

CURRICULUM VITAE

Rizwan Anjum

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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. Assistant Professor in the Mathematics Department of University of Education Lahore, Jauharabad Campus (Jauharabad), Pakistan (Jan 2023-Present)
2. Senior Lecturer in the Mathematics Department of Riphah International University, Lahore Campus, Pakistan (Nov 2021-Jan 2023)

3. Senior Visiting Faculty (Mathematics) to teach Intermediate classes, Directorate of Intermediate Studies, GC University, Lahore (Aug 2021-Nov 2021)
4. Four months of teaching experience assisting the course in Algebraic Geometry for Prof. Dr. Hassan Azad, Mar 2020-Jun 2021, ASSMS, GCU, Lahore

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

Courses Taught at MS Mathematics

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

Research Publications

- [1] **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
- [2] **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>
- [3] **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>
- [4] 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/bangmodjms.2023.9.1>
- [5] **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>
- [6] **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>
- [7] Abbas, M., **Anjum, R.**, Anwar, R.: A note on the fixed point theorem of Fcontraction mappings in rectangular M-metric space, *Appl. Gen. Topol.*, vol. 24, no. 2, pp. 343–358, Oct. 2023. <https://doi.org/10.4995/agt.2023.18557>
- [8] 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>
- [9] **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>
- [10] **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>
- [11] 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>
- [12] 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>
- [13] Abbas, M., **Anjum, R.**, Riasat, S.: A new type of fixed point theorem via interpolation of operators with application in homotopy theory. *Arab. J. Math.* (2022).

<https://doi.org/10.1007/s40065-022-00402-z>

- [14] Abbas, M., **Anjum, R.**, Riasat, S.: Fixed point results of enriched interpolative Kannan type operators with applications. *Appl. Gen. Topol.*, 23(2), 391–404, 2022. <https://doi.org/10.4995/agt.2022.16701>
- [15] **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>
- [16] 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>
- [17] Abbas, M., **Anjum, R.**, Rakoćević, V.: A generalized Suzuki Berinde contraction that characterizes Banach spaces, *Journal of Applied Analysis*, 2022. <https://doi.org/10.1515/jaa-2022-2007>
- [18] 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>
- [19] **Anjum, R.**, Abbas, M.: Common Fixed point theorem for modified Kannan enriched contraction pair in Banach spaces and its Applications, *J. Filomat*. 35(8) (2021), 2485–2495 <https://doi.org/10.2298/FIL2108485A>
- [20] 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>
- [21] 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

Conference Presentations as National Invited Speaker

1. Title: Application to Activation Functions through Fixed-Circle Problems
Conference: 19th Conference on recent advances in mathematical methods, models, and applications
Date: March 2–3, 2024
Location: Lahore School of Economics, Lahore, Pakistan

2. Title: Fixed point property of a nonempty set relative to the class of friendly mappings
Conference: 7th UMT International Conference on Pure and Applied Mathematics (7th UICPAM-2023)
Date: December 4–5, 2023
Location: University of Management and Technology, C-II, Johar Town, Lahore 54770, Pakistan.

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.
- [8] *Decreasing rearrangement of measurable function*, February 27, 2018, Main Hall, ASSMS, GCU, Lahore.

Workshop/Conference/Symposium/Seminar/Intensive Courses Attended

- [1] *2nd International Conference 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"*, February 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 Algebric 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)