Faculty Name: Dr. Mushtaq Ahmad Bhat
Designation :   Assistant Professor Grade I, L12
Subject :   Mathematics
Area of Specialization : Discrete Mathematics, Spectral Graph Theory.
Institute: National Institute of Technology Srinagar.
Email :   mushtaqab1125@gmail.com, mushtaqab@nitsri.ac.in
Contact No: +919906856689
Category: General

Summary

- Ph.D. Degree in Mathematics in 2015
- Currently working as Assistant Professor Grade I, L12 in the Department of Mathematics at NIT Srinagar.

Awards and Achievements

- Qualified JRF (NET) in 2011.
- Received Post Doctoral Fellowship from IIT Bombay (2015).
- Major Research Project (CRG/2020/000109) sanctioned by DST SERB titled "Spectra and Energy of signed graphs". Total Grant: 20,90,264 (Twenty lakh, ninety thousands two hundred and sixty four). Duration: 3 years. (Jointly with Prof. S. Pirzada).
  Status: Completed.
- Major Research Project MATRICS (MTR/2023/000201) sanctioned by DST SERB titled: "On spectra and energy of eccentricity matrix of graphs and strongly connected digraphs." Total Grant: 6,60,000. Duration: 3 years.
  Status: On going.

Workshops, Seminars, Symposia and Conferences attended

- Participated and presented a poster entitled "spectra and energy of signed digraphs" in Enumerative and Algorithmic combinatorics summer school -2014 held at Research Institute of Symbolic Computations (RISC) Johannes Kepler University Hagenberg Linz, Austria from 18-22 August 2014. (Supported by University of Vienna, Austria).

- Participated and presented a paper on ''spectra and energy of bipartite signed digraphs" at International study center Bader United Kingdom in a conference on "Algebraic combinatorics and group actions" from 11 July -15 July 2016.

- Presented a paper entitled "Graph Energy" in one day conference on "Role of Mathematics in Science , Engineering and Technology", at National Institute of Technology–Srinagar (NIT), March 26, 2012.

- Presented a paper entitled "Energy of Digraphs" in national conference on "Analysis and Applications", at NIT- Srinagar, Nov. 19-20, 2012.

- Presented a paper entitled "On the energy of graphs and signed graphs" in 3rd international conference on Discrete Mathematics (ICDM-2013) held at Karnataka University Pavate Nagar Dharwad from 10-14 June, 2013.

- Participated in 8th JK Science Congress at University of Kashmir, 17-19 September 2012.

- Participated in second International conference on Algorithms and Discrete applied Mathematics 18-20 February, 2016 at University of Kerala.

- Participated in an Annual Foundation School-I (AFS-I) at Chennai Mathematical Institute (CMI), 3rd December to 29th December, 2012.

- Participated in an Annual Foundation School-II (AFS-II) at Indian Institute of Technology (IIT) Kanpur, May, 05-June 01, 2013.

- Participated in an Advanced Instructional School on "Algebraic Combinatorics "at Indian Statistical Institute (ISI) Bangalore, June 24-July 13, 2013.

- Participated in Workshop on "Topics in Algebraic Graph Theory" at CEMS Almora, 13th to 23rd Oct, 2013.

- Participated in an Advanced instructional school on "Combinatorics" at Harish-Chandra Research Institute (HRI) Allahabad-211019, during 28th April-17th May, 2014.

- Participated in an advanced instructional School on "Naive Set Theory " from April 13- May 2, 2015 at university of Kashmir.

- Participated in Research Promotion Workshop on Introduction to graph and geometric algorithms 18-20 May 2015 at University of Kashmir.

- Participated in Indo- Hungarian School on Discrete Mathematics from 15-16 Feberuary 2016 at University of Kerala.

- Participated in One Week Workshop on "Research Methodology in Sciences using Statistical softwares", at Deptt. of statistics , Kashmir University 27 Aug.-1 Sep. , 2012.

- Participated in National workshop on "Ramanujan Graphs" at Pune University March 05-14, 2013.

- Participated in Pre Conference workshop on "Recent Advances in Spectral Graph Theory" at Pavate Institute of Mathematical Sciences (PIMSci) Karnataka University , June 10-14.

- Participated in Regional workshop on research based pedagogical tools held from 3rd July to 5th July, 2017 at University of Kashmir, Srinagar J & K.

- Participated in two day national level workshop on "Geometrical Interpretation of Mathematical Concepts" organized by Department of Mathematics, University of Kashmir from 28-29 August 2018.

- Presented and participated in National conference on " Recent trends in pure and applied mathematics" on 19 December 2017 in the department of department of Mathematics, University of Kashmir.

- Participated in two week faculty development " MATLAB programming techniques" held in the department of electronics, SP College Cluster University from 1st Nov to 11 Nov 2017.

- Participated in Four week orientation course from December 26, 2017 to January 23, 2018 in UGC-HRDC, university of Kashmir and obtained GRADE A.

- Participated in One week online workshop on Recent Trends in Domination in graphs, Algorithms, Complexity and Applications (WRTDG-2020) organized by the Department of Computer Science and Engineering NIT Warangal from 15-19, June 2020.

- Participated in the international conference (Online) on Recent Trends in Graph Theory (ICRTGT-2020) organized by the Department of Mathematics, Karnatak University, Dharwad, India from July 27-29, 2020.

- Participated in Faculty Development Programme on "Mathematics and its Applications" at St. Xaviers College Kolkata from 17-18 February 2023.

- Participated and presented a research paper entitled "Unicyclic and bicyclic signed graphs with minimal and second minimal energy" in 19th Annual ADMA international conference on Discrete Mathematics

and Graph Theory Day organized by Department of Mathematics, Vidyavardhaka College of Engineering, Mysore from 8-10 June, 2023.

- Participated in National Centre for Mathematics (NCM) workshop on Matrix Theory held at Panjab University Chandigarh from December 18-23, 2023.

- Participated and presented a paper titled "On the energy of signed graphs" in an international conference on Applied Analysis and Discrete Mathematics held at Gandhigram Rural Institute, Tamil Nadu, India during January 22-24, 2024.

- Participated and delivered an invited talk on the topic " Spectral properties of signed graphs" in an international conference on Algebra and Discrete Mathematics (ICADM-2024) held at Government College Kattappana, Kerala India during February 20-22, 2024.

- Delivered an invited talk on the topic " An introduction to spectra of graphs" at Bharata Mata College, Thrikkakara, Kochi Kerala on February 23, 2024.

Research Publications

1. S. Pirzada and **Mushtaq A. Bhat**, Energy of signed digraphs, **Discrete Applied Mathematics** 169 (2014) 195-205 (Elsevier) SCI.
2. **Mushtaq A. Bhat** and S. Pirzada, On equienergetic signed graphs, **Discrete Applied Mathematics** 189 (2015) 1-7 (Elsevier) SCI.
3. **Mushtaq A. Bhat** and S. Pirzada, Spectra and energy of bipartite signed digraphs, **Linear and Multilinear Algebra** (2015)1-15. (Taylor and Francis) SCI and Q1
4. **Mushtaq A. Bhat**, Energy of weighted digraphs, **Discrete Applied Mathematics** 223 (2017) 1-14 (Elsevier) SCI.
5. **Mushtaq A. Bhat** and S. Pirzada, Unicyclic signed graphs with minimal energy, **Discrete Applied Mathematics** 226 (2017) 32-39 (Elsevier) SCI.
6. **Mushtaq A. Bhat**, U. Samee and S. Pirzada, Bicyclic signed graphs with minimal and second minimal energy, **Linear Algebra and its Applications**, 551 (2018) 18-35. (Elsevier) SCI and Q1.
7. **Mushtaq A. Bhat** and Juan Rada, Lower bounds for the energy of weighted digraphs, **Linear and Multilinear Algebra** 67 (4) (2019) 743-755. (Taylor and Francis) SCI and Q1
8. **Mushtaq A. Bhat**, T. A. Naiko and S. Pirzada, On co-spectral signed digraphs, **Algebra and Discrete Mathematics**, 27, 2 (2019) 191-201 Scopus.
9. **Mushtaq A. Bhat** and S. Pirzada, On unicyclic graphs with given number of pendent vertices and minimal energy, **Linear Algebra and its Applications** 597 (2020) 86-93. (Elsevier) SCI and Q1.
10. **Mushtaq A. Bhat**, S. Pirzada and Juan Rada, On spectra and real energy of complex weighted digraphs, **Linear and Multilinear Algebra** 68,5 (2020) 1064-1076 (Taylor and Francis) SCI and Q1
11. Tahir Shamsher, **Mushtaq A. Bhat**, S.Pirzada and Y. Shang, Ordering of minimal energies in unicyclic signed graphs, **Revista de la UMA** , 65,1 (2023) 119-133. SCI.
12. S. Pirzada, Tahir Shamsher and **Mushtaq. A. Bhat**, A note on the class of weighted graphs with strong antireciprocal eigenvalue property, **Linear Multilinear Algebra**, 71, 1 (2023) 1-4. SCI and Q1 (Taylor and Francis).
13. Tahir Shamsher, S. Pirzada and **Mushtaq A. Bhat**, On adjacency and Laplacian cospectral switching nonisomorphic signed graphs, **Ars Mathematica Contemporanea**, 23,3 (2023) P3.09. SCI and Q1
14. Tahir Shamsher, S. Pirzada and **Mushtaq A. Bhat**, On the Estrada Index of Signed graphs, **FILOMAT** 38(19) (2024) 6851-6861.SCI.
15. S. Pirzada, Tahir Shamsher and **Mushtaq A. Bhat**, On the eigenvalues of signed complete bipartite graphs, **Ars Mathematica Contemporanea**, 24(2024) P4.08 SCI and Q1

16. **Mushtaq A. Bhat** and P. A. Manan, Bounds for the trace norm of A_α matrix of digraphs, **Discrete Mathematics** 348 (2025) 114491 (Elseiver) SCI and Q1.
17. **Mushtaq A. Bhat** and P. A. Manan, Variation in α trace norm of a digraph by deletion of a vertex or an arc and its applications, **Indian J. Pure and Appl. Math**. (2025) https:/doi.org/10.1007/s13226-025-008047.

Academic Qualifications

Examination Passed	Board/ University	Subjects	Year	Division/ Grade/ Merit
SSC	JKBOSE	General	2002	1st Division
Higher Secondary	JKBOSE	Non-Medical	2004	1st Division
Bachelor's Degree	University of Kashmir	Non-Medical	2008	1st Division
Master's Degree (M.A/M.Sc.)	University of Kashmir	Mathematics	2010	1st Division
NET/SLET	CSIR-UGC	Mathematics	2011	JRF
Ph. D	University of Kashmir	Algebraic Graph Theory	2015	Awarded
Post Doctorate	IIT Bombay			

Teaching Experience/Research Experience

Name of the University/ College/Institution	Duration
1) Govt. Sheikh ul Alam Memorial Degree College Budgam	29 August 2016-15 March 2021. (L10 from 29 August 2016-28 August 2020 and L11 from 29 August 2020-15 March 2021 (F. N.)).
2) NIT Srinagar	Since March 15 (A. N.) till date. (L11 from 15 March (A. N.), 2021-04 August, 2022 and L12 from 05 August 2022 till date)

Departmental Past Assignments:
Feedback Coordinator
Ph. D Coordinator
Examination Coordinator.

Departmental Present Assignments:
NBA and NRIF Coordinator

Ph. D Produced:
01 as 2nd supervisor (Dr. Tahir Shamsher) Jointly with Prof. S. Pirzada
Present Students: 03.
   i)   Mr. Peer Abdul Manan (CSIR JRF)
   ii) Mr. Sohail Bashir (Inspire)
   iii) Basharat Ahmad

Membership:
Life member of ADMA since 2013.

Other Academic related services:

Worked as reviewer in:
   1. Discrete Applied mathematics (Elsevier)
   2. Journal of Mathematical inequalities
   3. Kragujevic Journal of Mathematics
   4. Indian Journal of Pure and Applied Mathematics.
   5. Asian European journal of Mathematics (world scientific)
   6. Journal of Indian Discrete Mathematics Society
   7. Palestine Journal of Mathematics
   8. Mathematical Reviews (American Mathematical Society)
   9. Ars Combinatoria
   10. Journal of Applied Mathematics and Computing.

Worked as Resource person:
1). Delivered a lecture in the pg department of Mathematics Degree college Baramulla on "Cut vertices and cut edges of a graph" on 31-07-2018.
2). Delivered two lectures in the pg department of Mathematics Degree college Baramulla on "Incidence matrices in graphs" on 26-03-2017 and 02-04-2017.
3). Delivered tutorial lectures in Advanced Instructional School (AIS) on Combinatorics and Graph theory from May 1 to May 4, 2023.
4). Evaluated projects and conducted Viva-Voce of B.Sc. students at JK IMSC on 11-03-2023.
5). Evaluated project and conducted Viva-Voce of M. Sc. Students at Department of Mathematics, University of Kashmir on 04-12-2023.

Courses taught at NIT Srinagar. Spring 2021: Mathematics II (Computer Science and Engineering 2nd Semester) Chemical Engineering Mathematics II (CHE 4th Semester)
Autumn 2021: Mathematics I (CSE First Semester)
Spring 2022:Mathematics II (CSE) and Mathematics for Chemical Engineering (CHE 4 th)
Autumn 2022: Applied Mathematics (Mech 4th) and Discrete Math (CSE 3rd)
Spring 2023: Mathematics for Chemical Engineering (CHE 4 th)
Autumn 2023: Discrete Mathematics (CSE 3rd Semester), Mathematics I (Civi and IT first Semester)
Spring 2024: Discrete Mathematics (M.Sc. 2nd Semester Batch 2023) Mathematics II (Civil Engg. 2nd Semester Batch 2023)
Autumn 2024: Discrete Mathematics (CSE,IT 3rd Semester)
Spring 2025: Discrete Mathematics (M. Sc. 2nd Semester), Mathematics-II (IT 2nd Semester).