 2025, Scopus.

13. Abhisekh Shekhar; Notion of Non-archimedean Pseudo-differential Operators Associated with Fractional Fourier Transform; Int. J. Math. And Appl., 13(3)(2025), 175–186, Peer-Reviewed.

14. Abhisekh Shekhar; A Note on The History of Mathematics in Ancient World and His Applications; Journal of Harbin Engineering University, Vol 46 No. 9 September 2025, Scopus.

15. Abhisekh Shekhar; Some Results on Pseudo-differential Operators Related Coupled Fractional Fourier Transform Involving Semi-norms & Norms; Asian Research Journal of Mathematics, Volume 21, Issue 10, Page 109-128, 2025; Article no.ARJOM.144957, Peer-Reviewed.

16. Abhisekh Shekhar; Compactness Properties of Pseudo-differential Operators Related with the Coupled Fractional Fourier Transform; Asian Research Journal of Mathematics, Volume 21, Issue 11, Page 21-35, 2025; Article no.ARJOM.144958, Peer-Reviewed.

17. Abhisekh Shekhar; A History of the Mathematics during the Scientific Revolution; International Journal of Scientific Research in Science and Technology, Volume 12, Issue 6, November-December-2025, 272-283, Peer-Reviewed.

18. Abhisekh Shekhar; Stein-type Inequalities for the fractional Fourier Transform; Journal of Harbin Engineering University, Vol 46 No. 11 November 2025, Scopus.

19. Abhisekh Shekhar; Some mathematical properties of two versions of pseudo-differential operators involving the coupled fractional Fourier transform; Communications on Applied Nonlinear Analysis, Vol 32 No. 7s (2025), 978-993, Scopus.

20. Abhisekh Shekhar; Product and Commutator of pseudo-differential operators involving the couple fractional Fourier transform; International Journal of Applied Mathematics, Volume 38 No. 5 2025, 1598-1623, Scopus.

21. Abhisekh Shekhar; Bessel Type Function J0β, Bessel Type Operator Δ0 β and Fractional Fourier-Bessel Type Transform F 0; Int. J. Math. And Appl., 13(4)(2025), 159–168, Peer-Reviewed.

22. Abhisekh Shekhar; A discussion on non-archimedean pseudo-differential operator related with the coupled fractional Fourier transform; International Journal of Applied Mathematics, Volume 38 No. 11 2025, 3196-3203, Scopus.

23. Abhisekh Shekhar; The use of mathematics in educational institutions during the Scientific Revolution; Educational Administration Theory and Practice, 2024, 30(1), 8372-8384, Scopus.

24. Abhisekh Shekhar; The non-archimedean pseudo-differential operator Aϕ9,k1,92 involving coupled fractional Fourier transform connected to negative definite functions; Journal of Computational Analysis and Applications, VOL. 33, NO. 8, 2024, 7811-7823, Scopus.

25. Abhisekh Shekhar; A Mathematical Literature of Nested Intervals from “Archimedes” to “Georg Ferdinand Ludwig Philipp Cantor”; Scope, Volume 15 Number 04 December 2025, 2190-2206, Scopus.

26. Abhisekh Shekhar; Some Contributions of Calculus Pedagogy in Engineering Mathematics from 19th to 21st century; Anusandhanvallari, Vol 2023, No.1 January 2023, UGC-CARE.

27. Abhisekh Shekhar; A brief History of the Mathematical Development of Probability Theory; Samdarshi, ISSN: 2581-3986 Vol 15 Issue 3 (August 2022), UGC-CARE.

Paper Presentations in Seminars / Conferences

1. Inequality and estimate of Generalized pseudo differential operators Involving fractional Fourier transform; 2nd International Conference on Applied Mathematics & Computational Sciences-2022 (ICAMCS-2022), Oral, Department of Mathematics, DIT University, Dehradun, India-248009, October 12-14, 2022

2. Fractional Fourier-Bessel Transform; International Conference of the Mathematical Society-BHU on Recent Trends in Mathematical And Computational Sciences (RTMCS), Oral, DST-Centre for Interdisciplinary Mathematical, Sciences (CIMS), Institute of Sciences Banaras Hindu University, Varanasi-221005, India, February 3-5, 2023.

3. Fractional Fourier-Bessel Type Transform; International Conference on Mathematics and its Applications in Technology (ICMAT23), Oral, SASTRA Deemed University, Kumbakonam-612001, Tamil Nadu, India, March 24-25, 2023.

4. Norms of pseudo-differential type operator modulo compact operators; International Conference on Recent Advances in Mathematics and Data Science (ICRAMDS-2024), Oral, Deptt. Of Maths., Bioinformatics and Computer Application MANIT, Bhopal, 27th to 28th June, 2024.

5. Some Mathematical Properties of Fractional Fourier-Bessel Transform; Recent Trends in Mathematics in the Fields of Science and Technology (RMST-2024), Oral, Deptt. Maths., Vasavi College of Engineering, Hyderabad, Telangana, 11th-12th, March 2024.

6. Product and Commutator of pseudo-differential operators Involving the coupled fractional Fourier transform; International Conference on Mathematical Sciences, Physical Sciences

and their Applications (ICMSPSA-2024), Oral, Deptt. Of Maths., A.P.S. University, Rewa (M.P.), November 13-14, 2024.

7. Coupled Fractional Fourier transform on Sobolev spaces connected to negative definite functions; International Conference on Mathematics and its applications, Oral, PG & Research Department of Mathematics, Periyar Arts College, Cuddalore, Tamilnadu, India, 13th December, 2024.

8. Two versions of pseudo-differential operators involving the coupled fractional Fourier transform; International Conference on Recent Advances in Mathematics, Statistics, and Data Science (RAMSDS 2024), Oral, Adamas University, Kolkata, West Bengal, India, 27th -28th November 2024.

9. Compactness of pseudo-differential type operators involving fractional Fourier transform; International Conference on Advances in Mathematical Sciences, Oral, MGCU, Motihari, Bihar, India, March 19-20, 2024.

10. Certain Inequality and Estimate of Pseudo-differential operators involving the coupled fractional Fourier transform; International conference on Advances in Computational Mathematics and Applied Physical Sciences (ICACMAPS 2025), Oral, G.Pulla Engineering College, Kurnool, Andhra Pradesh, India, 11th & 12th January, 2025.

Books Published by National/International Publishers

1. Dr. Abhisekh Shekhar; Linear Algebra; Lubicon Publications, 4/4A Bloomsbury Square, London, WC1A2RP, England, ISBN: 978-1-80433-837-7 (International Publishers).

2. Dr. Abhisekh Shekhar; Contemporary Engineering Mathematics; Lubicon Publications, 4/4A Bloomsbury Square, London, WC1A2RP, England, ISBN: 978-1-80433-836-0 (International Publishers).

3. Dr. Abhisekh Shekhar; Comprehensive Complex Analysis; Weser Books No. 79737, Aussere Weberstr. 5702763 Zittau, Germany, ISBN: 978-3-96492-740-8 (International Publishers).

4. Dr. Abhisekh Shekhar; Ordinary Differential Equation; Swaranjali Publication, 1-B, 10-B, Vasundhara, Ghaziabad, U.P.-201012, ISBN: 978-93-6559-481-2 (National Publishers).

5. Dr. Abhisekh Shekhar; Theory of Real Function; Adam’s Book Company, E Group, Old Vidi Gharkul, Solapur-413005, Maharashtra, ISBN: 978-93-48930-90-5 (National Publishers).

6. Dr. Abhisekh Shekhar; Partial Differential Equation; Kripa-Drishti Publications, A/503, Poorva Height, SNO 148/1A/1/1A, Sus Road, Pashan-411021, Pune, Maharashtra, India, ISBN: 978-81-992618-4-6 (National Publishers).

7. Dr. Abhisekh Shekhar; Real Analysis; Swaranjali Publication, 1-B, 10-B, Vasundhara, Ghaziabad, U.P.-201012, ISBN: 978-93-6559-878-0 (National Publishers).

8. Dr. Abhisekh Shekhar; Functional Analysis; Big Book Distributor, B-507, Saya Zions, Greater Noida West, U.P.-201305, ISBN: 978-93-6558-770-8 (National Publishers).

9. Dr. Abhisekh Shekhar; Group Theory; Kripa Drishti Publications, A/503, Poorva Height, SNO 148/1A/1/1A, Sus Road, Pashan-411021, Pune, Maharashtra, India, ISBN: 978-81-992618-5-3 (National Publishers).

Book Chapters & Patents

Chapters in Edited Books:

- 1. Dr. Abhisekh Shekhar; Negative Definite Functions on Sobolev Type Spaces with Fractional Fourier Transform; Chapter 7, Print ISBN: 978-93-88417-60-0, eBook ISBN: 978-93-88417-42-6, Mathematics and Computer Science: Research Updates Vol. 7; DOI: https://doi.org/10.9734/bpi/mcsru/v7/6452.
- 2. Dr. Abhisekh Shekhar; A Note on Partial Differential Operator, Integrated Science Companion (Core Concepts in Chemistry, Physics and Mathematics), Swaranjali Publication, 1-B, 10-B, Vasundhara, Ghaziabad, U.P.-201012.

Patents:

- 1. Adjustable Tablet Frame, National.
- 2. Differential Equation and Integral Transform Processing Apparatus, International.
- 3. Quantum Probability Wave Former Board.

Technical Skills & Computer Proficiency

- Operating Systems: Windows, Linux
- Mathematical Softwares: Matlab, Mathematica
- Programming Languages: C
- Typing Software: LaTeX

Personal Profile

Father's Name	Sri Devendra Prasad
Mother's Name	Smt. Chintamani Devi
Wife's Name	Smt. Sandhya Kumari
Son's Name	Vaibhav Shekhar
Date of Birth	20th April, 1986
Languages Known	English, Hindi
Permanent Address	Village - Chilim, Post Office – Chilim, Via-Sherghati, District - Gaya, Bihar, Pin Code - 824211