Curriculum Vitae

Dr. Ashok Kumar

Associate Professor
Department of Mathematics
University of Delhi, Delhi-110007
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Educational Qualification:

- **Indian Institute of Technology Roorkee, Ph.D., Mathematics (Grades/Marks: 2005-2011**
  - Title of Thesis: Numerical Studies of Some Convective Flow in Porous Media: Stability in Vertical Pipe
- **Indian Institute of Technology Roorkee**
  - M.Sc., Applied Mathematics, 2002-2004
- **C.C.S University Meerut**
  - B.Sc.: Mathematics, Physics and Chemistry, 1999-2002

Present Designation:

- Associate Professor, Since 17^{th} June, 2025
  - Organization: University of Delhi, Delhi-110007 (Garhwal), Uttarakhand

Area of Specialization:

- **Computational fluid dynamics (CFD)**
  - Research area and current interest: Hydrodynamic stability, CFD using Spectral/Spectral Element Methods, Convection in porous media, Hydrodynamic Stability, Numerical Solutions of ODEs and PDEs.

Professional Experience (in chronological order):

- Associate Professor, Department of Mathematics, HNB Garhwal University, Srinagar (14^{th}June, 2022 - 13^{th} June, 2025)
  - Teaching & Research.
- Assistant Professor, Department of Mathematics, HNB Garhwal University, Srinagar (05^{th} Sept., 2013 - 13^{th} June, 2022)
  - Teaching & Research.
- Assistant Professor, Dr. B. R. Ambedkar National Institute of Technology Jalandhar (03^{rd} April, 2012 - 04^{th} Sept., 2013)
  - Teaching & Research.
- Assistant Professor, Govt. PG College Kandhla, U.P (India) (15^{th} January, 2011- 02^{rd} April, 2012)
  - Teaching & Research.

Foreign Visit:

- **Imperial College, London, United Kingdom, in 2014**.

Research Project / Start-up-Grant for Research:

- **University Grants Commission (UGC) Start-up-Grant of Rs. 06 Lakhs (Letter No. F.30-57/2014(BSR))**.
- **Department of Science** & **Technology (DST)-SERB of Rs. 27.38 Lakhs (Letter No. EMEQ-159/2014)**.
- **Department of Science** & **Technology (DST)-SERB of Rs. 06 Lakhs (Letter No. MTR/2022/000553)**.

Awards and Recognitions:

- NET(National Eligibility Test)-JRF(Junior Research Fellow)-CSIR - Dec. 2004, SPM-Call.
- NET-JRF (CSIR) Dec. 2005.

- NET-JRF (CSIR) Dec. 2007.
- Junior Research Fellow (CSIR fellowship) 2004- 2006, IIT Roorkee.
- Senior Research Fellow (CSIR fellowship) 2006 -2010, IIT Roorkee
- GATE 2006, AIR - 196
- GATE 2007, AIR - 619
- GATE 2008, AIR - 213

Attended Symposium/Study Group Meeting/QIP Program:

1. Instructional School on Partial Differential Equations and National Symposium on Hyperbolic PDEs, **Department of Mathematics, IIT Bomby** During 22-06-2008 to 17-07-2008.
2. Study Group Meeting on Industrial Problems, **Department of Mathematics, IIT Roorkee**, during March, 16-21, 2009.
3. QIP Program on Interaction of Academicia-Industry on Mathematical Modeling, Organized by **Department of Mathematics, IIT Roorkee** on March 31, 2012.
4. QIP Program on Breathing Mechanics, Organized by **Department of Mathematics, IIT Roorkee** on March 31, 2013.
5. Orientation Program, Organized by **Academic Staff College, JNU Delhi** during 23-02-2015 to 20-03-2015.
6. Refresher Course in Mathematical Sciences, Organized by **, CENTRE FOR PROFESSIONAL DEVELOPMENT IN HIGHER EDUCATION UGC - Human Resource Development Centre, University of Delhi** during 29-08-2016 to 20-09-2016.
7. Nurturing Future Leadership Program, under the aegis of Malaviya Mission Teacher Training Program, Department of Higher Education, Ministry of Education, Govt. of India, 11-15 March 2024 **IIM Visakhapatnam**.

Administrative Responsibilities :

1. Deputy Chief Vigilance officer
2. VC Nominee (BoS, Mathematics)
3. Member (BoS, Mathematics)

4. Convener (B.Sc. I Admission Committee)
5. Co-convener (B.Sc. I Admission Committee)
6. Convener (M.A./ M.Sc. I Admission Committee)
7. Coordinator (Remedial Coaching Centre)
8. Co Coordinator (DST Inspire Program)
9. Coordinator (Short Term Training Program @ NIT UK)
10. Assistant Warden
11. Assistant Proctor

Foreign Visit:

- **Imperial College, London, United Kingdom, in 2014**.

Books:

1. Mukesh Kumar, A. P. Singh and Ashok Kumar
   Differential Calculus
   MEDTECH A division of Scientific International Publication
   ISBN : 978-93-887025-54-7
2. Mukesh Kumar, A. P. Singh and Ashok Kumar
   Integral Calculus
   MEDTECH A division of Scientific International Publication
   ISBN : 978-93-86800-08-4
3. Mukesh Kumar, A. P. Singh and Ashok Kumar
   Probability and Statistics
   MEDTECH A division of Scientific International Publication
   ISBN : 978-93-887025-52-3
4. Mukesh Kumar, A. P. Singh, A. Chauhan and Ashok Kumar
   Linear Algebra
   MEDTECH A division of Scientific International Publication
   ISBN : 978-93-87025-53-0

Research Publications:

1. Ashok Kumar and P. Bera, Natural convection in an anisotropic porous enclosure due to non-uniform heating from the bottom wall, **ASME J. Heat Trans.**, Vol. 131, pp. 07260-1-13 (2009). [IF: 2.8]

2. Ashok Kumar, P. Bera and J. Kumar, " Non-Darcy mixed convection in a vertical pipe filled with porous medium, **Int. J. Thermal Sciences**, Vol. 50, pp. 725-735 (2011). [IF: 4.9]

3. P. Alam, Ashok Kumar, S.R. Ansari and S. Kapoor, " Numerical investigation of natural convection in a rectangular enclosure due to partial heating and cooling at vertical walls, **Communication Nonlinear Sciences and Numerical simulation**, Vol. 17, pp. 2403-2414 (2012). [IF: 3.4]

4. S. Kapoor, P. Bera and Ashok Kumar, Effect of Rayleigh thermal number in double diffusive non-Darcy mixed convective flow in vertical pipe filled with porous medium, **Procedia Engineering**, Vol. 38, pp. 314-320 (2012). [SCOPUS]

5. Ashok Kumar, Pravez Alam and Prachi Fartyal, "Thermo-solutal natural convection in an anisotropic porous enclosure due to sinusoidal variation of temperature and concentration at bottom wall" **Advances in Applied Mathematics and Mechanics**, Vol.7, no. 4, pp. 1-19, (2015). [IF:1.5]

6. Ashok Kumar, Pravez Alam, S. Kapoor., "Numerical Investigation of Mixed Convective Flow in Parallel Channel Filled With Porous Medium" **Nonlinear Engineering Modeling and Application**, Vol.4, pp. 203-208, (2014). [IF:2.4]

7. Ashok Kumar, "Linear stability of Poiseuille flow in a vertical pipe filled with porous medium", Proceedings of the World Congress on Engineering 2,Proceedings of the World Congress on Engineering 2014 Vol II, WCE 2014, July 2 - 4, 2014, London, U.K.

8. Deepak Dhiman, Ashok Kumar and Ganga Ram Gautam, "EXISTENCE OF SOLUTION TO FRACTIONAL ORDER DELAY DIFFERENTIAL EQUATIONS WITH IMPULSES", **Advanced Math. Models & Applications**, Vol.2 (2), 2017. [SCOPUS]

9. Km. Renu and Ashok Kumar, "Effect of Radiation on Hydromagnetic Mixed Convective Flow in a Vertical Channel Filled With Porous Media: A Thermal Non-equilibrium Approach" JOURNAL OF HEAT TRANSFER-TRANSACTIONS OF THE ASME, 142 (2020), DOI: https://doi.org/10.1115/1.4045889. [IF:2.8]

10. H. M Baskonus, Ajay Kumar, Ashok Kumar, W. Geo, Deeper investigations of the (4 + 1)-dimensional Fokas and (2+ 1)-dimensional Breaking Soliton equations, International Journal of Modern Physics B, 2050152, pp. 1-16 (2020). [IF:2.6]

11. Deepak Dhiman, Ashok Kumar, Ashish Kumar and Lakshmi Narayan Mishra, Existence and controllability of Hilfer fractional differential inclusions, GANITA, Vol.70(2), pp. 49-66 (2020). [SCOPUS]

12. Deepak Dhiman, Ashok Kumar and Lakshmi Narayan Mishra, Existence And Uniqueness Solutions Of Fractional Integro-Differential Equations With Infinite Point Conditions, South East Asian J. of Mathematics and Mathematical Sciences Vol. 16 (2) , pp. 219-240 (2020). [SCOPUS]

13. K Renu,Ashok Kumar, A Kumar, J Kumar, Effect of Transverse Hydromagnetic and Media Permeability nn Mixed Convective Flow in a Channel Filled by Porous Medium, Special Topics & Reviews in Porous Media: An International Journal 12 (2), 1-23 (2021). [IF:1.4]

14. K Renu, Ashok Kumar, AK Sharma, Influence of Prandtl number on mixed convective flow in a vertical pipe filled with porous medium: A linear stability analysis, Physics of Fluid 33 (5), 054112 (2021). [IF:4.1]

15. K Renu, Ashok Kumar, AS Negi, Chebyshev Spectral Collocation Method for Magneto Micro-Polar Convective Flow Through Vertical Porous Pipe Using Local Thermal Non-equilibrium Approach, International Journal of Applied and Computational Mathematics, 7 (3), 117: 1-21 (2021).

16. A Prakash, A Kumar, HM Baskonus, Ashok Kumar, Numerical analysis of nonlinear fractional KleinFockGordon equation arising in quantum field theory via CaputoFabrizio fractional operator, Mathematical Sciences 15, 269-281, (2021). [IF:1.9]

17. AS Negi, B Kumar, Ashok Kumar, C Kumari, K Prachi, AJ Chamkha, Transportation of TiO2/GOH2O hybrid nanofluid between two discs, Indian Journal of Physics 12, https://doi.org/10.1007/s12648-021-02212 (2021). [IF:1.6]

18. AK Prasad, J Kumar,Ashok Kumar, Isotropic uncharged model with compactness and stable configurations, Arabian Journal of Mathematics 10 (3), 669-683, (2021). [IF:0.9]

19. AS Negi, B Kumar, Ashok Kumar, Prachi, A Singhal, AK Roay, AJ ChamkhaThe Transportation of Maxwell Fluid in the Rotating and Stretching System: Rotor-Stator Spinning Disc Reactor Applications, Journal of Nano Fluids 12, 1-10, (2022). [IF:2.7]

20. R saini, R Saini, Ashok Kumar, K Mohamed, Amine, Free axisymmetric vibrations of heated non-uniform Bi-directional FGM Mindlin rings employing quadrature approaches, Thin-Walled Structure 184, 110482, (2023). [IF:5.7]

21. AS Negi,Ashok Kumar, M Yaseen, SK Rawat, A Saini, Effects of heat source on the stagnation point flow of a nanofluid over a stretchable sheet with magnetic field and zero mass flux at the surface, Forces in Mechanics 11, 100190, (2023). [IF:3.2]

22. AS Negi, A Saini, Ashok Kumar, SK Rawat, M Yaseen, A Saini, A numerical analysis of fluid flow and heat transfer between two rotating disks with induced porous medium, Numerical Heat Transfer, Part B: Fundamentals (2024), 1-16, https://doi.org/10.1080/10407790.2023.2296621. [IF:1.7]

23. A Saini, AS Negi, A Kumar, Ashok Kumar, AJ Chamkha, Radiative convective heat transfer and magneto-hydrodynamic flow in a viscous fluid-saturated porous channel with variable thermal conductivity, International Journal of Ambient Energy 45 (1), 2406908(2025)https://doi.org/10.1080/01430750.2024.2406908. [IF:2.67]

24. S Bansal, Ashok Kumar, A Saini, AS Negi, S Singh, Exploring the Atwood number impact on shock-driven hydrodynamic instability at pentagonal interface using discontinuous Galerkin simulations, Physica D: Nonlinear Phenomena 467, 134276https://doi.org/10.1016/j.physd.2024.134276. [IF:2.7]

25. M Kumar, J Kumar, Ashok Kumar, Physically Viable Imperfect Fluid Models of Compact Stars, International Journal of Theoretical Physics 63 (9), 224(2024). [IF:1.3]

26. K Renu, Ashok Kumar, Effect of Wall Conductivity on Mixed Convection Magnetohydrodynamic Nanofluid Flow with Thermal Non-Equilibrium Approach in Vertical Channel, Journal of Nano fluids 13, 1-16 (2024) DOI: https://doi.org/10.1166/jon.2024.2182. [IF:2.7]

27. V Kumar, Ashok Kumar, Influence of periodicity on natural convection in a square porous cavity due to non-uniform heat under LTNE state, Numerical Heat Transfer, Part A: Applications, 1-17(2024), https://doi.org/10.1080/10407782.2024.2357591. [IF:2.8]

28. A Kumar, A Saini,Ashok Kumar, AS Negi, Influence of Thermal Wall and Velocity Slips on Non-Darcy MHD Boundary Layer Flow of a Nanofluid over a Non-linear Stretching Sheet, J. Phys.: Conf. Ser. 2844, 012018(2024) DOI 10.1088/1742-6596/2844/1/012018

29. A Kumar, A Saini, Ashok Kumar, AS Negi, A LTNE approach on the study of transverse hydromagnetic on mixed convection in a channel, J. Phys.: Conf. Ser. 2844, 012015(2024) DOI 10.1088/1742-6596/2844/1/012015.

30. Negi, A. S., Kumar, B., Kumar, A., Rawat, S. K., and Yaseen, M., Investigation of heat flux and heat source/sink effect on heat transfer ferrofluid (CoFe2O4-H2O) flow in an induced magnetic field with porous medium within the horizontal channel. International Journal of Ambient Energy, 46(1), (2025). https://doi.org/10.1080/01430750.2024.2447939. SCIE.

31. Vipin Kumar and Ashok Kumar, Natural convection in an anisotropic porous cavity with internal heat generation, Fluid Dynamics Research,57, (2025), 035508 . [IF:1.1]

- **Papers published in Conference Proceedings:**

1. Ashok Kumar, J. Kumar and P. Bera, "Natural convection in anisotropic porous enclosure with heating by sinusoidal temperature profile on one side", pp. 624-631, published in the proceedings of **34th National Conference on Fluid Mechanics and Fluid power**, BIT Mesra, India, Dec. 10-12 (2007).

2. J. Kumar, Ashok Kumar and P. Bera, "Stability of buoyancy assisted mixed convection in a vertical channel and its dependency on thermal conductivity", pp. 566-573, published in the proceedings of **34th National Conference on Fluid Mechanics and Fluid power**, BIT Mesra, India, Dec. 10-12 (2007).

3. P.Bera and Ashok Kumar, "Analysis of least stable mode of Buoyancy assisted mixed convective flow in vertical pipe filled with porous medium", proceeding of **World congress on Engineering 2011**, 6-8 July, 2011 (Imperial College, London),

4. P. Alam and Ashok Kumar, "Influence of aspect ratio on natural convective flow in a rectangular porous cavity due to sinusoidal temperature on the upper wall", 2^{nd} **Regional Conference on Applied and Engineering Mathematics (RCAEM–II)**, pp. 624-628, 30-31 May, 2012, Malasiya.

5. Ashok Kumar "Linear Stability of Poiseuille Flow in a Vertical Pipe Filled with Porous Medium" proceeding of **World congress on Engineering 2014**, 2-4 July, 2014 (Imperial College, London),

6. Ku. Renu Sundriyal, Ashok Kumar and Vidit Vats, "Analytical and Numerical approach on convective flow in partially heated channel filled by porous media" **AIP Conference Proceedings 1975, 030014 (2018)**
DOI: 10.1063/1.5042184

- **Abstract Published in Conference Proceedings:**

1. Ashok Kumar, J. Kumar and P. Bera, "Double-diffusive natural convection in anisotropic porous enclosures due to equal and non-uniform temperature and concentration at the bottom wall", presented in the national conference on mathematical modeling and simulation, Jiwaji University, Gwalior and ABP-IIITM Gwalior, Jan. 09-11 (2009).

Invited Talks:

1. 2nd Regional Conference on Applied and Engineering Mathematics(RCAEM-II) Malasiya, "Influence of aspect ratio on natural convective ow in a rectangular porous cavity due to sinusoidal" 30-31 May, 2012.

2. Regional Seminar on development in mathematics and its application, **Government Degree College Karanprayag (Chamoli) Uttarakhand** on 05-12-2013.

3. National conference on role of mathematics in sustainable development, **Government Degree College Karanprayag (Chamoli) Uttarakhand** on 17-10-2014.

4. DST Inspire Program 2014 - 2015, H N B Garhwal University Srinagar, on 15-12-2014.

5. DST Inspire Program 2014 - 2015, H N B Garhwal University Srinagar, on 22-12-2014.

6. DST Inspire Program 2015 - 2016, H N B Garhwal University Srinagar, on 19-01-2015.

7. DST Inspire Program 2015 - 2016, H N B Garhwal University Srinagar, on 20-01-2015.

8. DST Inspire Program 2015 - 2016, H N B Garhwal University Srinagar, on 23-12-2015.

9. DST Inspire Program 2015 - 2016, H N B Garhwal University Srinagar, on 31-12-2015.

10. Induction Programme, Jawahar Navodaya Vidyalaya Pokhal, Tehri (Garhwal) Uttarakhand on 16-05-2016.

11. DST Inspire Program 2016 - 2017, H N B Garhwal University Srinagar, on 20-01-2016.
12. DST Inspire Program 2016 - 2017, H N B Garhwal University Srinagar, on 02-02-2016.
13. 19th Annual Confrence of VIJNANA PARISAD of INDIA, on RAMMSA-2016 on 10-09-2016.
14. DST Inspire Program 2016 - 2017, H N B Garhwal University Srinagar, on 20-01-2017.
15. DST Inspire Program 2016 - 2017, H N B Garhwal University Srinagar, on 30-01-2017.
16. DST Inspire Program 2016 - 2017, H N B Garhwal University Srinagar, on 11-02-2017.
17. DST Inspire Program 2016 - 2017, H N B Garhwal University Srinagar, on 17-03-2017.
18. National Conference on Promoting the Advancement of applied Sciences Linear Stability of Buoyancy Opposed non- isothermal Poiseuille Flow in a Vertical Pipe Filled with Porous Medium, 22-10-2019.
19. DST Inspire Program 2018 - 2019, H N B Garhwal University Srinagar.
20. DST Inspire Program 2019 - 2020, H N B Garhwal University Srinagar.
21. Capacity Building Programme for the KRPs of Bihar of Higher Secondary Level in Mathematics , Regional Institute of Education (NCERT) Bhubaneswar, "Function, Limit, and Continuity", 21-01-2020
22. Capacity Building Programme for the KRPs of Bihar of Higher Secondary Level in Mathematics , Regional Institute of Education (NCERT) Bhubaneswar, " Differentiability and Its Applications", 22-01-2020
23. Capacity Building Programme for the KRPs of Bihar of Higher Secondary Level in Mathematics , Regional Institute of Education (NCERT) Bhubaneswar, "Integral Calculus and Its Applications", 23-01-2020
24. Capacity Building Programme for the KRPs of Bihar of Higher Secondary Level in Mathematics, Regional Institute of Education (NCERT) Bhubaneswar, "Differential Equations", 24-01-2020
25. Capacity building of State Resource Group (SRGs) of Northern Region on the use of Learning Outcomes through ICT integrated pedagogy in teaching of Chemistry, Mathematics and Life Sciences" ICT based Teaching of "ICT based teaching of Differential Calculus", 19-01-2022, NCERT (RIE Ajmer)
26. Capacity building of State Resource Group (SRGs) of Northern Region on the use of Learning Outcomes through ICT integrated pedagogy in teaching of Chemistry, Mathematics and Life Sciences" ICT based Teaching of "ICT Based Teaching on Integral Calculus", 20-01-2022, NCERT (RIE Ajmer)

27. Capacity building of State Resource Group (SRGs) of Northern Region on the use of Learning Outcomes through ICT integrated pedagogy in teaching of Chemistry, Mathematics and Life Sciences" ICT based Teaching of "Integral Calculus-II", 21-01-2022, NCERT (RIE Ajmer)

28. Guest Lecture in SGRR (PG) College on Introduction to MATLAB and Its Applications, on 21-09-2022.

29. ATAL FDP "Mathematical Modelling of Differentially Rotating Stars in Stellar System" sponsored by AICTE Training and Learning (ATAL) Academy Graphic Era University Dehradun, on "Chebyshev-Spectral-Collocation Method in MATLAB" During 30-10-2022 to 11-11-2022.

30. Expert in session on the Academy of Mathematical Sciences and its prospect for Uttarakhand state in Rural Science Congress under the aegis of 17th Uttarakhand State Science and Technology Congress-2023 at Vigyan Dham, Jhajra, Dehradun (Uttarakhand) scheduled from 10th February to 12th February 2023.

31. Faculty Development Program at Sridev Suman Uttarakhand University, on "MATLAB and Its Applications in AI and ML", during 16-08-2023 to 21-08-2023.

32. International Conference on Advancements in Mathematics organized by Thapar Institute of Engineering and Technology Patiala, on "Linear Stability of Non-Darcy Flow in Linear Heated Vertical Pipe Filled with Porous Medium", during 28-09-2023 to 30-09-2023.

33. 5th International Conference on Recent Advancement in Physical Sciences (NCRAPS-2023) at NIT Uttarakhand on "Non-Darcy mixed convective flow in vertical shaped pipe and its Stability", during 19-12-2023 to 20-12-2023.

34. ICETSAST-2024, Noida, organized by Society For Development Of Innovative Research in Science and Education, Maa Shakumbari Trust, Greater Noida, on "Spectral-Collocation Approach on hydrodynamic stability in a pipe filled with a porous medium", during 24-02-2024 to 25-02-2024.

35. 2nd International Conference on Computational and Mathematical Methods in Applied Sciences , organized by Uttaranchal University Dehradun, on "Linear theory of hydrodynamic stability of non-Darcy Poiseuille flow in pipe", 29-03-2024

36. International ICNAA-2024 at Sridev Suman Uttarakhand University, on "Linear stability of non-Darcy Poiseuille flow in pipe using normal mode analysis", during 10-05-2024 to 12-05-2024.

37. International International Conference on Connecting Ancient Indian Wisdom in Modern Contexts at Sridev Suman Uttarakhand University, on "Ancient Indian Knowledge in Fluid dynamics", from 11-06-2024 to 12-06-2024.

38. State DRG Maths DIET Charigaon Pauri Uttarakhand, on ICT Tools in Mathematics Education, during 08-07-2024 to 08-07-2024.

39. National Short-Term Training Program on MATLAB, at CSSR & SRRM Degree & PG College Kamalapuram Kaddapa (A.P.), on Solution of ODE& PDE in MATLAB Using Chebyshev-Spectral-Collocation Method, during: 02-12-2024 to 07-12-2024.

40. Faculty Development Program (FDP) on "Recent Advancement in Fluid Mechanics and Optimisation (RAFMO-2025)" organized by Department of Mathematics, AIAS, Amity University Jharkhand, Ranchi, on Introduction to linear Stability Analysis of Non-Darcy mixed Connective flow in aVerticalPipe, during: 14th to 18th July 2025.

I declare that the statements made and documents uploaded in the application form are true to the best of my knowledge and belief. If any information is found to be incorrect, my candidature is liable to be canceled and that I may be subject to legal / disciplinary proceedings.

(Dr. Ashok Kumar)