Prof. Saifur Rahman

Department of Mathematics
Jamia Millia Islamia, New Delhi- 110 025, India
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Research Interests

- Graphs and Hypergraphs; Random Hypergraphs; and their Applications.
- Multi-Criteria Decision Making (MCDM) and Social Affinity.
- Algebraic Structures and Zero Divisor Graphs.
- Fuzzy Sets and Logics with Applications.

Topics Taught

Groups; Rings; Fields and Field Extension; Galois groups; Modules; Linear Algebra; Discrete Mathematics; Topology; Graph Theory; Fuzzy Sets and Logics; Mathematical Programming; Real Analysis; Programming Language C; Mathematical Economics (MBA); Numerical Computation; Practical in Computational Lab with C and MATLAB.

Work Experiences:

- Professor: May 2023 to till date in the Department of Mathematics, Jamia Millia Islamia (A Central University), New Delhi-110025, India.
- Associate Professor: August 2020 to April 2023 in the Department of Mathematics, Rajiv Gandhi University (A Central University), Doimukh-7911112, India.
- Assistant Professor: Stage III (August 2017 to August 2020) in the Department of Mathematics, Rajiv Gandhi University (A Central University), Doimukh-7911112, India.
- Assistant Professor: Stage II (August 2012 to August 2017) in the Department of Mathematics, Rajiv Gandhi University (A Central University), Doimukh-7911112, India.
- Assistant Professor: Stage I (August 2008 to August 2012) in the Department of Mathematics, Rajiv Gandhi University (A Central University), Doimukh-7911112, India.
- Assistant Professor (May 2008 to August 2008) in the Department of Mathematics, Arya Vidyapeeth College (A Govt. Assam College), Guwahati, India.
- Guest Lecturer in the IDOL, Gauhati University, Guwahati, India.
- M. Tech. research Project carried out at National Geophysical Research Institute, Hyderabad, India (2007 to 2008).

Education

- Ph. D. on the topic entitled "Fuzzy Aspects of Some Algebraic Structure" from Department of Mathematics, Gauhati University, Guwahati, India (2012).
- Master of Technology (M. Tech.) in Computational Seismology from Tezpur University (A Central University) with distinction (2008).
- Master of Science (M. Sc.) in Pure Mathematics from Gauhati University, Guwahati, Assam, India (2005, result declared 2006).
- Bachelor of Science (B. Sc.) in Mathematics from B. N. College, Dhubri, Assam, India (2003).
- Higher Secondary (Science) Schooling from Agomoni H. S. School, Dhubri Assam, India (2000).
- Secondary Schooling from Kachakhana H. S. School, Dhubri Assam, India (1998).
- Middle Schooling (Class V-VII) from Jhakuabari M. E. Madrassa, Kachakhana, Dhubri Assam.
- Lower Primary Schooling (Class I-IV) from Balabari L. P. School, Kachakhana, Dhubri Assam.

Selected Awards and Recognition

- Joint CSIR-UGC Junior Research Fellow (JRF+LS) in 2006.
- Graduate Aptitude Test for Engineer (GATE) 2007 conducted by IIT, Kanpur.

Ph. D. Guided (5)

- **Raju Doley, thesis title:** "A study on graphs and hypergraphs: Some Theoretical prospects and Applications" (2024).
- **Nabajyoti Baro (Assistant Professor, M. C. College**), **thesis title:** "Some theoretical prospective of hypergraphs and its applications" **(2024).**
- **Maitrayee Chowdhury (Assistant Professor, Assam Down Town University), thesis title:** "A study of graphs and hypergraphs with special reference to algebraical spaces, number theory, hyperoperational implications and elliptic curve cryptography" **(2022).**
- **Gete Umbrey (Assistant Professor, Jawaharlal Nehru College), thesis title:** "A study of semirings: Some theoretical prospects and approaches towards decision making" **(2021).**

- **Apil Uddin Ahmed (Assistant Professor, Assam Don Bosco University), thesis title:** "Some Aspects and applications of Semirings and Semimodules: A study in fuzzy setting" **(2020)**

Ongoing Ph. D. Students

- **Nanggom Gammi, NET, thesis title:** "A study on graphs and hypergraphs with implication towards different structures and their applications"
- **Monkhum Khilak (Assistant Professor, Jawaharlal Nehru College), thesis title: "Exploring the application of measure of noncompactness for solvability of system of equations in Banach Spaces"**

M. Phil./PG dissertation (completed):

1	***P.G dissertation**	**Tarik Maying**	**June, 2019**
2	***P.G dissertation**	**Pasang Tsering**	**June, 2019**
3	***P.G dissertation**	**Dhrubajit Gogoi**	**June, 2019**
4	***P.G dissertation**	**Puna Tagia**	**October, 2020**
5	***P.G dissertation**	**Reshum Rekhung**	**October, 2020**
6	***P.G dissertation**	**Nada Tado Tarung**	**October, 2020**
7	***P.G dissertation**	**Sorang Yapi**	**October, 2020**
8	***P.G dissertation**	**Susmita Pegu**	**October, 2020**
9	***P.G dissertation**	**Pinmo Angu**	**June, 2022**
10	***P.G dissertation**	**Minkar Loi**	**June, 2021**
11	***P.G dissertation**	**Pane Natung**	**June, 2022**
12	***P.G dissertation**	**Obit Jomyang**	**June, 2022**
13	***P.G dissertation**	**Pankaj Gogoi**	**June, 2022**
14	***P.G dissertation**	**Meri Kamki**	**June, 2022**
15	***P.G dissertation**	**Minam Jamoh**	**June, 2022**
16	***P.G dissertation**	**Najung Taikam**	**June, 2022**

Published Articles

1. **Saifur Rahman** and Nanggom Gammi, On zero-divisor graphs of Semi-Simple Ring, Bull. Cal. Math. Soc. (Accepted).

2. Monkhum Khilak, **Saifur Rahman** and Bipan Hazarika, Existence results of a nonlinear fractional integral equation via measure of noncompactness (accepted), Rocky Mountain Journal of Mathematics.
3. **Saifur Rahman,** Nabajyoti Baro, Pankaj Kakati**,** Choquet integral operator over random hypergraph and its application in multicriteria decision making (Pre-print)**, DOI:10.21203/rs.3.rs-3398945/v1 (under review).**
4. **Saifur Rahman**, Amal S. Alali, Nabajyoti Baro, Shakir Ali, Pankaj Kakati, A Novel TOPSIS Framework for Multi-Criteria Decision Making with Random Hypergraphs: Enhancing

Decision Processes (under consideration), Symmetry, *Symmetry*, *16*(12), 2024 1602; https://doi.org/10.3390/sym16121602**.**

5. Raju Doley, **Saifur Rahman** and Gayatri Das, On knot separability of hypergraphs and its applications towards infectious disease management, AIMS Mathematics, 2023, Volume 8, Issue 4: 9982-10000. doi: 10.3934/math.2023505**.**
6. **Saifur Rahman** and Gete Umbrey, On Some Properties of Commutative and Idempotent Semirings, Accepted, Bulletin of the Calcutta Mathematical Society, Bull. Cal. Math. Soc., 115, (2) 231–244 (2023).
7. **Saifur Rahman**, Maitrayee Chowdhury, Firos A. And Irina Cristea, Knots and Knot-Hyperpaths in Hypergraphs, Mathematics, 10(3) 424, 2022.
8. **Saifur Rahman** and Gete Umbrey, Semirings of Graphs: Homomorphisms and Applications in Network Problems, Proyecciones Journal of Mathematics,Vol. 41, No 6, pp. 1273-1296, 2022.
9. Pankaj Kakati and **Saifur Rahman**, The q -Rung Orthopair Fuzzy Hamacher Generalized Shapley Choquet integral Operator and its Application to Multiattribute Decision Making, EURO Journal on Decision Processes, 10, 2022, 100012.
10. **Saifur Rahman** and Gete Umbrey, On Some Properties of Semirings of Graphs, Southeast Asian Bulletin of Mathematics, 46(4):553-563, 2022.
11. Gete Umbrey, **Saifur Rahman** and Mahadevan Chandraoulswaran, Algebraic graph join operation and its application, South East Asian J. of Mathematics and Mathematical Sciences, 20, Proceedings (2022), 177-188, 2022.
12. **Saifur Rahman** and Maitrayee Chowdhury, A NOTE ON DIGITAL SEQUENCE HYPERGRAPHS AND 2-GRAPH CONGRUENCE ARITHMETIC, South East Asian J. of Mathematics and Mathematical Sciences, 17(2) 319-336, 2021.
13. Pankaj Kakati, Surajit Borkotokey, **Saifur Rahman** and Bijan Davvaz, Interval neutrosophic hesitant fuzzy Einstein Choquet integral operator for multicriteria decision making, Artificial Intelligence Review, 53, 2171-2206, 2020.
14. Gete Umbrey and **Saifur Rahman**, Application Of Graph Semirings In Decision Networks, Mathematical Forum, 28(1) 40-51, 2020.
15. Gete Umbrey and Saifur Rahman, DETERMINING PATHS ENERGY OF A COMPLEX NETWORK, Advances in Mathematics: Scientific Journal, 9(10) 8761– 8770, 2020.
16. Maitrayee Chowdhury and **Saifur Rahman**, ON COLOURABILITY OF HYPERGRAPHS, Advances in Mathematics: Scientific Journal, 9(10), 8047–8068, 2020.
17. K C Chowdhury, Maitrayee Chowdhury and **Saifur Rahman,** HYPERGRAPH NEAR-RING GROUPS WITH A.C.C. ON ANNIHILATORS, Advances in Mathematics: Scientific Journal, 9(9) 7293–7320, 2020.
18. Apil Uddin Ahmend, **Saifur Rahman** and Firos A, On bipolar fuzzy Subsemimodules With Respects To Bipolar Fuzzy Connectives, Journal of Advanced Research in Dynamical and Control Systems, 12 (SI-2), 14-23, 2020.
19. Gete Umbrey and **Saifur Rahman**, An Approach Towards Rank And Nullity Of Algebraic Expressions Of Graphs, Journal of Advanced Research in Dynamical and Control Systems, 12 (SI-2) 35-45, 2020.

20. Pankaj Kakati, Surajit Borkotokey and Saifur **Rahman**, Interval neutrosophic hesitant fuzzy choquet integral in multicriteria decision making, Journal of Intelligent and Fuzzy Systems, 35(3) 1-19, 2019.
21. Apil Uddin Ahmend and **Saifur Rahman**, On Intuitionistic Fuzzy Automata Based on Semirings with respect to tnorm, Journal of Advanced Research in Dynamical and Control Systems, 11(SI-2) 1940- 1952, 2019.
22. **Saifur Rahman**, Apil Uddin Ahmend and Bijan Davvaz, On intuitionistic fuzzy idempotent, prime, strongly irreducible and t-pure ideals of semirings, Journal of Intelligent and Fuzzy Systems, 33(1) 433- 443, 2017.
23. **Saifur Rahman**, On cuts of Atanassov's intuitionistic fuzzy sets with respect to fuzzy connectives, Information Sciences, 340, 262-278, 2016.
24. Saifur Rahman and Helen K. Saikia, Atanassov's intuitionistic fuzzy submodules with respect to a t-norm, Soft Computing ,17 1253–1262, 2013.
25. **Saifur Rahman**, Helen K. Saikia and Bijan Davvaz, On the Definition of Atanassov's Intuitionistic Fuzzy Subrings and Ideals, Bulletin of Malaysian Mathematical Sciences Society ,36 (2) 401–418, 2013.
26. **Saifur Rahman** and Helen K. Saikia, On the Definition of Intuitionistic Fuzzy h-ideals of Hemirings, Kyungpook Mathematical Journal, 53(3), 435-457,2013.
27. **Saifur Rahman** and Helen K. Saikia, SOME ASPECTS OF ATANASSOV'S INTUITIONISTIC FUZZY SUBMODULE, International Journal of Pure and Applied Mathematics, 77(3) 369-383, 2012.
28. **Saifur Rahman** and Helen K. Saikia, Fuzzy Small Submodule and Jacobson L-Radical, International Journal of Mathematics and Mathematical Sciences, DOI: 10.1155/2011/9 80320, 2011, 980320.
29. **Saifur Rahman** and Apil Uddin Ahmed, On Intuitionistic Fuzzy ideals of semirings with respects to fuzzy connectives, CiiT International Journal of Fuzzy Systems, 9(8) 160-166, 2017.
30. **Saifur Rahman**, Fuzzy hollow submodules, Annals of Fuzzy Mathematics and Informatics, 12, 5601- 5608, 2016.
31. **Saifur Rahman** and Helen K. Saikia, (α, β)-fuzzy submodules with respect to a t-norm, The Journal of Fuzzy Mathematics, 21(4), 859-872, 2013.

Communicated Articles

1. **Saifur Rahman** and Raju Doley, Exploring Eulerian Graphs through Number Partitioning and Strength Profiles Analysis

2. Kholood Alnefaie, Nanggom Gammi, **Saifur Rahman** and Shakir Ali, On zero-divisor graphs of Z_n, when n is square free

3. **Saifur Rahman**, Apil Uddin Ahmed and Helen K Saikia, On automata over semimodules

4. Maitrayee Chowdhury and **Saifur Rahman**, Some hyperoperational aspects of hypergraphs and ideal hypergraph ring with finiteness condition

5. Raju Doley and **Saifur Rahman**, On Eulerian Tours in Hypergraphs using Knot

Book Chapters

1. Pankaj Kakati and **Saifur Rahman**, Decision-Making Model for Medical Diagnosis Based on Some New Interval Neutrosophic Hamacher Power Choquet Integral Operators, 45-77, 2022, Big Data Analytics Digital Marketing and Decision-Making *Edited By Kiran Chaudhary, Mansaf Alam, Tailors and Francis, ISBN No.* 9781003307761
2. Apil Uddin Ahmed and **Saifur Rahman,** Some Aspects of intuitionistic Fuzzy ideals of fully idempotent and weakly regular semirings, 26-44, 2017 Recent Trends of Mathematics edited by Saifur Rahman, EBH Publishers, India ISBN No. 9789383252626

Book Authored and Edited

1. **Saifur Rahman** and Helen K. Saikia, Some Aspects of fuzzy Algebraic Structures, 172, 2013**,** Scholars' Press, Germany**, ISBN No.** 9783639702200
2. **Saifur Rahman**, Recent Trends of Mathematics, 217, 2017**,** EBH Publishers, India**, ISBN No:** 9789383252626
3. Contributor for the Asian adaptation of CALCULUS: EARLY TRANSCENTDANTALS, 12th Edition, 2022 by Howard **Anton**, Irl Bivens, et al. published by Wiley India.

Research Project

1. Research Project entitled "Fuzzy Aspects of rings and modules Theory" sponsored by UGC during 2012-2014.

Conference/ Seminar organized

1. **Convener** AICTE sponsored Short Terms Training Program Phase III on "Big Data Analytics using Soft Computing Tools (With Artificial Intelligence and Machine Learning)" during 29th November 2021 to 4th December 2021 (One Week)
2. **Convener** AICTE sponsored Short Terms Training Program Phase II on "Big Data Analytics using Soft Computing Tools (For Data Engineering)" during 8th November 2021 to 13th November 2021 (One Week)
3. **Convener** AICTE sponsored Short Terms Training Program Phase I on "Big Data Analytics using Soft Computing Tools (Data Analytics)" during 27th September 2021 to 2nd October 2021 (One Week)
4. **Convener** of Webinar on "Machine learning and Deep learning using MATLAB" on 19th June 2020
5. **Organizing Secretary:** Mathematical Sciences & Applications in Science, Engineering & Technology (MSASET-19)

6. **Organizing Secretary:** Second National Conference on Recent Trends of Mathematics and its Applications, 2015

7. **Organizing Secretary:** National Conference on Recent Trends of Mathematics and its Applications, 2014
8. **Organizing Secretary:** Workshop on Elementary Mathematics for School Teachers, 2016

9. **Organizing Secretary:** One Day Memorial Lectures On Industrial and Financial Mathematics In Memory of Great Indian Mathematician Srinivasa Ramanujan

Countries Visited:

- Istanbul, Turkey.

National and International Conference/ invited talk/ Workshop/FDP etc.

Title/Academic Session/ Subject	Organizing Institution (with City & Country)	Type of Conference/ Seminar/ Workshop (National/International)	Date of Lecture
A Walk: Through Graph and Hypergraphs: Concepts and Applications (Talk-2)	IIIMT-Algebra Forum & AMU Algebra Research Group	Joint International Seminar: Algebra and its Application organized	December 18, 2024
A Walk: Through Graph and Hypergraphs: Concepts and Applications (Talk-1)	IIIMT-Algebra Forum & AMU Algebra Research Group	Joint International Seminar: Algebra and its Application organized	December 11, 2024
Deterministic Finite Automata over Semimodules	Rajiv Gandhi University (A Central University) Doimukh INDIA	1st International Conference International Conference On Advances in Mathematics, Science and Technology (ICAMST-2020)	1-3 September 2020
Introduction to Groups and tools to learning Abstract Algebra	Arya Vidyapeeth College, Guwahati, India	National Webinar	16.07.2020
Art of Learning Mathematics: An approach to Abstraction	Royal Global University, Guwahati, India	National Webinar	08.06.2020
Cut Sets of Attanassov's Fuzzy sets ….connectives: t-norms and t-conorms	Gauhati University, Guwahati, India	International conference on Frontiers in Mathematics	26-28th March, 2015

Fuzzy Hollow Submodules	Tripura University, Agartala, India	2nd International Conference of Rough Sets, Fuzzy Sets and Soft Computing	17-19th January, 2013
(α, β)- Fuzzy Submodules with Respect to a T-norm	Yildiz Technical University, Istanbul, Turkey	International Conference on Applied Analysis and Algebra	29th June -2nd July 2011
On Cuts of Attanassov's Fuzzy sets ….connectives	Gauhati University, Guwahati, India	National Conference on Advances in Mathematical Sciences	22-23 December 2016
Anisotrophy…Phases	Gauhati University, Guwahati, India	National Conference on recent Trends in Mathematics and its applications	12-13 September 2009

Workshop/ FDP attended:

1. FDP on R programming, *Sri Krishna Arts and Science College, Coimbatore and IIT, Mumbai,* 19-04-2020 to 24-04-2020
2. FDP on basic in R programming, *Rajiv Gandhi University and IIT, Mumbai,* 29-04-2020 to 03-05-2020
3. FDP on Emerging Issues in Social Science Research, *Rajiv Gandhi University,* 04-05-2020 to 08-05-2020
4. FDP on FIVE DAY NATIONAL LEVEL FACULTY DEVELOPMENT PROGRAM ON LaTeX+Xfig, *Rajiv Gandhi University,* 18-09-2020 to 22-09-2020
5. Advanced Training in Mathematics School for Lecturers (ATML), Department of Mathematics, IIT Guwahati, Guwahtai, Assam 2 Weeks (5th to 17th July, 2010)
6. Intensive Course on Elasticity Theory of Dislocation and Inversion of Ground Surface Strain Fields held at Department of Physics, Tezpur University, 2 weeks (18th – 28th December, 2006)
7. Advanced Training Programme in Mathematics for Under-Graduate Students of North-East Region, Mathematical Sciences Division, IASST, Guwahati-22, 3 weeks (23rd June to 8th July, 2003)

Professional Affiliations

Status	Organization
Student Member	EAGE (European Association of Geophysist and Engineers)
Life Member	Assam Academy of Mathematics

Member	Board of Undergraduate Syllabus for Mathematics of Rajiv Gandhi University, till April, 2024
Member	Board of Post Graduate Syllabus for Mathematics of Rajiv Gandhi University, till April, 2024
Coordinator	Departmental Web Coordinator, Rajiv Gandhi University, till April, 2023
Coordinator	ICT Members, till April, 2023
Member	Library Stoke Verification Committee, till April, 2023
Member	Convocation Committee, RGU
Member	Planning Committee, RGU 2021-2022
Coordinator	Departmental SWAYAM coordinator,RGU till April, 2023
Coordinator	Departmental NAAC SSR coordinator, RGU till April, 2023

Computing Skills

- Languages : BASIC, C, C++, FORTRAN
- Software's: R, MATLAB, MATMATICA, Word Processors (MS-office, Latex).
- Platforms : Linux, Windows

Languages Known

English, Hindi, Assamese, and Bengali

Prof. Saifur Rahman