Dr. Muhammad Imran

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Given Name	Muhammad Imran
Father Name	Khudah Bukhsh
Permanent Address	Bilal Colony Near Bilal Masjid Chowk F.F.C, p/o F.F.C, Tehsil Sadiq Abad, Rahim Yar Khan, Pakistan
Nationality	Pakistani
Date of Birth	April 15, 1989
C.N.I.C No	31304-6844132-3
Gender	Male

EDUCATION/ACADEMIC DEGREES

Ph. D. (2021)**:** Department of Mathematics
The Islamia University of Bahawalpur, Pakistan.
Major Field: Applied Mathematics (Fluid Mechanics)
Thesis Title: Analysis of fluid motion due to curved oscillatory geometries

M.Phil. (2017)**:** Department of Mathematics
The Islamia University of Bahawalpur, Pakistan
Major Field: Applied Mathematics (Fluid Mechanics)
Thesis Title: Flow of Carreau fluid in a curved channel with convective heat transfer

M. Sc. (2014)**:** Department of Mathematics
The Islamia University of Bahawalpur, Pakistan
Major Field: Applied Mathematics

B.Sc. (2012)**:** The Islamia University of Bahawalpur, Pakistan
Major Subjects: Mathematics A, B & Physics

RESEARCH AREA(S)

- Fluid Mechanics
- Newtonian and non-Newtonian fluids
- Nanofluid Simulation
- Hybrid and Ternary Hybrid Nanofluid Simulations
- Magnetohydrodynamics (MHD)
- Heat and Mass Transfer Analysis

- Computational Fluid Dynamics
- Flow analysis through curved geometries.
- Flow analysis through oscillatory geometries
- Analytical Simulation
- Numerical Simulation

TEACHING/RESEARCH EXPERIENCE

- Since January 2023: ***Assistant Professor (TTS).*** University of Education, Lahore, Vehari Campus.
- September 2022-December 2022: ***Visiting Assistant Professor.*** National College of Business Administration & Economics, Rahim Yar Khan Campus.
- April 2015-December 2022: ***Secondary School Educator (SSE-Math) (BS-16).*** Govt. of Punjab School Education Department, Sadiq Abad, Rahim Yar Khan.
- October 2016-July 2017: ***Visiting Lecturer.*** MTB College Sadiq Abad.

COURSES TAUGHT AT UNDERGRAD/GRAD/POST GRAD

1. Elementary Linear Algebra
2. Introduction to Fluid Dynamics
3. Ordinary Differential Equations
4. Partial Differential Equations
5. Numerical solution for ODEs
6. Theory of Differential Equations
7. Vector and Tensor Analysis
8. Advanced Fluid Dynamics
9. Group Theory
10. Linear Algebra
11. Numerical Analysis
12. Analytic Geometry
13. Calculus and Analytic Geometry
14. Complex Analysis
15. Research Methodology

COMPUTER SKILLS

1. MS Word/MS PowerPoint
2. Mathematica, MATLAB

Conference/ Workshops/ Seminar/Training

- Ist International Conference on “Recent Developments in Fluid Mechanics” 28-29

March 2022, The Islamia University of Bahawalpur, Pakistan (**Participant**)

- 2nd International Conference on "Recent Advances in Mathematics" 04-05 December 2023, University of Education, Lahore, Pakistan **(Organizer)**

- 3rd International Conference on "Recent Advances in Mathematics" 16-17 April 2025, University of Education, Lahore, Pakistan **(Organizer)**

- Seminar on Applied Mathematics, "Flow and Heat Transfer in a Finned Annulus of Elliptic Circular Heat Exchanger", 26 October 2023, University of Education, Lahore (Vehari Campus), Pakistan (**Organizer**)

- Seminar on Applied Mathematics, "Hybrid Compact Stars Model in Rastall Gravity: A Comparative Study", 19 September 2024, University of Education, Lahore (Vehari Campus), Pakistan (**Organizer**)

- Virtual Seminar on Pure and Applied Mathematics, "Fixed Points of Symmetric Contraction and Their Applications", 31 October 2024, University of Education, Lahore (Vehari Campus), Pakistan (**Organizer**)

- Seminar on Applied Mathematics, "Simulation of Laminar and Fully Developed Flow in a Double Pipe Heat Exchanger with Diamond Fins", 28 November 2024, University of Education, Lahore (Vehari Campus), Pakistan (**Organizer**)

- One-Day Workshop, "Numerical Methods and Their Applications in Scientific Computing", 17 December 2024, Bahauddin Zakariya University (BZU), Multan (Vehari Campus), Pakistan (**Resource Person**)

Professional Interest

Fluid Mechanics, Flow over curved oscillatory and moving geometries (including curved surface, curved channel, and curved Riga surface), Newtonian / non-Newtonian fluids, heat and Mass Transfer Analysis, solving differential equations analytically by Homotopy Analysis Method (HAM) and numerically by Finite difference method, specifically Keller Box Method, Shooting method along with Runge-Kutta Algorithm.

BS Supervision

1. **Ali Raza (2019-2023).** Effects of heat production in hydromagnetic flow of couple stress fluid towards oscillatory stretching sheet in the presence of porous medium.
2. **Hassan Iqbal (2019-2023).** Heat and Mass transfer analysis in hydromagnetic oscillatory flow of viscous fluid through a porous channel saturated with porous medium.

3. **Nimra Hanif (2019-2023).** Effects of velocity and thermal slip on unsteady radiative flow towards stretching sheet.
4. **Amina Mahreen (2019-2023).** On degree and entropy based topological indices of hyaluronic acid anti-cancer drug conjugates and metal organic frameworks.
5. **Fiza Aslam (2019-2023).** Analytical study of graph descriptors of some particular graph families.
6. **Adeel Ahmad (2020-2024).** Analytical study of fluid motion due to a curved oscillatory Riga surface.
7. **Iqra Saeed (2020-2024).** Analysis of Blasius flow across a stretching curved sheet.
8. **Tahira Khurshid (2020-2024).** Significance of Entropy production in hydromagnetic motion flow of Prandtl fluid towards stretching sheet.
9. **Faiza Naseem (2020-2024).** Computation of numerical results for hyperbolic Tangent fluid over a nonlinear stretchable wall.
10. **Aqsa (2020-2024).** Analysis of Cattaneo-Christov double diffusive theory in time-dependent flow over a stretching cylinder.
11. **Anam Naz (2020-2024).** Effects of nonlinear radiation and entropy optimization in hydromagnetic flow of non-Newtonian liquid over a Riga sheet with variable thermal conductivity.
12. **Aakash Shehzad (2020-2024).** Analysis of heat and mass transfer in thermally radiative flow of Maxwell fluid towards oscillatory stretching sheet.
13. **Waris Hussain (2020-2024).** Swimming of gyrotactic microorganisms in steady flow of Eyring-Powell Nanoliquid past a Riga Plate.
14. **Abdul Wahab (2020-2024).** Realistic Model of anisotropic compact stars.
15. **Muhammad Usman (2020-2024).** Quintessence compact stars model in General theory of relativity.
16. **Faisal Yamin (2020-2024).** Model of anisotropic compact stars in Tolman space-time.
17. **Jamshed Akhtar (2020-2024).** Anisotropic stellar structure with Tolman-Kuchowics spacetime.
18. **Attiq ur Reman (2020-2024).** Model of compact stars with Vidya-Tikekar type g_{rr} for anisotropic fluid.
19. **Muhammad Hamid (2021-2025).** Effects of Joule heating and viscous dissipation in viscous nanofluid flow over a thin Needle.

20. **Adeela Sarfraz (2021-2025).** Analysis of thermally radiative flow of a viscous fluid over a curved sheet.
21. **Maryam Saddiqa (2021-2025).** Effects of heat production in a chemically reactive flow of second-grade fluid due to the curved stretched wall.
22. **Sufyan Ali (2021-2025).** Numerical study for magnetized flow of Powell-Eyring nanofluid across a thin needle with nonlinear thermal radiation.
23. **Noman Ali (2021-2025).** Effects of Thermophoretic and Brownian Diffusions in viscous fluid flow over a thin needle with activation energy.
24. **Samra Ansar (2021-2025).** MHD flow of viscoelastic fluid over a curved surface with first-order chemical reaction.
25. **Ehtisham Jahangir (2021-2025).** Transport analysis in magnetized flow of Maxwell fluid towards oscillatory stretched sheet with thermal radiation.
26. **Iram Noreen (2021-2025).** Effects of gyrotactic microorganism in hydromagnetic flow of nanofluid over stretching cylinder with convective boundary conditions.
27. **Ayesha Azhar (2021-2025).** Time-dependent flow of viscous fluid over stretchable cylinder with modified Fourier and Fick model.

MS Co-supervision

1. **Tehreem Asghar (2021-2023).** Heat and mass transfer analysis in a hydromagnetic flow of hybrid nanofluid containing gyrotactic micro-organism over a curved oscillatory surface.
2. **Ayesha Mubeen (2022-2024).** Analysis of bio-convective flow of micropolar fluid containing gyrotactic microorganism on an oscillating curved surface with nonlinear thermal radiation.
3. **Tahira Nawaz (2022-2024).** Effects of thermal radiation and Joule heating in a Tangential hyperbolic fluid with activation energy through a curved channel.
4. **Ayesha Sabir (2022-2024).** Impacts of variable thermal conductivity, viscosity, and nonlinear thermal radiation in hybrid nanofluid flow over a moving thin needle.

MS Supervision

1. **Muhammad Iqbal (2023-2025).** Analysis of flow of Ree-Eyring fluid caused by the oscillation of the curved stretching surface.

2. **Saira Sultana (2023-2025).** Analytical study of heat transfer analysis in flow of Williamson fluid over a Wedge with entropy generation by using Homotopy analysis method.
3. **Waqas Ahmad (2023-2025).** Optimization of energy with non-linear thermal radiation in a flow of couple stress nanofluid on an oscillating curved surface.
4. **Muhammad Arslan (2023-2025).** Analysis of heat and mass transfer in bio-convective flow of ternary hybrid micropolar nanofluid on a nonlinear stretching curved surface.
5. **Anam Aslam (2023-2025).** Effects of thermophoresis and Brownian diffusions in cross nanofluid flow through a cone with convective boundary conditions.
6. **Aimaan Ishaq (2023-2025).** Heat and mass transfer analysis in chemically reactive nanofluid flow between parallel stretchable disks with variable thermal conductivity and diffusivity.
7. **Mubashir Hussain (2023-2025).** Effects of gyrotactic microorganisms in flow of Eyring-Powell fluid in a curved channel with activation energy.

Reviewer of International Journals

- Journal of the Brazilian Society of Mechanical Sciences and Engineering
- Heat Transfer
- Journal of Function Spaces
- Asian Journal of Pure and Applied Mathematics
- PLOS ONE
- Results in Engineering
- South African Journal of Chemical Engineering
- Multiscale and Multidisciplinary Modeling, Experiments and Design
- International Journal of Thermofluids
- Journal of King Saud University-Science
- ZAMM-Journal of Applied Mathematics and Mechanics/Zeitschrift für Angewandte Mathematik und Mechanik
- Journal of Nonlinear Mathematical Physics
- Zeitschrift für angewandte Mathematik und Physik

REFERENCES

1. **Prof. Dr. Zaheer Abbas**
   Department of Mathematics
   The Islamia University, Bahawalpur, Pakistan
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2. **Prof. Dr. Rana Muhammad Ramzan**
   Department of Mathematics
   The Islamia University, Bahawalpur, Pakistan
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3. **Dr. Muhammad Naveed**
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   University of Education Lahore, Jauharabad Campus, Pakistan
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4. **Dr. Abid Mahboob**
   Department of Mathematics
   University of Education Lahore, Vehari Campus, Pakistan
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   Phone: +923007538862

International Impact Factor Publications

1. Z. Abbas, **M. Imran,** and M. Naveed, Hydromagnetic flow of a Carreau fluid in a curved channel with nonlinear thermal radiation, Thermal Science, **(2019)** 23 (6A) 3379-3390 (I.F 1.625).

2. Z. Abbas, **M. Imran,** and M. Naveed**,** Time-dependent flow of thermally developed viscous fluid over an oscillatory stretchable curved surface, Alexandria Engineering Journal, **(2020)** 59 (6) 4377-4390 (I. F 3.732).

3. **M. Imran**, M. Naveed, Z. Abbas, and N. Salamat, Impact of Joule heating and melting on time-dependent flow of nanoparticles due to an oscillatory stretchable curved wall with heat generation, Alexandria Engineering Journal, **(2021)** 60 (4) 4097-4113 (I.F 6.626).

4. M. Naveed, **M. Imran,** and Z. Abbas, Curvilinear flow of Micropolar fluid with Cattaneo-Christov heat flux model due to oscillation of curved stretchable sheet, Zeitschrift fur Naturforschung A, **(2021)** 76 (9) 799-821 (I.F 1.712).

5. **M. Imran**, Z. Abbas, and M. Naveed, Flow of Eyring-Powell liquid due to oscillatory stretchable curved sheet with modified Fourier and Fick's model, Applied Mathematics and Mechanics (English Edition), **(2021)** 42 (10) 1461-1478 (I.F 3.918).

6. M. Naveed**, M. Imran**, Z. Abbas, and A. Nadeem, Analysis of Entropy generation and Joule heating on curvilinear flow of thermally radiative viscous due to oscillation of curved Riga surface, International Journal of Modern Physics C, **(2021)** 33 (7) (I.F 1.353).

7. M. Naveed, **M. Imran,** S. Akhtar, Z. Abbas, and S. Ullah, Dynamics of melting heat

transfer in thermally developed and chemically reactive flow of Eyring- Powell liquid through a curved channel, Ricerche di Matematica, **(2022)** 72 299-316 (I.F 1.166).

8. Z. Abbas, **M. Imran,** and M. Naveed, Impact of equally diffusive chemical reaction on time dependent flow of Casson nanofluid due to oscillatory stretchable curved surface with thermal radiation, Arabian Journal for Science and Engineering, **(2022)** 47 16059-16078 (I.F 2.9).

9. M. Naveed, **M. Imran,** and S. Gul, Heat transfer analysis in hydromagnetic flow of couple stress fluid in presence of homogeneous and heterogeneous chemical reactions over a porous oscillatory stretchable sheet. Advances in Mechanical Engineering, **(2023)** 15 (2) 16878132231155823 (I.F 2.1).

10. **M. Imran,** M. Naveed, and Z. Abbas, Dynamics of Soret and Dufour effects on oscillatory flow of couple stress fluid due to stretchable curved surface. Advances in Mechanical Engineering, **(2023)** 15 (2) 16878132231156742 (I.F 2.1).

11. **M. Imran,** M. Naveed, B. Iftikhar and Z. Abbas, Heat transfer analysis in a curvilinear flow of hybrid nanoliquid across a curved oscillatory stretched surface with nonlinear radiation, ZAMM-Journal of Applied Mathematics and Mechanics/Zeitschrift für Angewandte Mathematik und Mechanik, **(2023)** 103 (11) e202200600 (I.F 2.3).

12. **M. Imran** and M. Naveed, Analysis of thermophoretic and Brownian diffusions in hydromagnetic curvilinear flow of Carreau nanofluid with activation energy and heat generation. Results in Engineering, **(2024)** 24 103114 (I.F 7.9).

13. M. Naveed, **M. Imran,** T. Asghar**,** and Z. Abbas, Transport mechanism in chemically reactive hybrid nanofluid flow containing gyrotactic micro-organisms over a curved oscillatory surface. Applied Mathematics and Mechanics (English Edition), **(2025)** 46 (1) 117-192 (I.F 4.8).

14. **M. Imran**, M. Naveed, and M. W. Rasheed, Analysis of heat transfer in magnetized Williamson fluid over a porous curved oscillating surface: Entropy Generation. International Journal of Geometric Methods in Modern Physics, **(2025)** 22 (1) 2550087 (I.F 2.2).

15. M. Naveed, **M. Imran,** and Z. Abbas**,** Effect of chemical reaction on bioconvective flow of gyrotactic micro-organisms in hybrid nanofluid on a curved oscillating surface with thermal radiation. Arabian Journal for Science and Engineering, **(2025)** 50 20543–20562 (I.F 2.9).

16. M. Naveed, **M. Imran,** and M. Faizan Khadim, Dynamics of chemical reactions and temperature-dependent thermal conductivity in a viscous fluid over an oscillating curved surface. Science Progress, **(2025)** 108 (2) 00368504251343498 (I.F 2.9).

17. **M. Imran**, M. Naveed, M. Y. Rafiq, and Z. Abbas**,** Swimming of gyrotactic microorganisms in curvilinear flow of nanofluid in a curved oscillatory channel with Cattaneo-Christov double diffusion theory. Chinese Physics B, **(2026**) 35 (1) 014401 (I.F 1.5).

Accepted for Publication

1. M. Naveed, **M. Imran,** and Moazma Majeed, Analysis of Newtonian and Joule heating in a bioconvective Williamson nanofluid flow with gyrotactic microorganisms incorporating modified forms of Fourier's and Fick's laws. Scientia Iranica, **(2025)**.

Submitted for Publication

1. **M. Imran**, M. Naveed, and Z. Abbas**,** Analysis of Entropy production and nonlinear thermal radiation on chemically reactive flow of Prandtl fluid over curved convectively heated oscillatory stretchable surface. Continuum Mechanics and Thermodynamics.

2. **M. Imran**, and M. Naveed, Analysis of melting heat transfer with Joule heating in a chemically reactive flow of Jeffrey fluid across a curved oscillatory stretchable surface with first order chemical reaction. ZAMM-Journal of Applied Mathematics and Mechanics/Zeitschrift für Angewandte Mathematik und Mechanik, (Minor Revision).

3. M. Naveed, **M. Imran,** and Moazma Majeed, Effect of Homogeneous-Heterogeneous chemical reactions in a flow of Williamson fluid on a contracting/expanding cylinder with heat source. Advances in Mechanical Engineering.

4. **M. Imran,** M. Imran, and M. Naveed**,** Impact of thermal radiation and chemical reactions on Jeffrey nanofluid flow over an oscillatory stretchable curved Riga surface. Advances in Computational Mathematics.

5. **M. Imran,** and M. Naveed**,** Thermophoretic and Brownian motion in magnetized flow of Ree-Eyring nanofluid containing microorganisms over a curved surface by using Keller-Box method. Proceedings of the Institution of the Mechanical Engineers, Part N: Journal of Nanomaterials, Nanoengineering, and Nanosystems (**Minor Revision has been submitted**).

6. **M. Imran,** and M. Naveed**,** Significance of Soret and Dufour effects in Blasius flow of Williamson ternary hybrid nanofluid over a curved surface with thermal radiation using Keller Box technique. Heat and Mass Transfer.

7. **M. Imran**, M. Naveed, Analysis of entropy generation with activation energy on the bioconvective flow of microorganisms in an Eyring-Powell nanofluid over a curved stretching surface. Scientia Iranica, (**Minor Revision has been submitted**).

8. M. Naveed, **M. Imran**, M. Majeed, A. Mubeen, Effects of nonlinear thermal radiation in bioconvective flow of a micropolar nanofluid containing gyrotactic microorganisms over an oscillating curved surface. Biomass Conversion and Biorefinery.

9. **M. Imran**, M. Naveed, W. Ahmad, Thermophoretic and Brownian diffusions in couple stress alumina–water nanofluid flow with Soret-Dufour and nonlinear

radiation effects over a curved oscillatory stretching surface. Scientia Iranica, (**Major Revision**).

10. **M. Imran**, M. Naveed, M. Iqbal, Entropy Generation in Chemically Reactive Ree–Eyring Fluid Flow with Nonlinear Thermal Radiation and Joule Heating over a Curved Oscillatory Stretchable Surface under Convective Conditions. Thermophoresis and Brownian motion. Journal of Thermal Science.