Dr. Muhammad Asif

(Assistant Professor)
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EDUCATION:

Degree Obtained	*Institution*
PhD in Mathematics	**Department of Mathematics, University of Peshawar**
Mhil Mathematics	**Department of Mathematics, University of Peshawar**
M.Sc Mathematics	**Department of Mathematics, University of Peshawar**
B.Sc (MathA &Maths B)	**University of Peshawar**
F.Sc (Pre-Eng)	**BISE Peshawar**
SSC (Science)	**BISE Peshawar**

EXPERIENCE: **(Experience Certificate Attached)**

(i) (26-10-2009 to 31-08-2014) **Lecturer (BPS-18)**
Department of Mathematics,
University of Peshawar, Pakistan

(ii) (01-09-2014 till date) **Assistant Professor (BPS-19)**
Department of Mathematics,

University of Peshawar, Pakistan

(iii)

- 4 Years' Experience as Staff Proctor, University of Peshawar.
- 2 Years' Experience as BS- Program Coordinator, Department of Mathematics, University of Peshawar.
- Member of the Admission Committee, Semester Examination Committee, Discipline Committee, Purchase committee.
- Worked as Departmental Focal person for BS, MPhil and PhD SAR (2021-24).
- Worked as Focal Person for Prime Minister Laptop Scheme.
- Worked as Secretary for the Committee on Curriculum Revision.

(A) Research Interest

- **Qualitative Analysis of Differential Equations**
  Investigating the theoretical aspects such as existence, uniqueness, and stability of solutions to various types of differential equations.
- **Numerical Solutions of Classical and Fractional Differential and Integral Equations**
  Developing and implementing computational techniques such as Meshless and Haar wavelets collocation methods to solve both integer- and fractional-order differential and integral equations.
- **Numerical Simulation of Classical and Fractional Interface Problems**
  Solving elliptic, parabolic, and hyperbolic interface problems in both lower and higher dimensions, with special attention to discontinuities and singularities using Meshless and Haar wavelets collocation methods.
- **Numerical Modeling and Analysis of Infectious Disease Models**
  Formulating, simulating, and analyzing mathematical models of infectious disease transmission using deterministic and numerical approaches.
- **Application of Neural Networks (PINNs & ANNs)**
  Utilizing Physics-Informed Neural Networks (PINNs) and Artificial Neural Networks (ANNs) for solving ordinary and partial differential equations, as well as infectious disease models and interface problems.

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(B) **Research Grants:**

1. Higher education commission of Pakistan

   (NRPU: reference # HEC/R&D/RGA/NRPU/2025/86526) (Submitted).

   .
2. Pakistan Science Foundation Islamabad, Competitive research Programme (CRP)
   (Ref:: PSF/CRP/8/ 1263/ CP-3-2025-2001-ZNN4) (Submitted).

(C) Supervisory Experience:

MPhil Scholar Supervision:

1. Rabia Bibi (completed)
2. Samiah Anam(completed)
3. Muhammad Adil(completed)
4. Faisal Bilal (completed)
5. Umer Farooq (completed)
6. Naveed Akhter (completed)
7. Shabnam (completed)
8. Fatima (completed)
9. Tabassum (completed)
10. Farhan (completed)
11. Maria Yousaf (completed)
12. Haider Zaman (completed)
13. Ruqia Bibi (completed)
14. Jawairia Bibi (completed)
15. Afsha Haleem (completed)
16. Sadaf Gul (completed)
17. Atif Khan (in progess)
18. Amjid Khan (in progress)
19. Akhonzada Muhammad Saad

PhD Scholar Supervision

1. Gul e Rana (completed)
2. Muhammad Faheem (completed)
3. Khwaja Shamsul Haq (in progress)
4. Faisal Bilal (in progress)
5. Naveed Khan (in progress)

20. Haleem ullah
21. Syda Khush Bakht

Thesis Reviewed:

1. Title: Global dynamics and Impact of Gaussian noise intensity on the stochastic epidemic model with local fractional derivative, By Areeba Azam, University of Karachi.
2. Ttle: A hybrid method for nonlinear differential equations involving tempered fractional derivatives, By Wajeeha Farooq, University of Karachi.
3. Title: Nonlinear dynamical system for economic growth: stability analysis and simulations, By Noor-ul-Ain, University of Karachi.
4. Title: Distance Properties of Commuting Graphs over Finite Non-abelian Groups, By Husna, Kohat University of Science and Technology, Kohat.
5. Title: Non-associative semihypergroups characterized by and their neutrosophic ideals, By Hamid Ayub, by Sabir Nawaz, Kohat University of Science and Technology, Kohat.
6. Title: A Haar wavelet collocation method for black-scholes option model, By Muhammad Riaz, University of Swabi.
7. A Haar wavelet collocation method for linear and nonlinear Schordinger equation, By Muhammad Ubaid Khan, University of Swabi.
8. Title: A novel unit logistic exponential distribution with properties and applications, By Rabia Mumtaz, by Sabir Nawaz, Kohat University of Science and Technology, Kohat.
9. Title: Investigation of peristaltic flow of a Sutterby fluid in a curved channel considering the effect of heat generation and chemical reaction under slip conditions, By Warda Maham, Shaheed Benazir Bhutto, Women University, Peshawar.
10. Title: The solution of Bending of Beams problems by fuzzy Laplace Transform method using Hukuhara-differentiability with fuzzy boundary conditions, By Ms. Rabia Naheed, Shaheed Benazir Bhutto, Women University Peshawar.
11. Title: Hybrid Teaching Learning Based Optimization Method with Multi Search Operators for Global Optimization, by Sabir Nawaz, Kohat University of Science and Technology, Kohat.
12. Title: Thin film flow of the Oldroyed-B Fluid with bio-convection and activation energy, By Farhad Ahmad, City University of Science and Technology, Peshawar.
13. Title: A hybrid implementation of differential Evolution strategies for global optimization, By EID Nawaz, Kohat University of Science and Technology Kohat.

List of Publications:

1. Khawaja Shams Ul Haq, **Muhammad Asif**, Muhammad Faheem, Muhammad Ahsan, Salah Boulaaras, Qasem Al Mdallal, A computational algorithm for the numerical solution of two-dimensional telegraph interface problems, **Fractals**, 33 (2025). **(I.F 2.9).**

2. **Muhammad Asif**, Faisal Bilal, Nadeem Haider, Fahd Jarad, Robust numerical techniques for modeling telegraph equations in multi-scale and heterogeneous environments, **Journal of Applied Mathematics and Computing (Springer)**, 71(2025), https://doi.org/10.1007/s12190-025-02551-8. **(I.F 2.7).**

3. M. Waleed Ahmad Khan, Imad Khan**, Muhammad Asif,** Applications of neural networking in Eyring-Powell nanofluid dynamics on a rotating surface in a porous medium, **Alexandria Engineering Journal** (Elsevier)**,** 108(2024), 568-582, https://doi.org/10.1016/j.aej.2024.07.083. **(I.F 6.8).**

4. Muhammad Faheem, **Muhammad Asif,** Nadeem Haider, Rohul Amin, Qasem Al Mdallal**,** Hybrid Haar wavelet and meshfree methods for hyperbolic double interface problems: Numerical implementations and comparative performance Analysis, **Partial Differential Equations in Applied Mathematics (Elsevier)**, 11(2024), 100773, https://doi.org/10.1016/j.padiff.2024.100773.

5. **Muhammad Asif**, Muhammad Umar Farooq, Muhammad Bilal Riaz, Faisal Bilal,Nadeem Hiader, Numerical assessment of hyperbolic type double interface problems via Haar wavelets, **Partial Differential Equations in Applied Mathematics (Elsevier),** 10 (2024) 100665, https://doi.org/10.1016/j.padiff.2024.100665.

6. **Muhammad Asif**, Faisal Bilal, Mehnaz, Imran Khan, Qasem-Al-Mdallal, Extension of Haar wavelet technique for numerical solution of three-dimensional linear and nonlinear telegraph equations, **Partial Differential Equations in Applied Mathematics (Elsevier), 9(2024), 100618, https://doi.org/10.1016/j.padiff.2024.100618.**

7. **Muhammad Asif,** Faisal Bilal, Mehnaz, Rubi Bilal, Nadeem Haider, Shaimaa A. M. Abdelmohsenc, Sayed M Eldind. An efficient algorithm for the numerical solution of telegraph interface model with discontinuous coefficients via Haar wavelets, **Alexandria Engineering Journal, 72(2023), 275-285. https://doi.org/10.1016/j.aej.2023.03.074. (I.F 6.**626**)**

8. **Muhammad Asif,** Rohul Amin, Nadeem Haider, Imran Khan, Qasem-Al-Mdallal, Saleem Bib Said, A Hybrid Numerical Technique For Solving Three-Dimensional Second-Order Parabolic Partial Differential Equations, **Fractals, 31(2023), 2340018 (16 pages), DOI: 10.1142/S0218348X23400182. (I.F 4.555).**

9. Gul e Rana, **Muhammad Asif,** Rubi Bilal, Nadeem Haider, Qasem-Al-Mdallal. Haar wavelet collocation technique for advection-diffusion-reaction type interface models, **Journal of Function Spaces, Vol. 2022, Article ID 1541486, 15 pages,** https://doi.org/10.1155/2022/1541486. **(I.F 1.281).**

10. Imran Khan, Muhammad **Asif**, Rohul Amin, Qasem Al Mdallal , Fahd Jarad, On a new method for finding numerical solutions to integro-differential equations based on Legendre multi-wavelets collocation, **Alexandria Engineering Journal, (2021), (I.F 6.626).**

11. **Muhammad Asif**, Saeed Ullah Jan, Nadeem Haider, Qasem-Al-Mdallal, Thebet Abdeljawad, Numerical modeling of NPZ and SIR models with and without diffusion. **Result in Physics, Vol. (19), (2020) 103512, https://doi.org/10.1016/j.rinp.2020.103512. (I.F 4.565).**

12. **Muhammad Asif**, Zar Ali Khan, Nadeem Haider, Qasem-Al-Mdallal, Numerical simulation for solution of SEIR models by meshless and finite difference methods, **Chaos, Soliton and Fractals, 141 (2020) 110340, (I.F 9.922).**

13. **Muhammad Asif**, Imran Khan, Nadeem Haider, Qasem-Al-Mdallal, Legendre multi-wavelets collocation method for numerical solution of linear and nonlinear integral equations, **Alexandria Engineering Journal, (2020), (I.F 6.626).**

14. Imran Aziz, Siraj-ul-Islam, **Muhammad Asif**, Haar wavelet collocation method for three-dimensional elliptic partial differential equations, **Computer and Mathematics with Application (Elsevier), 73(2017) 2023-2034. http://dx.doi.org/10.1016/j.camwa.2017.02.034. (I.F 3.218).**

15. Rohul Amin, Kamal Shah, **Muhammad Asif**, Imran Khan, Efficient numerical technique for solution of delay Volterra-Fredholm integral equations using Haar wavelet, **Heliyon 6 (2020) e05108, https://doi.org/10.1016/j.heliyon.2020.e05108. (I.F 3.776).**

16. Rohul Amin, Kamal Shah, **Muhammad Asif**, Imran Khan, A computational algorithm for the numerical solution of fractional order delay differential equations, Applied Mathematics and Computation (Elsevier), 402(2021), https://doi.org/10.1016/j.amc.2020.125863. **(I.F 3.4).**

17. Rohul Amin, Kamal Shah, **Muhammad Asif**, Imran Khan, Faheem Ullah. An efficient algorithm for numerical solution of fractional integro-differential equations via Haar wavelet, **Journal of Computational and Applied Mathematics (Elsevier), Vol. (381), pp. 1-17, 2021. (I.F 2.872).**

18. **Muhammad Asif,** Nadeem Haider, Qasem-Al-Mdallal, Imran Khan, A Haar wavelet collocation approach for solving one and two-dimensional second-order linear and nonlinear hyperbolic telegraph equations, **Numerical Methods for Partial Differential Equations**, Vol. (36), (2020), pp. 1-20, DOI: 10.1002/num.22512. (I.F 3.568)

19. Rohul Amin, Şuayip Yüzbaş Liping Gao, **Muhammad Asif**, Imran Khan, Algorithm for the Numerical Solutions of Volterra Population Growth Model with Fractional Order via Haar Wavelet, **Contemporary Mathematics**, Volume 1, Issue 2 (2020), 54-111. **(I.F 3.568)**

20. Rohul Amin, Kamal Shah, Imran khan, **Muhammad Asif**, Efficient numerical scheme for the solution of twelfth-order boundary value problems by Haar wavelet method, **Open Physics, (2020), (I.F 1.361).**

21. Rohul Amin, Kamal Shah, Imran khan, **Muhammad Asif,** Mehdi Salimi, Ali Ahmadian, Efficient numerical scheme for the solution of tenth order boundary value problems by Haar wavelet method, **MDPI Mathematics, Vol. 8, (2020) pp-1-19,** https://www.mdpi.com/2227-7390/8/11/1874/pdf. **(I.F 2.592).**

22. Rohul Amin, Kamal Shah, **Muhammad Asif**, Imran Khan, Qasem-Al-Mdallal, Efficient Numerical Algorithm for the Solution of Eight Order Boundary Value Problems by Haar Wavelet Method, **International Journal of Applied and Computational Mathematics, 7(34), (2021),** https://doi.org/10.1007/s40819-021-00975-x**.**

23. A. Zada, G. A. Khan, **Muhammad Asif** and R. Amin, On dichotomy of autonomous Systems and boundedness of some Cauchy Problems, **International Journal of Research and Reviews in Applied Sciences, 14(3), (2013), 533-538.**

24. A. Zada, R. Amin, G. A. Khan, and **Muhammad Asif**, A characterization of dichotomy for autonomous discrete systems, **Journal of Advanced Research in Dynamical and Control Systems, Vol. 6, Issue 1, 2014, 48-55.**

25. Zada, R. Amin, T. Hussain and **Muhammad Asif**, Discrete characterization of stability and dichotomy of evolution family over finite dimensional spaces, **World Applied Sciences Journal, 27 (12): 1630-1636, 2013 (I.F 0.218).**

References:

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