Yousef Zamani, PhD
Professor of Mathematics

Interests:

Multilinear Algebra & Representation Theory of Finite Groups:

- Symmetry Classes of Tensors

- Generalized Symmetry Classes of Tensors

- Decomposable Numerical Range

- Symmetry Classes of Polynomials

- Cartesian Symmetry Classes

- Generalized Cartesian Symmetry Classes

- Probabilistic Finite Group Theory

- Characterization of Finite Groups by Their Solubility Graph

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Professional Experience:

Sahand University of Technology Assistant Professor 1999 2007
Sahand University of Technology Associate Professor 2007 2016
Sahand University of Technology Professor 2016 Now

Education:

B.Sc: Pure Mathematics University of Tabriz 1992 Iran
M.Sc: Pure Mathematics University of Tabriz 1994 Iran
Ph.D: Pure Mathematics University of Tabriz 1998 Iran

Professional Membership:

Iranian Mathematical Society

Teaching Experience:

Calculus (B.Sc)
Differential Equations (B.Sc)
Engineering Mathematics (B.Sc)
Linear Algebra (B.Sc)
Algebra (B.Sc)
Number Theory (B.Sc)
Advanced Algebra (M.Sc)
Representation Theory of Finite Groups (M.Sc)
Multilinear Algebra (M.Sc & Ph.D)
Finite Groups (M.Sc)
Lie Algebra (M.Sc)
Finite Groups II (Ph.D)
Representation Theory of the Symmetric Group (Ph.D)
Selected Topics in Multilinear Algebra (Ph.D)
Character Theory of Finite Groups (Ph.D)

Administrative Experience

Head of Education Department, Sahand University of Technology, Sep. 1999--Sep. 2004

Head of Central Library, Sahand University of Technology, 2004--2008

Deputy of Faculty of engineering basic sciences, Sahand University of Technology, 2013--2014

Head of Faculty of Basic Sciences, Sahand University of Technology, 2018--2020

Awards and Distinctions:

Outstanding M.Sc. graduate of Faculty of Mathematical Sciences, University of Tabriz, Tabriz, Iran, 1994.

Distinguished researcher of faculty, 2001.

Distinguished lecturer of faculty, 2010.
Distinguished lecturer of faculty, 2011.
Distinguished researcher of faculty, (Festival to Honor Outstanding Researchers and Technologists of Tabriz University of Technology 2025).

Conference Organization

Member of the Scientific Committee, 57th Annual Iranian Mathematics Conference, University of Tabriz, Tabriz, Iran, 2026.

Member of the Scientific Committee, 28th Iranian Algebra Seminar, University of Maragheh, Maragheh, Iran, 2024.

Chair of the Scientific Committee Chair, The 12th International Seminar on Linear algebra and its Applications, Sahand University of Technology, Tabriz, Iran, 2023

Member of the Scientific Committee, 9th Seminar on Linear algebra and its Applications, University of Tabriz, Tabriz, Iran, 2017.

Member of the Scientific Committee, 8th Iranian Group Theory Conference, University of Tabriz, Tabriz, Iran, 2016.

Member of the Scientific and Executive Committe, 14th Iranian Conference on Fuzzy Systems, Sahand University of Technology, Tabriz, Iran, 2014.

. عضو کمیته علمی، هفدهمین کنفرانس آموزش ریاضی ایران، اداره کل آموزش و پرورش استان آذربایجانشرقی، تبریز، ۱۳۹۸

عضو کمیته علمی، همایش کشوری دانش موضوعی - تربیتی در آموزش ریاضی، دانشگاه فرهنگیان تبریز، ۱۳۹۶

Publications:

1. Modular symmetry classes of tensors associated with abelian groups, Pure Mathematics and Applications, Vol. 10, No. 1 (1999) 93--108 (with M. A Shahabi).

2.The vanishing of modular symmetry classes of tensors, Pure Mathematics and Applications, Vol. 11, No. 1 (2000) 99--104.

3. Modular symmetry classes of tensors associated with dihedral groups, Pure Mathematics and Applications, Vol. 11, No. 4 (2000) 615--627 (with M. A Shahabi)

4. The dimensions of modular symmetry classes of tensors associated with dicyclic groups, Pure Mathematics and Applications, Vol. 12, No. 4 (2001) 437--450 (with A. A. Mehrvarz)

5. The dimension of orbital subspace, Pure Mathematics and Applications, Vol. 14, No. 4, (2003) 347--354.

6. The theory of jacobi systems and their abelian representations, Turkish Journal of Mathematics, Vol. 28, No. 2 (2004) 119--135 (with M. Shahryari).

7. The dimensions of certain modular symmetry classes of tensors, JP Journal of Algebra, Number Theory & Applications, Vol. 7, No. 2 (2007) April issue 23 -- 232 .

8. On the special basis of a certain full symmetry class of tensors, Pure Mathematics and Applications, Vol. 18, No. 3-4 92007) 357--363.

9. Symmetry classes of tensors associated with Young subgroups, Asian - European Journal of Mathematics, Vol. 4, No. 1 (2011) 179--185 (with M. Shahryari).

10. An extension of the spectral inculsion spec(K(T)) \subset W(K(T)), ROMAI Journal, Vol 7, No. 1 (2011) 183--188.

11. On the dimensions of Cartesian Symmetry classes, Asian - European Journal of Mathematics, Vol. 5, No. 3 (2012) 1250046 (7 pages)(with M. Shahryari).

12. Symmetry classes of polynomials associated with the dicyclic group, Asian - European Journal of Mathematics, Vol. 6, No. 3 (2013) 1350033 (10 pages)(with E. Babaei).

13. The dimensions of cyclic symmetry classes of polynomials, Journal of Algebra and Applications, Vol. 13, No. 2 (2014) 1350085 (10 pages)(with E. Babaei).

14. On the decomposable numerical range of operators, Bulletin of the Iranian Mathematical Society, Vol. 40, No. 2 (2014) 387--398(with S. Ahsani).

15. Symmetry classes of polynomials associated with the dihedral group, Bulletin of the Iranian Mathematical Society, Vol. 40, No. 4 (2014) 863--874 (with E. Babaei).

16. Symmetry classes of polynomials associated with the direct product of permutation groups, International Journal of Group Theory, Vol. 3, No. 4 (2014) 63—69 (with E. Babaei)..

17. On the dual of an algebraic quantum group, ICASTOR Journal of Mathematical Sciences, Vol. 8, No. 1 (2014) 29--38 (with H. Abbasi & G. A. Haghighatdoost).

18. Symmetry classes of polynomials, Communications in Algebra, Vol 40 (2016) 1514--1530 (with E. Babaei & M. Shahryari)

19. Induced operators on the space of homogeneous polynomials, Asian European Journal of Mathematics, Vol. 9, No. 2 (2016) 1650038 (15 pages) (with M. Ranjbari).

20. Induced operators on symmetry classes of polynomials, International Journal of Group Theory, Vol. 6, No. 2 (2017) 21--35 (with M. Ranjbari).

21. Representations of the general linear group over symmetry classes of polynomials, Czechoslovak Mathematical Journal, Vol. 68, No. 143 (2018) 267--276 (with M. Ranjbari).

22. Generalized symmetry classes of tensors, Czechoslovak Mathematical Journal, Vol. 70, No. 145 (2020) 921--33 (with G. Rafatneshan).

23. Induced operators on the generalized symmetry classes of tensors, International Journal of Group Theory, Vol. 10, No. 4 (2021) 197--211 (with G. Rafatneshan).

24. Orthogonal bases in specific generalized symmetry classes of tensors, Journal of Mahani Mathematical Research, Vol. 13, No. 2 (2024) 209—223 (with G. Rafatneshan).

25. The impact of the solubilizer of an element on the structure of a finite group, Published online: 24 September 2023 (with H. Mousavi & M. Poozesh).

26. Cartesian symmetry classes associated with certain subgroups of S_m, to appear in International Journal of Group Theory (with Seyyed Sadegh Gholami).

27. Generalized Cartesian symmetry classes, to appear in Filomat, 38 (25) (2024) (with Seyyed Sadegh Gholami).

28. Some Properties of the solubility graph of a finite group, to appear in Modern Mathematics and Physics: Theory and Applications (with Mina Poozesh).

29. On the orthogonal bases of generalized symmetry classes of tensors, to appear in Modern Mathematics and Physics: Theory and Applications (with Rasoul Khalilzadeh).

30. Orthogonal basis and group module structure of generalized symmetry classes of tensors, Ricerche di Matematica, Published online: o1 October 2025 (with R. Khalilzadeh).

Presentations:

1. Modular symmetry classes of tensors associated with abelian groups, presented in 10th Algebra Seminar of Iranian in Kordestan University, 21 - 22 October 1998.

2. Modular symmetry classes of tensors associated with dihedral groups, presented in 30th Iranian Mathematics Conference in Ardabil University, August 1999.

3. The vanishing of modular symmetry classes of tensors, Proceeding of the 11th Algebra Seminar of Iranian, Isfahan University of Technology, 27-29 October 1999.

4. The p-blocks of dicyclic groups, Proceeding of the 14th Algebra Seminar, Azzahra University, 16-18 July 2002.

5. Abelian representations of jacobi systems, presented in 33th Iranian Mathematics Conference, Ferdowsi University of Mashhad, Aug 30-Sep 02/2002.

6. The P-blocks of dihedral groups, Proceeding of the 15th Algebra Seminar of Iranian, Guilan University, 19-20 July 2003, pp. 137-141.

7. Dimension of orbital subspace, presented in 16th Algebra of Iranian, Institute for Advanced Studies in Basic

Sciences - Zanjan, 17 - 19 November 2004.

8. Dimensions of modular symmetry classes of tensors associated with certain groups, presented in Third Seminar on Linear Algebra and its Applications, Mahani Mathematical Research Center - Kerman, 28 - 29 December 2004.

9. Modular symmetry classes of tensors associated with the symmetric groups, 35th Annual Iranian Mathematics Conference, January 26 - 29, 2005, Ahvaz, Iran.

10. Cyclic modular symmetry classes of tensors, presented in International conference on Mathematics and Mechanics,
National Academy of Sciences of Azerbaijan (Bakoo), 11-13 May 2005.

11. A brief survey on modular symmetry classes of tensors, 12th International Linear Algebra Society Conference, June 26 -29, 2005, University of Regina, Regina, Saskatchewan, Canada.

12. On the orthogonal dimension of critical orbital sets, Proceeding of the 17th Seminar on Algebra, University of Sistan & Baluchestan, 8-9 March 2006.

13. Non-Commutative vector bundle, Extended Abstracts of 37-th Annual Iranian Mathematics Conference, 2-5 September 2006,
University of Azarbaijan Tarbiat Moallem, pp. 389-390.

14. A note on symmetry classes of tensors, presented in 4th Seminar in Linear Algebra and its Applications, Vali-E-Asr University of Rafsanjan, 7-9 March 2007.

15. Hochschild homology groups of the group algebra kG, presented in 18th Seminar on Algebra, Damghan University of Basic Sciences, 4-5 April 2007.

16 . Noncommutative character theory of the symmetric group, Extended Abstracts of 38th Annual Iranian Mathematics Conference, 3-6 September 2007, Uniiversity of zanjan, pp. 79-81.

17. Critical tensors in Grassmann space and completely symmetric space, presented in 19th Seminar on Algebra, Semnan University, 12-13 March 2008.

18. Decomposable numerical range, presented in 17th Seminar of Mathematical Analysis and its Applications, Arak University, 23-24 April 2008.

19. A note on decomposable numerical range of derivation of induced operator, Extended Abstracts of the 39th Annual Iranian Mathematics Conference, 27 August 2008, Shahid Bahonar Uniiversity of Kerman, pp. 773-776.

20. A brief survey on the equality of immanantal decomposable tensors, Extended Abstracts of the 9th Annual Iranian Mathematics Conference, 24-27 August 2008, shahid Bahonar Uniiversity of Kerman, 777-780.

21. Note on the equality of decomposable symmetrized tensors, Tarbiat Moallem Uninversity,
20th Seminar on Algebra, 2-3 Ordibehesht 1388 (Apr. 22-23, 2009) 237-240.

22. Two irreducible subset of Grassmann Algebra, Extended Abstracts of the Fifth Seminar of Geometry and topology, 12-14 May, 2009 - University of Kurdistan Sanandaj Iran, 257-265 (in persian).

23. Symmetry classes of tensors associated with Young subgroups, International Conference of Mathematical Sciences, 04-10 August 2009, Maltepe University, Istanbul, Turkey.

24. Numerical range of an induced operator, Extended Abstracts the 5th Seminar on Linear Algebra and its Applications & Workshop on Linear Preserving Problems, 28 - 30 Oct. 2009, University of Mazandaran, Babolsar - Iran, pp. 278-282.

25. Variation of induced linear operators, Abstracts of 41st Annual Iranian Mathematics Conference, 12-15 September 2010, University of Urmia, pp. 193.

26. Dimension of the space of relative symmetric polynomials associated with cyclic groups, Extended Abstracts the 6th Seminar on Linear Algebra and its Applications, 8 - 9 June 2011, Arak University, Arak, Iran.

27. Orthogonality of decomposable symmetrized tensors, The Fourth Conference on Algebraic Combinatorics**,** 2 - 3 November 2011, Bu-Ali Sina University, Hamedan, Iran.

28. Dimensions of symmetry classes of polynomials associated with dicyclic groups, 22th Iranian Algebra Seminar, 31 Jan - 2 Feb 2012, Sabzvar Tarbiat Moallem University, Sabzevar, Iran.

29. On the orthogonal basis of symmetry classes of polynomials, Fourth Group Theory Conference of Iran , 7-9 March 2012, Payam Noor University of Isfahan, Isfahan, Iran.

30. Full symmetry classes of polynomials, 43th Annual Iranian Mathematics Conference, 27-30 August 2012, University of Tabriz, Tabriz, Iran.

31. Symmetry classes of polynomials with respect to product of groups, The 6th International Group Theory Conference, 12-13 March 2014, Golestan University, Gorgan, Iran.

32. Matrices that preserve the value of the generalized matrix function of the upper triangular matrices, The 7 Seminar on Linear Algebra and its Applications, 26-27 Feb 2014, Ferdowsi University of Mashhad, Mashhad, Iran.

33. Decomposable \lambda-critical tensors, The 7 Seminar on Linear Algebra and its Applications, 26-27 Feb 2014, Ferdowsi University of Mashhad, Mashhad, Iran.

34. Induced operators on the space of homogeneous polynomials, The 8th Seminar on Linear algebra and its Applications, 13-14 May 2015, University of Kurdistan, Sanandaj, Iran (In Persian).

35. Properties of the induced operators on the space of homogeneous of polynomials, Antalya Algebra Days XVII, 20-24 May 2015, Nesin Mathematics Koyu, Sirince, Izmir, Turkey.

36. Induced operators on symmetry classes of polynomials, The 8th Iranian Group Theory Conference, 3-5 Feb 2016, University of Tabriz, Tabriz, Iran.

37. On the dimensions of generalized orbital subspaces, The 11th Iranian Group Theory Conference, 30-31 Jan 2019, Yazd University, Yazd, Iran.

38. Generalized symmetry classes of tensors, 13th Iranian International Group Theory Conference, 27-28 Jan 2021, Urmia University, Urmia, Iran **(Invited speaker).**

39. Cartesian symmetry classes, 14th Iranian International Group Theory Conference, 3-4 Feb 2022, Iran University of Science and Technology Iran.

40. Cartesian symmetry classes associated with dihedral group, The 12th International Seminar on Linear Algebra and its Applications, 18-19 July 2023, Sahand University of Technology.

41. Generalized Cartesian symmetry classes, The 12th International Seminar on Linear Algebra and its Applications, 18-19 July 2023, Sahand University of Technology.

42. A journey through the history of group theory, The Commemoration Ceremony of the Mathematics Decade, 28 Oct 2025, Sahand University of Technology.

Technical Reports:

1. Modular Symmetry Classes of Tensors Associated with Dicyclic Groups University of Tabriz 1998-1999 finished
2. Abelian Representations of Jacobi Systems Sahand University of Technology 2001-2002 finished
3. Modular Symmetry Class of Tensors Associated with the Principal p-Block Sahand University of Technology 2002-

2004 finished
4. Decomposable Numerical Range Sahand University of Technology 2009-2010 finished.

Thesis of Graduate Students :

(Ph.D Supervision)

1. Esmaeil Babaei, (Supervisor) Symmetry classes of polynomials, Jun 2014.

2. Mahin Ranjbari, (Supervisor) Induced operators on symmetry classes of polynomials, Nov. 2016.

3. Gholamreza Rafatneshan, (Supervisor) Generalized symmetry classes of tensors, Dec. 2020.

4. **Mina Pouzesh,** (Supervisor) A characterization of finite groups by some numerical parameters associated with their solublity graphs, July 2024.

5. **Seyyed Sadegh Gholami**, (Supervisor) Generalized Cartesian Symmetry Classes, Sep. 2024.

6. **Rasoul Khalilzadeh**, (Supervisor) Group module structure and orthogonal basis of generalized symmetry classes of tensors, Oct. 2025.

(M.Sc Supervision)

1. S. Ahsani, Numerical range of the derivation of an induced operator, October 2008.
2. F. Samneia, Equality of symmetrized decomposable tensors, October 2008.
3. N. Sedaye, Decomposable critical tensors, September 2008.
4. R. Hobbi, On the orthogonal dimension of orbital sets, September 2008.
5. R. Khalilzadeh, Variation of induced linear operators, 2010.
6. M. Dehghani, Cartesian symmetry classes and generalized trace functions, September 2010.
7. F. Mahmoudi, Orthogonality of cosets relative to iireducible characters of finite groups, November 2010.
8. M. Hassanzadeh, Decomposable numerical ranges on orthonormal tensors, October 2010.
9. A, Shargi, Subgroup commutativity degree of finite groups, November 2010.
10. S. Azimi, Nonconvexity of the generalized numerical range associated with the principal character, January 2011.
11. M. Ranjbari, Relative symmetric polynomials, July 2011.
12. Z. Asghari, Finite groups with consecutive nonlinear character degrees, August 2011.
13. Z, Kazemi, On the relative commutativity degree of a subgroup of a finite group, August 2012.
14. H. Mohammadi Adimi, On generalized relative commutativity of a finite group, August 2012.
15. A. Zarepour, On the exterior degree of finite groups, August 2012.
16. R. Ghorbani, Decomposable \lambda-critical tensors, September 2012.
17. S. Gabel, Matrices that preserve the value of the generalized matrix function of the upper triangular matrices, September 012.
18. S. Nazari, On generalized commutativity degree of a finite group, July 2013.
19. B. Mir Aali, On the orthogonal bases of symmetry classes of tensors, August 2013.
20. S. Saame, Subgroup normality degree of finite groups, August 2013.
21. S. Keshavarzi, Orthogonality of cosets, September 2013.
22. E. Zarei Holan, Restrictions on commutativity ratios in finite groups, September 2015.
23. M. M. Bairami, Finite groups with three relative commutativity degree, September 2015.
24. N. Nourani, Equality of generalized matrix functions and determinants, October 2015.
25. E. Safari, The intersection graph of a group, Oct. 2016.