MUHAMMAD FAROOQ

Qualification: PhD (Applied Mathematics)
Passport No: **AQ8968603**
Date of birth: 15/04/1974
Nationality: Pakistan
E-mail: mfarooq@uop.edu.pk, mfarooq52003@gmail.com
Cell phone/WhatsApp: 0092-333-9004846
Present Institution: Assistant Professor of Mathematics, Department of Mathematics, University of Peshawar, Post Code 25120, Khyber Pakhtunkhwa, Pakistan.

Professional Summary

I have had the privilege of working as a Mathematics Lecturer at Nisar Shaheed Degree College, Risalpur Cantt, Khyber Pakhtunkhwa, Pakistan, from January 24, 2001, to October 31, 2006. With over 18 years of teaching experience, including 12 years at the University level, I hold a Master of Science in Mathematics from the University of Peshawar, Pakistan, earned in 1999. In March 2001, I completed my PhD in "New Lanczos-Type Algorithms and Its Implementation" from the Department of Mathematical Sciences, University of Essex, Wivenhoe Park, Colchester, CO4 3SQ, United Kingdom. During my doctoral studies, I also served as a Teaching Assistant under the guidance of Professor Abdellah Salhi, instructing foundation courses for Mathematics students.

My instructional roles have spanned diverse educational institutions. At the University of Essex, UK, I taught foundational Mathematics courses, while at Nisar Shaheed Degree College, Risalpur Cantt, Pakistan, I educated FSc and BSc level students in subjects like Trigonometry, Calculus, Numbers theory, mathematical methods, mechanics and vector analysis, among others. My commitment to fostering learning led me to my current position as an Assistant Professor of Mathematics at the University of Peshawar since April 05, 2011. In this role, I have taught various Mathematics courses at different academic levels, including Numerical Analysis, Differential Equations, Linear Algebra, and Mathematics for Economics.

My dedication extends beyond the classroom, as I also mentor students in utilizing technology for educational research and provide guidance to those pursuing degrees in Computer Science, Physics, Archaeology, Geography, Urban & Rural Planning, and Criminology. As a member of the Board of Studies, Academic Council, and Senate at the University of Peshawar, I contribute to academic governance. Furthermore, I have been involved in course planning and enhancement at the Department of Mathematics, University of Peshawar, where I revamped courses like Computer Algebra System, Advanced Differential Equations, and Mathematical Biology.

Passionate about facilitating holistic student development, I approach teaching as a facilitator rather than a traditional instructor. My teaching interests encompass:

- Linear Algebra
- Group Theory
- Vector Analysis

- Numerical Analysis
- Differential Equations
- Mathematical Biology
- Calculus and Analytic Geometry

Courses Design

- Computer Algebra System,
- Advanced Differential Equations
- Mathematical Biology

Research Statement

My research interests encompass a diverse range of topics within the field of mathematics. With a background in Lancoz-type algorithms and their implementation, I have a keen interest in numerical analysis and optimization techniques. My doctoral work has provided me with a solid foundation in algorithmic development and computational mathematics.

Building upon my expertise, my current research focus centers around the dynamic field of mathematical modeling of infectious diseases. I am deeply intrigued by the application of mathematical concepts to understand the spread, control, and mitigation of infectious diseases within populations. This multidisciplinary research area allows me to combine my mathematical skills with epidemiological insights to develop models that can guide public health interventions and policy decisions.

I am also enthusiastic about exploring related areas, such as network theory and statistical analysis, to enhance the accuracy and applicability of infectious disease models. As a dedicated educator, I am driven to incorporate my research findings into my teaching, fostering a holistic learning experience for my students. Overall, my research journey reflects a commitment to harnessing the power of mathematics to address real-world challenges and contribute to the betterment of society.

My research interests include the following areas:

- Strong foundation in Lancoz-type algorithms and their implementation.
- Proficient in numerical analysis and optimization techniques.
- Experienced in algorithm development and computational mathematics.
- Expertise in mathematical modeling of infectious diseases, applying mathematical concepts to understand disease spread and control.
- Multidisciplinary approach, combining mathematical skills with epidemiological insights.
- Proficient in network theory and statistical analysis to enhance infectious disease models.
- Dedicated educator, integrating research findings into teaching for a comprehensive learning experience.
- Acive contributor to academia, serving on academic boards and councils.
- Effective communicator, capable of translating complex mathematical concepts to a wider audience.
- Committed to leveraging mathematics for real-world problem-solving and societal impact.

Skills

I possess the ability to create engaging, thought-provoking, and inventive activities that cater to the diverse interests and requirements of students. My exceptional communication and research abilities enable me to present information in diverse formats, underlining the significance of course material in real-world

contexts. With a robust teaching philosophy, I am well-versed in employing various techniques to inspire students and foster their expertise in specific domains. As a proactive team member, I excel in collaborative efforts with colleagues and cultivate meaningful connections with students. Throughout my tenure as faculty, I have consistently delivered high-quality work, earning both the respect of my employers and a favorable reputation among students. My aptitude extends to designing, coordinating, and executing research initiatives both independently and as part of a collaborative research team. Moreover, I possess adept leadership skills and the capacity to motivate research groups.

Impact Factor

RG Score: 570.2, Scopus h-index: 18

Citations

Total 787, *h*-index: 15, *i*10-index 17

Click

Google Scholar
ORCID
https://www.researchgate.net/profile/Muhammad_Farooq23/stats
https://www.webofscience.com/wos/author/record/AAE-3478-2019
SCOPUS

Teaching Experience

05/04/20101 to Date	**Assistant Professor of Mathematics** **Department of Mathematics, University of Peshawar, Khyber Pakhtunkhwa, Pakistan.** Teaching different Mathematics courses to BS, MSc, MPhil & PhD classes.
24/01/2001 to 31/10/2006	**Lecturer in Mathematics** **Nisar Shaheed Degree College Risalpur Cantt; Khyber Pakhtunkhwa, Pakistan.** Teaching Mathematics to FSc & BSc classes.

National and International Professional Association

Editorial Membership

1. Member Editorial Board of International Journal of Advances in Engineering & Technology.
2. Member Editorial Board of International Journal of Scientific & Engineering Research.

Academics

09/11/2006 to 28/03/2011	**PhD (Applied Mathematics),** Department of Mathematical Sciences, University of Essex, UK. ***Thesis title:*** New Lanczos-type Algorithms and their Implementation
01/06/1996 to	**Master of Science (Mathematics), University of Peshawar, Khyber Pakhtunkhwa, Pakistan.** ***Study emphasis:*** Group Theory, Linear algebra, Topological Space, Nonlinear Dynamics, Numerical Analysis, Complex analysis, Real analysis, Differential Equations, Mathematical Statistics.

13/09/1998	
01/08/1993 to 28/02/1996	**Bachelor of Science (Physics + Mathematics), Islamia College, Peshawar, Khyber Pakhtunkhwa, Pakistan.** ***Study emphasis:*** Calculus, Differential Equations, Analytic Geometry, Mechanics, Physics.
	Bachelor of Education (Science), Institute of Education & Research, Pakistan. ***Study emphasis:*** Methods of teaching Science subjects. Educational Psychology.

Research Publications (Journal Articles)

2023

1. R. Jan, S. Alyobi, M. Inc and **M. Farooq**, (**2023**), ''A robust study of the transmission dynamics of malaria through non-local and non-singular kernel'', in AIMS Mathematics, 8(4): 7618–7640. **(IF. 2.739)**

2021

2. MF Khan, H. Alrabaiah, S. Ullah, MA Khan, **M. Farooq**, Mustafa bin Mamat, M. Imran Asjad , (**2021**), "A new fractional model for vector-host disease with saturated treatment function via singular and non-singular operators" , in Alexandria Engineering Journal , 60 (1), 629-645. **(IF: 6.626)**

2020

3. S. Ullah, MF Khan, SAA Shah, **M. Farooq**, MA Khan & Mustafa Bin Mamat , (**2020**), "Optimal control analysis of vector-host model with saturated treatment" , in The European Physical Journal Plus , 135:839, 1-25. **(IF. 3.758)**
4. SAA Shah, MA Khan, **M. Farooq**, S. Ullah & E. O. Alzahrani , (**2020**), "A fractional order model for Hepatitis B virus with treatment via Atangana-Baleanu derivative" in Physica A: Statistical Mechanics and its Applications , 538(122636), 1-17. **(IF. 3.778)**
5. S. Ullah, M. A. Khan, **M. Farooq**, Z. Hammouch and D. Baleanu , (**2020**), "A fractional model for the dynamics of Tuberculosis infection using Caputo-Fabrizio derivative" , in Discrete and Continuous Dynamical Systems - Series S , 13(3), 975-993. **(IF. 2.425)**
6. S. Ullah, MA Khan, **M. Farooq** and E. O. Alzahrani , (**2020**), "A fractional model for the dynamics of tuberculosis (TB) using Atangana-Baleanu derivative" , in Discrete & Continuous Dynamical Systems Series-S, 13(3), 937-956. **(IF. 2.425)**
7. S. Ullah, MA Khan, **M. Farooq**, T. Gul and F. Hussain , (**2020**), "A fractional order HBV model with hospitalization" , in Discrete & Continuous Dynamical Systems Series-S , 13 (3), 957-974. **(IF. 2.425)**

8. MA Khan, SAA Shah, S Ullah, KO Okosun and **M Farooq**, (**2020**), "Optimal control analysis of the effect of treatment, isolation and vaccination on hepatitis B virus", in Journal of Biological Systems, 28(2), 351–376. **(IF. 1.909)**

2019

9. S. Ullah, MA Khan, **M. Farooq** & Taza Gul, (**2019**), "Modeling and analysis of Tuberculosis (TB) in Khyber Pakhtunkhwa Pakistan" , in Mathematics and Computers in Simulation, 165, 181-199. **(IF. 3.601)**
10. MA Khan, M Ahmad, S Ullah, **M Farooq** & T Gul, (**2019**), "Modeling the transmission dynamics of tuberculosis in Khyber Pakhtunkhwa Pakistan", in Advances in Mechanical Engineering, 11 (6) , 1-13. **(IF. 1.566)**
11. S. Ullah, MA Khan & **M. Farooq**, (**2019**), "Mathematical modelling of Hepatitis B infection with vaccination and optimal control interventions" , in Journal of Computational Methods in Sciences and Engineering, 20(1), 331-349 **(IF. 0.5)**
12. S. Ullah, M. A. Khan and **M. Farooq**, (**2019**), "Mathematical Modelling Approach to Hepatitis B virus with Vaccination and optimal control", in International Journal of Ecology and developments, 34 (3), 69-81. **(IF. 0.493)**

2018

13. **S**. Ullah, MA Khan & **M. Farooq**, (**2018**), "A new fractional model for the dynamics of Hepatitis B virus using Caputo-Fabrizio derivative", in European Physical Journal Plus, 133, 1-14. **(IF. 3.758)**
14. S. Ullah, MA Khan & **M. Farooq**, (**2018**), "A fractional model for the dynamics of TB virus", in Chaos, Solitons & Fractals, 116, 63-71. **(IF. 9.922)**
15. MA Khan, S. Ullah, & **M. Farooq**, (**2018**), "A new fractional model for tuberculosis with relapse via Atangana-Baleanu derivative", in Chaos, Solitons & Fractals, 116, 227-238. **(IF. 9.922)**
16. S. Ullah, MA Khan, **M. Farooq**, (**2018**), "Modeling and analysis of fractional HBV model with Atangana-Baleanu derivative" , in Eur. Phys. J. Plus , 133, 1-18. **(IF. 3.758)**
17. MSA Khan, S. Abdullah, MY Ali, I. Hussain and **M. Farooq**, (**2018**), "Extension of TOPSIS method based on Choquet integral under interval-valued Pythagorean fuzzy environment" , in Journal of Intelligent and Fuzzy Systems , 34 (1) , 267-282. **(IF. 2.0)**

2015-11:

18. Z. Ullah, **M. Farooq** and A. Salhi, (**2015**)", A19/B6: A new Lanczos-type algorithm and its implementation", in Journal of Prime Research in Mathematics, 10(1), 106 - 122. **(IF. 0.238)**
19. **M. Farooq** and A. Salhi, (**2014**), "A Switchting Approach to avoid Breakdown in Lanczos-type Algorithms" , in Applied Mathematics & Information Sciences , 2014 , 8(5), 2161-2169. **(IF. 0.258)**

20. **M. Farooq** and A. Salhi, (**2013**), "A Preemptive Restarting Approach to Beating the Inherent Instability of Lanczos-type Algorithms" , in Iranian Journal of Science & Technology, Transaction A-Science , 2013 , 37(3.1) , 349 – 358. **(IF. 1.553)**
21. S. Ullah, M**. Farooq** and A. Salhi, (**2013**), "An alternative derivation of a new Lanczos-type algorithm for system of linear equations" , in Punjab University Journal of Mathematics , 45, 39-49.
22. **M. Farooq** and A. Salhi, (**2012**), "New Recurrence Relationships between Orthogonal Polynomials which Lead to New Lanczos-type Algorithms" , in Journal Of Prime Research in Mathematics , 8, 61-75. **(IF. 0.238)**
23. **M. Farooq** and A. Salhi, (**2011**), "Improving the Solvability of Ill-conditioned Systems of Linear Equations by Reducing the Condition Number of their Matrices" , in J. Korean Math. Soc. 48 (5), 939 – 952. **(IF. 0.531)**

Awards

- Faculty Development Scholarship for PhD at the University of Essex, UK by Higher Education Commission, Islamabad, Pakistan.

International Assignment/Reviewer

- Computational and Mathematical Methods, Hindawi
- Computational and Mathematical Methods in Medicine, Hindawi
- Journal of Mathematics, Hindawi
- Neural Computing and Applications, Springer
- Computer Methods in Biomechanics and Biomedical Engineering, Taylor & Francis
- Frontiers in Public Health
- Symmetry, MDPI
- Fractal and Fractional, MDPI
- African Journal of Mathematics and Computer Science Research

Internal roles:

Since April 2011, I have undertaken a number of roles within the Department of Mathematics, University of Peshawar, these are briefly summarised as:

1. Looking after the Department in the absence of Head of Department (During official visits abroad or inland)

2. Co-ordinator MSc Program

3. Member Departmental Graduate Studies Committee

4. Member of the Departmental Admission Committee

5. In-charge students' affairs

6. Member of Departmental Financial Committee

7. Member of Departmental Board of Studies

8. Member Academic Council, University of Peshawar

9. Member Senate, University of Peshawar

External role(s): In addition to editorial, refereeing and assessment duties, I have also undertaken the following roles in different universities:

1. Member Board of Studies, Department of Mathematics, **Khushal Khan Khattak University, Karak**, **Khyber Pakhtunkhwa, Pakistan.**
2. Member of the Graduate Studies Committee, **Electronics Department, University of Peshawar, Khyber Pakhtunkhwa, Pakistan.**
3. Member Board of Studies, **Department of Mathematics, Abdul Wali Khan University, Mardan, Khyber Pakhtunkhwa, Pakistan.**
4. Member Advanced Studies & Research Board, **Benazir Shaheed Women University (formerly known as Frontier Women University), Peshawar**, **Khyber Pakhtunkhwa, Pakistan.**
5. Member of the Graduate Studies Committee, Department of Mathematics, **Khushal Khan Khattak University, Karak**, **Khyber Pakhtunkhwa, Pakistan.**
6. Member of the Graduate Studies Committee, Department of Mathematics, **University of Swabi**, **Khyber Pakhtunkhwa, Pakistan.**
7. Member Board of Studies, Department of Mathematics, **University of Swabi**, **Khyber Pakhtunkhwa, Pakistan.**
8. Member of National Curriculum Review Committee, Higher Education Commission, Islamabad.

Technical Skills

No.	Skill Title	Skill Level (Basic/Intermediate/Proficient)	Total Experience (years)	Last used (Year)
1	Mathematica software	Proficient	12 years	2023
2	Latex	Proficient	17 years	2023
3	MATLAB	Intermediate	15 year	2023

Others

- Security Orientation Training
- First AID training
- Training of National Cadet Course (NCC)
- LTV Driving license (Pakistani)

Sports

Cricket, and Table Tennis.

Co-curricular activities

Member of the Mathematics Society at the Department of Mathematics, University of Peshawar. I am socially active in my community and strive to make new friends and researchers. I help my colleagues and students with their daily research/academic issues.

Languages

English, Urdu (Fluent in writing, speaking, and reading), Arabic (Basic), Pashtu (Mother's tongue)

References

1). Dr. Abdellah Salhi
Professor
Department of Mathematical Sciences,
University of Essex, Wivenhoe Park, Colchester, CO4 3Sq, United KIngdom
e-mail: *as@essex.ac.uk*
Contact: 0044-7763835433

2). Dr. Imran Aziz
Professor/Chairman
Department of Mathematics, University of Peshawar
Khyber Pakhtunkhwa, Pakistan.
e-mail: imran_aziz@uop.edu.pk
Contact: 0092-3335155111

3). Dr. Israr Ahmad
Assistant Professor
General Requirements Department
College of Applied Sciences,
University of Technology and Applied Sciences
Sultanate of Oman
e-mail: israr_ahmad@utas.edu.om
Contact: 968- 96569617