

Dr. Fawad Ali

Assistant Professor of Mathematics, Department of Mathematics,

COMSATS University Islamabad, Islamabad 45550, Pakistan.

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OBJECTIVES

My primary objective as a mathematician is to expand my research and contribute to this competitive world by utilizing my knowledge in graph theory, analysis, mathematical modeling, and combinatorics. I additionally apply mathematical tools to assist system operations and create custom mathematical answers. This objective may be accomplished with superior training, expertise, outstanding mathematical abilities, and teamwork. As a mathematician, I am dedicated to staying aware of the most recent mathematical advancements, undertaking substantial research, and continuously upgrading my skills. This being said I am confident that I will be an asset to the institute.

RESEARCH INTERESTS

Algebraic Graph Theory, Spectral Graph Theory, Chemical Graphs, Group Theory, Ring Theory, Combinatorics, and Discrete Mathematics.

QUALIFICATIONS

PhD, Pure Mathematics (Specialization in Spectral Graph Theory) **2018 – 2021**

Xi'an Jiaotong University, Xi'an, P. R. China.

Thesis Title: On the Spectrum of Graphs Arising from Certain Groups and Related Topics

CGPA: 3.55/4.00

MPhil, Pure Mathematics (Specialization in Group Theory and Graph Theory) **2015 – 2017**

Quaid-i-Azam University Islamabad,

Thesis Title: Automorphisms Groups and Their Fixed Points.

CGPA: 4.1/5.00

PROFESSIONAL EXPERIENCE

[Jan 2023 – Till date] Assistant Professor

Department of Mathematics, COMSATS University, Islamabad, Pakistan.

Responsibilities:

Teaching and Supervision.

Courses Taught:

Undergrads: Real Analysis I & II, Graph Theory, Calculus and Analytic Geometry, Group Theory, Advanced Group Theory,

Graduates: Spectral Theory.

[Mar 2021 – Jan 2023] Lecturer

Institute of Numerical Sciences, Kohat University of Science & Technology, Kohat, KP, Pakistan.

Responsibilities:

Teaching and Supervision.

Courses Taught:

Undergrads: Discrete Mathematics, Combinatorics and Graph Theory, Rings and Fields, Statistics, Calculus, Group Theory, Advanced Group Theory, Topology, ODEs.

Graduates: Spectral Theory.

[Jan 2016 – Aug 2017] Lecturer

Cadet College Murree, Murree:

Teaching and Trainer.

[Sep 2019 – Aug 2021] Research Assistant

School of Mathematics and Statistics, Xi'an Jiaotong University, Xi'an, P. R. China.

Responsibilities:

- Conducting seminars for undergrad students,
- Tutor for theoretical courses,
- Assisting and supervising students in final-year projects.

SUPERVISIONS

HEC Approved PhD Supervisor. App ID: 112518.

<https://www.hec.gov.pk/english/scholarshipsgrants/ASA/Pages/APS-EPORTAL.aspx>

PhD Scholars Currently Enrolled:

1. **Kalim Ullah**. Currently enrolled at the Department of Mathematics, COMSATS University Islamabad, Islamabad 45550, Pakistan.

MPhil Scholars Supervision:

1. **Mujahid Ahmad (FA22-RMT-039)**. Detection and classification of brain disorder in MRI data using neural network. (*Supervisor, Session 2022-2024*) Research synopsis approved.
2. **Asma Faiz (MT320192002)**. Power graphs of gyrogroups determined by their generalized spectra. (*Supervisor, Session 2019-2023*) completed.
3. **Kumail Raza (MT320211007)**. Certain topological properties of commuting graphs over semi-dihedral groups. (*Supervisor, Session 2021-2023*) completed.
4. **Tanzeela Rubab (MT320211009)**. Combinatorial properties of power graphs of gyrogroups. (*Supervisor, Session 2021-2023*) completed.
5. **Rimsha (MT320212014)**. Hosoya properties of the commuting graphs over finite subgroups of $SL(2, \mathbb{C})$. (*Supervisor, Session 2021-2023*) completed.

6. **Husna bibi (MT320212012)**. Distance properties of commuting graphs over finite non-abelian groups (*Supervisor, Session 2021-2023*) completed.
7. **Nouman Ahmad (MT320211005)**. Distance-based topological descriptors of power graphs associated with gyrogroups (*Co-supervisor, Session 2021-2023*) completed.
8. **Hamid Ayub (MT320211003)**. An introduction to non-associative neutrosophic semihypergroups (*Co-supervisor Session 2021-2023*) completed.
9. **Wajid Rasool (MT320202006)**. Interval-valued q-rung orthopair fuzzy Aczel-Alsina operations-based Bonferroni mean aggregation operators and their applications (*Co-supervisor, Session 2020-2023*) completed.
10. **Hayat Ullah (MT320182005)**. A modified bipolar soft sets-based model for solving decision-making problems. (*Co-supervisor, Session 2018-2022*) completed.
11. **Shafi ur Rehman (MT320202001)**. Multi-criteria group decision-making method based on probabilistic hesitant fuzzy partitioned Maclaurin symmetric mean operators. (*Co-supervisor, Session 2020-2022*) completed.

Undergraduate Students Currently Enrolled:

1. Qurat ul Ain Abbasi (FA20-BSM-051)
2. Shiza Aashiq (FA20-BSM-058)
3. Madiha Noor (FA20-BSM-033)
4. Aliya Malik (FA20-BSM-004)

PUBLICATIONS

CIF: 46.056

Citations: 144, h-index: 8

Since 2021-2023

1. **Fawad Ali***, Bilal A. Rather, Muhammad Naeem, and Wei Wang. Degree and distance based topological descriptors of power graphs of finite non-abelian groups. *Discrete Applied Mathematics*. 345, 62–76, 2024. <https://doi.org/10.1016/j.dam.2023.11.038>.
2. Rashad Ismail, **Fawad Ali***, R. Qasim, M. Naeem, W. K. Mashwani, & S. Khan. Several Zagreb indices of power graphs of finite non-abelian groups. *Heliyon*, 9(9): 2023. <https://doi.org/10.1016/j.heliyon.2023.e19560>.
3. **Fawad Ali***, et al. Certain topological indices of non-commuting graphs for finite non-abelian groups. *Molecules*. 27, 6053, 2022. <https://doi.org/10.3390/molecules27186053>.
4. Bilal A. Rather, **Fawad Ali***, et al. Hosoya polynomials of power graphs of certain finite groups. *Molecules*. 27, 6081. 2022. <https://doi.org/10.3390/molecule2718681>.
5. **Fawad Ali** et al. Power graphs of finite groups determined by Hosoya properties. *Entropy*. 24(2): 213, 2022. <https://doi.org/10.3390/e24020213>.
6. **Fawad Ali***, et al. Certain topological indices of commuting graphs for finite non-abelian groups. *Symmetry*. 14, 214, 2022. <https://doi.org/10.3390/sym14061266>.

7. Bilal A. Rather, **Fawad Ali***, et al. A_α -matrix of commuting graphs of non-abelian groups. *AIMS Mathematics*, 7(9), 12730-12746, 2022. Doi:[10.3934/math.2022845](https://doi.org/10.3934/math.2022845).
8. Bilal A. Rather, **Fawad Ali***, Asad Ullah and Nahid Fatima. On A_γ matrix of zero divisor graph of the integer modulo and the von Neumann regular rings. *Symmetry*, 14, 1710, 2022. <https://doi.org/10.3390/sym14081710>.
9. Bilal A. Rather, M. Aijaz, and **Fawad Ali**, Asad Ullah*, and Abdullah Assiry. On distance signless Laplacian eigenvalues of zero divisor graph of commutative rings. *AIMS Mathematics*, 7(7), 12635–12649, 2022. Doi:[10.3934/math.2022699](https://doi.org/10.3934/math.2022699).
10. Ting Cui, Peijiang Liu*, Anwarud Din, and **Fawad Ali**. Theoretical and Numerical Analysis of COVID-19 Pandemic model with non-local and Non-singular kernels. *Scientific Reports*, 12, 18178, 2022. <https://doi.org/10.1038/s41598-022-21372-4>.
11. Muhammad Riaz, Aurang Zeb, **Fawad Ali**, Muhammad Naeem*, Sama Arjika. Fermatean cubic fuzzy aggregation operators and their application in multi-attribute decision-making problems. *Journal of Functions Spaces*, 2022, 2022, 1-18. <https://doi.org/10.1155/2022/3664302>.
12. Alharbi, Khalid Abdulkhaliq M, Asad Ullah*, Nahid Fatima, Rajwali Khan, Muhammad Sohail, Shahid Khan, Waris Khan, and **Fawad Ali**. Impact of viscous dissipation Coriolis effects in heat and mass transfer analysis of the 3D non-Newtonian fluid flow. *Case Studies in Thermal Engineering*. 102289, 2022. <https://doi.org/10.1016/j.csite.2022.102289>.
13. Muhammad Sarfraz, **Fawad Ali**, and Yongjin Li*. Characterization of a group-norm by maximum functional equation and stability results. *ScienceAsia*, 21, 2021. Doi:[10.2306/scienceasia1513-1874.2021.085](https://doi.org/10.2306/scienceasia1513-1874.2021.085).

Since 2019-2020

14. **Fawad Ali**, Saba Fatima, and Wei Wang*. On the power graphs of certain finite groups. *Linear and Multilinear Algebra*, 1–15, 2020. <https://doi.org/10.1080/03081087.2020.1856028>.
15. **Fawad Ali** and Yongjin Li*. The connectivity and the spectral radius of commuting graphs on certain finite groups. *Linear and Multilinear Algebra*. 1–14, 2019. <https://doi.org/10.1080/03081087.2019.1700893>.
16. **Fawad Ali**, Umar Hayat and Yongjin Li*. Fixed points of automorphisms of certain finite groups. *International Journal of Algebra*, 13(4), 167–183, 2019. <https://doi.org/10.12988/ija.2019.9618>.
17. Muhammad Sarfraz, **Fawad Ali**, and Yongjin Li*. Lipschitz isomorphism and fixed point theorem for normed groups. *Cogent Mathematics & Statistics*, 7(1), 1859673, 2020. <https://doi.org/10.1080/25742558.2020.1859673>.

Since 2016-2018

18. Umar Hayat* and **Fawad Ali**. Fixed points of automorphisms of $\mathbb{Z}_p \times \mathbb{Z}_{p^3}$. *Journal of Mathematical Analysis*. 7:91–101, 2016.
19. Abdussakir*, Sudarman, MN Jauhari and **Fawad Ali**. Survey on topological indices and graphs associated with a commutative ring. *Journal of Physics: Conference Series*. 1562, 2020. Doi: [10.1088/1742-6596/1562/1/012008](https://doi.org/10.1088/1742-6596/1562/1/012008).
20. **Fawad Ali**, Umar Hayat* and Álvaro Nola de Celis. Commuting graphs on Coxeter groups, Dynkin diagrams, and finite subgroups of $SL(2, \mathbb{C})$. Preprint, 2017. [ArXiv:1703.02480](https://arxiv.org/abs/1703.02480). (Forthcoming).

1. **Fawad Ali***, et al. A Contemporary Survey of Power Graphs. *Electronic Journal of Graph Theory, Under review*, 2023.
2. **Fawad Ali***, Muhammad Sarfraz, and Bilal A. Rather. A note on certain properties of the commuting graphs associated with finite groups. *Journal of Algebra and its Applications. Under review*, 2023.
3. **Fawad Ali***, Rakhshanda Qasim, Muhammad Naeem, and Yogendra Singh. Computation of certain topological descriptors of power graphs over finite non-abelian groups. *Bulletin of the Iranian Mathematical Society. Under review*, 2023.
4. Asad Khan, **Fawad Ali**, and Anwarud Din*. New stochastic SIQRC epidemic model COVID-19 disease. *Waves Random and Complex Media. Under review*, 2023.
5. Yogendra Singh, Anand K. Tiwari*, and **Fawad Ali**. On the A_α and RD_α matrices over certain groups. *Journal of Algebra and its Applications. Under review*, 2023.
6. Yogendra Singh, Anand K. Tiwari*, and **Fawad Ali**. On the Spectral properties of power graphs over certain groups. *Bulletin of the Malaysian Mathematical Society. Under review*, 2023.
7. Yogendra Singh, Anand K. Tiwari*, and **Fawad Ali**. On the power graph of a gyrogroup. *Turkish Journal of Mathematics. Under review*, 2023.
8. Yogendra Singh, Anand K. Tiwari*, and **Fawad Ali**. Hosoya properties of power graphs over certain groups. *Mathematical Sciences. Under review*, 2023.

PROFILE LINKS

Google Scholar:

https://scholar.google.com/citations?hl=en&view_op=list_works&gmla=AJsNF6P7djcTKNFhmpf9eh19CQqY9fK3dlCzIN_sx5oR_m54s_p951B4zvgrKxIDn4tNfjLbhh951-1iYuvzP1zKDySd2xcEWWDi0lsG6ihal4peKQ8zSk&user=WAY2VPsAAAAJ

ResearchGate: <https://www.researchgate.net/profile/Fawad-Ali-13/research>

ORCID: <https://orcid.org/0000-0002-7788-791X>

AWARDS

- Silver Medalist in Master (2012- 2014), Abdul Wali Khan University Merit-based scholarship inner, Feb 2021.
- Awarded Haier Core-i5 laptop by PM laptop scheme at MPhil level

WORKSHOPS/SYMPOSIUMS

- Chinese government scholarship for PhD winner, from September 2017-September 2021.
- International training workshop on resources and environment data Sharing for the Silk Road Economic Belt (August 2018).
- International seminar on the climate system and climate change (July 2019).

CONFERENCES

- Attended various departmental seminars, including weekly departmental meetings.
- Attend the 13th international mathematics conference at COMSAT, Abbottabad, Pakistan (2013).
- Attend the all-Pakistan mathematical centre for Physics (NCP), Islamabad, Pakistan (2013).
- Conference on natural science, University of Malaya, Malaysia (2018).
- OCMFCA conference, BIRUNI University, Turkey (2020).

- Symmetry in Newcastle seminar (2020).

SKILLS

Work:

Latex, Mathematica, GAP, and MS Word.

Languages:

English, Chinese, Pashto, and Urdu.

REFERENCES

- Prof. Dr. Wei Wang,
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- Prof. Dr. Wali Khan Mashwani,
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