CURRICULUM VITAE

Rizwan Anjum

Researchgate: https://www.researchgate.net/profile/Rizwan-Anjum;
Google Scholar: https://scholar.google.com/citations?hl=enuser=BneOhUIAAAAJ;
ORCID: https://orcid.org/0000-0002-2864-6730;;
Email: rizwananjum1723@gmail.com
Phone Number: +92321281993
Date & Place of Birth: August 22, 1993, Dipalpur, Pakistan.

Areas of Interest

1. Fixed Point Theory and Its Applications
2. Functional Analysis
3. Nonlinear Analysis

Teaching Statement

Mathematics has a dual nature: it is a gathering of beautiful ideas as well as an array of tools for practical problems. I have found that when both perspectives are emphasized in the classroom, students are better able to make crucial connections and maintain their interest. I seek to engage students in discussing and contemplating both aspects of mathematics so that they can appreciate the art and apply the analysis inherent in mathematical thought. At the graduate level, my exam questions are testing their abilities of critical thinking and establish stern arguments.

In order for students to develop a sense of mathematics as a living subject, it is important for the material in a course to connect with the work of professional mathematicians. Furthermore, mathematics surrounds us in our daily lives, and a well-trained student can find pleasure in picking out these occurrences. Thus I choose illustrations and exercises that are related to more advanced fields or to natural and cultural objects.

Teaching Experience

1. University of Education Lahore | **Assistant Professor of Mathematics** | January 2023–Present
2. Riphah International University, Lahore Campus | **Senior Lecturer in Mathematics** | November 2021–January 2023

3. Directorate of Intermediate Studies, GC University, Lahore | **Senior Visiting Faculty (Mathematics)** | August 2021–November 2021
4. ASSMS, GCU, Lahore | **Teaching Assistant (Algebraic Geometry)** for Prof. Dr. Hassan Azad | March 2020–June 2021

Education

2018–2022	Ph.D. Mathematics
	Supervisor: Prof. Dr. Mujahid Abbas
	Title of Thesis: Solution of certain Operator Equations and Inclusions by Enriching the Operator with Applications
	Abdus Salam School of Mathematical Sciences, Government College University, Lahore, Pakistan.
2016–2018	M.Phil. Mathematics
	Supervisor: Prof. Dr. Geroge. E. Karadzhov
	Title of Thesis: Rearrangement-Invariant Function Spaces
	Abdus Salam School of Mathematical Sciences, Government College University, Lahore, Pakistan.
2014–2016	M.Sc. Mathematics
	Department of Mathematics, Government College University, Lahore, Pakistan
2012–2014	B.Sc. Mathematics
	University of Punjab, Lahore, Pakistan

Courses Taught at BS Mathematics

- Advanced Calculus, Affine and Euclidean Geometry, Functional Analysis I, Multivariate Calculus, Real Analysis, Real Analysis-I, Differential Geometry, Elementary Linear Algebra, Real Analysis-II, Exploring Quantitative Skills, Measure Theory, Complex Analysis, Rings and Modules, Group Theory, Algebraic Topology, Group Theory-II, Introduction to Statistics, Calculus and Analytic Geometry

Courses Taught at MS Mathematics

- Numerical Methods, Fixed Point Theory and Applications-I, Advanced Functional Analysis, Operator Theory, Commutative Algebra

Supervision of M.S. Theses

Session 2022–2024

- **Hira Safdar** (Reg. No. 19-UE-03592)
  Operator Enrichment Techniques for Fixed Point Problems in Banach Spaces with Applications
- **Muhammad Waqar Akram** (Reg. No. 16-UE-05114)
  Fixed Point Theorems for Kannan Type Mappings with Applications
- **Muhammad Tahir Hassan** (Reg. No. 19-UE-03646)
  Convergence Analysis for Common Fixed Points of G-Nonexpansive Mappings in Banach Spaces with Directed Graphs
- **Kousar Bibi** (Reg. No. 18-UE-03830)
  Iterative Methods for Approximation of Fixed Points and Their Applications
- **Zohra Kiran** (Reg. No. 17-UE-04637)
  Fixed Point Theorems for Enriched Contractions in Fuzzy Normed Spaces

Session Fall 2023–2025

- **Maria Hasnain** (Reg. No. 22-UE-10727)
  A Study of Convergence Properties in Variational Inequalities and Fixed Point Problems
- **Nusrat Jawaria** (Reg. No. 23-UE-16658)
  Solving the Fixed Circle Problem in Banach Spaces and Its Applications to Neural Networks
- **Shahan Afzal** (Reg. No. 23-UE-16639)
  Fixed Function Theorems for Admissible Mappings in Banach Spaces and Their Applications
- **Sundas Laraib** (Reg. No. 23-UE-16657)
  The Role of Enrichment Techniques in Fixed Point Approximation for n-Polygon Perimeters
- **Syed Hasan Mujtaba** (Reg. No. 23-UE-16648)
  Fixed Point Theorems for Enriched Contractions Mappings in Fuzzy Normed Spaces

Research Publications

[1] Zhou, M., **Anjum, R.**, Din, M., Abbas, M.: On New Modified Generalized Nonexpansive Mappings With An Application To The Transverse Waves In A Homogeneous Bar. Journal of Nonlinear and Convex Analysis. Volume 26, Number 12, 2025, 3381-2308

[2] Iqbal, H., Dilawer, H., **Anjum, R.**, et al. A novel AA* method for exploring the interplay between fractals, polynomiographs, and fractional calculus. Journal of King Saud University–Science. 2025:37;2872025 https://doi.org/10.25259/JKSUS$_2$87$_2$025

[3] Ajmal, S., Iqbal, H., **Anjum, R.**, et al. On the convergence of some iterative schemes for weak contractions with applications to fractional-order blood flow models. Numer Algor (2025) https://doi.org/10.1007/s11075-025-02271-x

[4] **Anjum, R.**, Chira, M. A.: A new type of cyclic iterated function systems via enriched cyclic weak contractions. Carpathian Journal of Mathematics. Volume 41 (2025), No. 4, Pages 1079–1090 https://doi.org/10.37193/CJM.2025.04.15

[5] **Anjum, R.**, Din, M., Zhou, M. Abbas, M.: A Novel Classification Of Fractals Via Generalized (w, F)-Hutchinson Operators And Their Applications. Fractals. (2025).2540264 https://doi.org/10.1142/S0218348X25402649

[6] **Anjum, R.**, Abbas, Waqar, M. W., Yao, J. C.: New operator classes: Fixed points and Banach space characterization. Journal of Nonlinear and Convex Analysis. Volume 26, Number 2, 349-366, 2025

[7] Iqbal, H., **Anjum, R.**, Dilawer, H., Zhou, M.: Source Transformation of Electrical Power: A Klim–Wardowski (ν, F)-Type Contraction Mapping in a Graphical Metric Space Approach. Journal of Mathematics. Volume 2025, Article ID 2928138, 11 pages https://doi.org/10.1155/jom/2928138

[8] Dilawer, H., Iqbal, H. **Anjum, R.**: On G-Norm Hutchinson–Barnsley Operators and Their Convergence to Fractal Attractors. Complex Analysis and Operator Theory. 19, 73 (2025). https://doi.org/10.1007/s11785-025-01699-2

[9] **Anjum, R.**, Hussain, N., Alamri, H., Ali, B.: Fixed point existence and applications in variational inequalities via modified Ćirić-Reich-Rus contractions. Research in Mathematics (2025). https://doi.org/10.1080/27684830.2025.2535083

[10] Li, C., Cui, Y., **Anjum, R.**: Best proximity points for weak proximal enriched gcontractions in graphical convex metric spaces, Journal of Applied Analysis and Computation, Volume 15, Number 4, August 2025, 2392-2407 http://dx.doi.org/10.11948/20240484

[11] Zhou, M., **Anjum, R.**, Guo, L., Din. M., Cho, Y. J.: Equivalence and convergence analysis of fixed point iterative schemes using higher order averaged mappings. Numerical Algorithms (2025). https://doi.org/10.1007/s11075-025-02080-2

[12] Dilawer, H., **Anjum, R.**, Iqbal, H., Zhou, M.: Exploring the existence of a solution of nonlinear Fredholm integral equations: Novel approaches to estimating common fixed points. Journal of King Saud University–Science. 2025:37;2662025 10.25259/$JKSUS\_266\_2025$

[13] Khan, S.H.; **Anjum, R**; Ismail, N.: Introducing Monotone Enriched Nonexpansive Mappings for Fixed Point Approximation in Ordered CAT(0) Spaces. Computation 2025, 13, 81. https://doi.org/10.3390/computation13040081

[14] **Anjum, R**., Din, M., Zhou, M.: Fractals of two types of enriched (q, θ)-Hutchinson–Barnsley operators, Chaos, Solitons & Fractals, Volume 181, 2024, 114589, https://doi.org/10.1016/j.chaos.2024.114589

[15] **Anjum, R**., Safdar, H.: Asymptotic Regularity of Generalized Averaged Mappings in (M, K, ψ)-HR-Ćirić-Reich-Rus Contractions, Carpathian Journal of Mathematics. Volume 40 (2024), No. 3, Pages 569–579 https://doi.org/10.37193/CJM.2024.03.01

[16] **Anjum, R**., Abbas, Waqar, M. W., Radenović, S.: Existence of fixed points of large MR-Kannan contractions in Banach Spaces. Applied General Topology. vol. 25, no. 2, pp. 423–439, Oct. 2024. https://doi.org/10.4995/agt.2024.20852

[17] **Anjum, R**., Fulga, A., Akram, M.W.: Applications to Solving Variational Inequality Problems via MR-Kannan Type Interpolative Contractions. Mathematics 2023, 11, 4694. https://doi.org/10.3390/math11224694

[18] **Anjum, R**., Abbas, M., Safdar, H., Din, M., Zhou, M., Radenović, S.: Application to Activation Functions through Fixed-Circle Problems with Symmetric Contractions. Symmetry 2024, 16, 69. https://doi.org/10.3390/sym16010069

[19] **Anjum, R**., Khan, S.H. Equivalence of certain iteration processes via averaged mappings. The Journal of Analysis (2023). https://doi.org/10.1007/s41478-023-00679-z

[20] **Anjum, R**., Ismail, N., Bartwal, A.: Implication between certain iterative processes via some enriched mappings. The Journal of Analysis. (2023). https://doi.org/10.1007/s41478-023-00558-7

[21] **Anjum, R**., Abbas, M., Işık, H.: Completeness Problem via Fixed Point Theory. Complex Anal. Oper. Theory. 17, 85 (2023). https://doi.org/10.1007/s11785-023-01385-1

[22] Abbas, M., **Anjum, R**., Tahir, M.H.: Fixed point theorems of enriched multivalued mappings via sequentially equivalent Hausdorff metric , Topological Algebra and its Applications, vol. 11, no. 1, 2023, pp. 20220136. https://doi.org/10.1515/taa-2022-0136

[23] Abbas, M., **Anjum, R**., Anwar, R.: A note on the fixed point theorem of Fcontraction mappings in rectangular M-metric space. Applied General Topology. vol. 24, no. 2, pp. 343–358, Oct. 2023. https://doi.org/10.4995/agt.2023.18557

[24] Abbas, M., **Anjum, R**., Riasat, S.: Solution of integral equation involving interpolative enriched cyclic Kannan contraction mappings, Bangmod International Journal of Mathematical and Computational Science, 9, 1–9. 2023 https://doi.org/10.58715/bangmodjmcs.2023.9.1

[25] **Anjum, R**., Abbas, M., Agarwal, R. P.: Fixed Points of Enriched Condensing Operators in Ordered Banach Spaces, Dynamic Systems and Applications 32 (2023) 314-331 https://doi.org/10.46719/dsa2023.32.17

[26] Abbas, M., **Anjum, R.**, Riasat, S.: Fixed point results of R-enriched interpolative Kannan pair in R-convex metric spaces , Creative Mathematics and Informatics , 32(1), 01–11, 2023. https://doi.org/10.37193/CMI.2023.01.01

[27] Abbas, M., **Anjum, R.**, Anwar, R.: On fourth order differential equations via θ-contractions, International Journal of Innovations in Science & Technology 43, (2022) 867-880

[28] Abbas, M., **Anjum, R.**, Riasat, S.: Fixed point results of enriched interpolative Kannan type operators with applications. Applied General Topology. 23(2), 391–404, 2022. https://doi.org/10.4995/agt.2022.16701

[29] Abbas, M., **Anjum, R.**, Ismail, N.: Approximation of fixed points of enriched asymptotically nonexpansive mappings in CAT(0) spaces. Rend. Circ. Mat. Palermo, II. Ser (2022). https://doi.org/10.1007/s12215-022-00806-y

[30] Abbas, M., **Anjum, R.**, Riasat, S.: A new type of fixed point theorem via interpolation of operators with application in homotopy theory. Arabian Journal of Mathematics. (2022). https://doi.org/10.1007/s40065-022-00402-z

[31] Abbas, M. **Anjum, R.**, Iqbal, H.: Generalized enriched cyclic contractions with application to generalized iterated function system Chaos, Solitons and Fractals, 154(3) (2022) https://doi.org/10.1016/j.chaos.2021.111591

[32] **Anjum, R.**, Abbas, M.: Common Fixed point theorem for modified Kannan enriched contraction pair in Banach spaces and its Applications, Filomat. 35(8) (2021), 2485–2495 https://doi.org/10.2298/FIL2108485A

[33] Abbas, M., **Anjum, R.**, Berinde, V.: Enriched multivalued contractions with applications to differential inclusions and dynamic programming, Symmetry 13(8), (2021) 1350. https://doi.org/10.3390/sym13081350

[34] Abbas, M., **Anjum, R.**, Berinde, V.: Equivalence of Certain Iteration Processes Obtained by Two New Classes of Operators, Mathematics. 918, (2021) 2292. https://doi.org/10.3390/math9182292

[35] **Anjum, R.**, Abbas, M.: Fixed point property of a nonempty set relative to the class of friendly mappings., RACSAM. 32(116), (2022). https://doi.org/10.1007/s13398-021-01158-5

[36] Abbas, M., **Anjum, R.**, Rakoćcević, V.: A generalized Suzuki Bernide contraction that characterizes Banach spaces, Journal of Applied Analysis, 2022. https://doi.org/10.1515/jaa-2022-2007

Conference/Workshops/Symposium Presentations as a Speaker

[1] **National Keynote Invited Speaker**, 8th UMT International Conference on Pure and Applied Mathematics (8th UICPAM-2025), University of Management and Technology (UMT), Lahore, Pakistan, April 14-16, 2025.

[2] **National Invited Speaker**, 20th Conference on Recent Advances in Mathematical Methods, Models, and Applications, Lahore School of Economics, Lahore, Pakistan, April 19–20, 2025

[3] **National Keynote Invited Speaker**, International Symposium on Emergining Trends in Fixed Point Theory and Optimization, University of Southern Punjab, Multan, Pakistan, March 16, 2025

[4] **National Keynote Invited Speaker**, 2nd International Symposium on Recent Trends in Mathematical Analysis with Applications, University of Management and Technology (UMT), Lahore, Pakistan, June 12, 2024

[5] **National Keynote Invited Speaker**, 2nd Workshop on Advancements in Mathematics & its Applications, Department of Mathematics, Riphah International University, Gulberg III, Lahore, Pakistan, June 07-09, 2024

[6] **National Invited Speaker**, 19th Conference on Recent Advances in Mathematical Methods, Models, and Applications, Lahore School of Economics, Lahore, Pakistan, March 2-3, 2024

[7] **National Keynote Invited Speaker**, 7th UMT International Conference on Pure and Applied Mathematics (7th UICPAM-2023), University of Management and Technology (UMT), Lahore, Pakistan, December 4-5, 2023

Seminar Presentations

[1] *Solution of certain Operator Equations and Inclusions by Enriching the Operator with Applications*, March 08, 2022, Main Hall, ASSMS, GCU, Lahore.

[2] *Fixed point property of a nonempty set relative to the class of friendly mappings*, October 14, 2021, Main Hall, ASSMS, GCU, Lahore.

[3] *An introduction to fixed point theory*, November 19, 2020, Main Hall, ASSMS, GCU, Lahore.

[4] *An introduction to ergodic theory*, December 17, 2019, Main Hall, ASSMS, GCU, Lahore.

[5] *An introduction interpolation spaces*, October 10, 2019, Main Hall, ASSMS, GCU, Lahore.

[6] *On basic concepts of functional analysis and Interpolation theory for quasi normed spaces*, August 2, 2018, Main Hall, ASSMS, GCU, Lahore.

[7] *Rearrangement-invariant function spaces*, May 2, 2018, Main Hall, ASSMS, GCU, Lahore.

Workshop/Conference/Symposium/Seminar/Intensive Courses Attended

[1] 2^{nd} *International Confernce on Recent Advances in Mathematics* , December 04-05, 2023, University of Education, Lahore, Pakistan

[2] *One day National Workshop on Latest Trends in Computational Mathematics and its Applications* , July 29, 2021, ASSMS, GCU, Lahore.

[3] *Classical and Constructive Nonassociative Algebraic Structures: Foundations and Applications-CaCNAS:FA 2021* June 30 – July 02, 2021, ASSMS, GCU, Lahore

[4] *Workshop on Symmetry & Supersymmetry : An Algebraic Approach*, January 31 – February 1, 2020, Sukkur IBA University, Sukkur.

[5] *Differential Equations and Manifolds - Symmetries, Conservation Laws, and Applications*, delivered by Abdul Hamid Kara (South Africa) January 07 - 13, 2020, Main Hall, ASSMS, GCU, Lahore.

[6] *Fractal Geometry - with a view towards Number Theory and Dynamics*, delivered by Simon Kristensen (Denmark), February 05 -26, 2020, Main Hall, ASSMS, GCU, Lahore.

[7] *Quantum sl(2) : Algebraic Structure and Topological Applications*, delivered by Christian Blanchet (France), February 28 – March 13, 2020, Main Hall, ASSMS, GCU, Lahore.

[8] *Advanced Methods for Studying Non-smooth and Smooth Dynamical Systems*, delivered by Dimitar Kolev (Bulgaria), March 02 – March 13, 2020, Class Room, ASSMS, GCU, Lahore.

[9] *An Introduction to Dirichlet L-functions*, delivered by Karl Dilcher (Canada), February 10-21, 2020, Main Hall, ASSMS, GCU, Lahore.

[10] *Introduction to Representation Theory of p-adic Groups*, delivered by Nadir Matringe (France), February 24 – March 13, 2020, Main Hall, ASSMS, GCU, Lahore.

[11] *Singularities*, delivered by Gerhard Pfister (Germany), October-November, 2019, Main Hall, ASSMS, GCU, Lahore.

[12] *Algebra, Analysis and their Applications*, December 2, 2019, GCU, Lahore.

[13] *Sixth Italian-Pakistani Workshop on Relativistic Astrophysics*, January 24-26, 2019, School of Natural Sciences (SNS), National University of Sciences and Technology (NUST), H-12, Islamabad.

[14] *Clifford Algebras and Spin Groups*, delivered by Johann Davidov (Bulgaria), November 2018 - May 2019, Class Room, ASSMS, GCU, Lahore.

[15] *Lie algebras, quantum groups and their representations: the sl(2) example*, delivered by Christian Blanchet (France), November 2019, Main Hall, ASSMS, GCU, Lahore.

[16] *Topics in Complex Analysis*, delivered by Rein Leo Zeinstra (Germany), March 12 - April 24, 2019, Main Hall, ASSMS, GCU, Lahore.

[17] *Differential Forms - An Introduction*, delivered by Johann Davidov (Bulgaria), October-December 2019, ASSMS, Main Hall, GCU, Lahore.

[18] *Second Winter Workshop on Advanced Topics in Mathematics: Analysis and Dynamics in Number Theory*, December 13-18, 2018, ASSMS, GCU, Lahore.

[19] *The Theory of General Relativity-Basic Notions Seminars*, delivered by Amer Iqbal, January - March 2018, ASSMS, GCU, Lahore.

[20] *Quantum Mechanics for Quantum Information & Quantum Computations*, delivered by Amer Iqbal, January 23, 2018, ASSMS, GCU, Lahore.

[21] *Sobolev Spaces*, delivered by Georgi Karadzhov (Bulgaria), February-May 2018, Main Hall, ASSMS, GCU, Lahore.

[22] *Introduction to the Lebesgue Integral and Measure Theory*, delivered by Rein Leo Zeinstra (Germany), April 2018, Main Hall, ASSMS, GCU, Lahore.

[23] *Topologies and Completions*, delivered by Tiberiu Dumitrescu (Romania), November-December 2018, Class Room, ASSMS, GCU, Lahore.

[24] *Weekly ASSMS Seminar Series*, Main Hall, ASSMS, GCU, Lahore.

[25] *Algebraic Approach to the Chordality of Hypergraphs*, December 2018, ASSMS, GCU, Lahore.

[26] *2018 International Conference on Mathematics and Its Applications*, November 13-15, 2018, GCU, Lahore.

[27] *Algebraic Geometry and Its Applications*, August 27-30, 2018, Library Basement, ASSMS, GCU, Lahore.

[28] *Information, Black Holes and Quantum Physics, Theoretical Physics at the Crossroads*, March 26-30, 2018, ASSMS, GCU, Lahore.

[29] *CASM Workshop "Topics in Topology"*, Febuary 22-24, 2018, ASSMS, GCU & LUMS, Lahore.

[30] *First Winter Workshop on Advanced Topics in Mathematics: Commutative Algebra and Banach Space Theory*, December 26-29, 2017, ASSMS, GCU, Lahore.

[31] *Workshop on Contemporary Topics in Analysis, Algebra and Geometry*, August 15-19, 2017, ASSMS, GCU, Lahore.

[32] *Symposium on Recent Developments in Theoretical Physics*, delivered by Asghar Qadir, November 22, 2017, Main Hall, ASSMS, GCU, Lahore.

[33] *Tensor and Exterior Products of Vector Spaces*, delivered by Johann Davidov (Bulgaria), November-December 2016, Main Hall, ASSMS, GCU, Lahore.

Professional Development Program

[1] Participated in a professional development program for UE Faculty-Batch 02 focusing on "Project Writing: How to write a Win-Win Scientific Proposal" held from July 31 to August 1, 2023.

Awards and Skills

1. "Best teacher(Undergraduate) Award" for outstanding performance being teacher Mathematics Department of RICAS, Riphah International University, Lahore Campus in year (2021-22).
2. "Outstanding Performance Award" during Ph.D course work (Batch-12)(Session 2018-21) .
3. "Outstanding Performance Award" during M.Phil course work (Batch-12)(Session 2016-18).
4. Member of committee in organizing the event Nonassociative Algerbiac Structure Foundations and Applicaton (June 30-July 2, 2021) at Abdus Salam School of Mathematical Sciences, GC University Lahore.
5. Member of committee in organizing the event One day National Workshop on Latest Trends in Computational Mathematics and its Applications (July 29, 2021) at Abdus Salam School of Mathematical Sciences, GC University Lahore.
6. Critical & Imaginative Thinking, Patience, Good Communication, Time Management, Problem Solving.

References

1. Professor Mujahid Abbas, Department of Mathematics, Government College University Katchery Road, Lahore 54000, Pakistan and Department of Mathematics and Applied Mathematics, University of Pretoria Hatfield 002, Pretoria, South Africa (abbas.mujahid@gmail.com)
2. Professor Georgi E. Karadzhov, Department of Differential Equations and Mathematical Physics, Bulgarian Academy of Sciences (georgikaradzhov46@gmail.com)

2. Professor Fiazud Din Zaman, Director Academics, Abdus Salam School of Mathematical Sciences, Government College University, Lahore (f.zaman@sms.edu.pk)