

Curriculum Vitae

1. Full Name: Prof. (Dr.) ANIL SHANTARAM KHAIRNAR

2. Date of Birth: 01-06-1980 (First June Nineteen Hundred Eighty)

3. Designation: Professor, Department of Mathematics, Vice-Principal, MES Abasaheb Garware College (Autonomous), Pune.

4. Address for correspondence:

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5. Educational Qualification: M.Sc., M.Phil., Ph.D.

(a) **B.Sc.(Mathematics):** In 2001, **First class with Distinction** from Sangamner College, Sangamner affiliated to Pune University.

(b) **M.Sc.(Mathematics):** In 2003, **First class with Distinction** from Department of Mathematics, Pune University.

(c) **M.Phil.(Algebra):** In 2012, with 'A' grade from Department of Mathematics, Pune University.

Title of the thesis: **Baer, P.P. Rings and Modules**

(d) **Ph.D.(Algebra):** In 2017, from Department of Mathematics, Savitribai Phule Pune University.

Title of the thesis: **Generalisations of Baer Rings and Group Rings with Involution**

6. Qualified Examinations:

(a) **NET** (National Eligibility Test, CSIR).

(b) **GATE** (Graduate Aptitude Test for Engineers).

(c) **DRDO** (Defence Research and Development Organization) SET.

7. Awards/Prizes/Scholarships/Selections:

1. Received the **Best Teacher Award** for the year 2025-26 from the Savitribai Phule Pune University, Pune. The first Mathematics teacher to receive this award from SPPU.
2. Received a **travel support from the American Mathematical Society, the Simmons Foundation** to attend the International Congress of Mathematicians (ICM) 2026 to be held July 23-30, 2026, in Philadelphia, Pennsylvania, USA.
3. **UGC Award of Teachers Fellowship** under the faculty development programme during *XIIth* plan period (2015-1017).
4. Award of “**Junior Research Fellowship**” in the subject Mathematical science under the CSIR (Council of Scientific And Industrial Research) fellowship Scheme.
5. Awarded the “**Chancellors Gold Medal**” from University of Pune for securing highest number of marks in M.Sc. (Mathematics) examination held in April/May 2003.
6. **Young Scientist Award** of the year 2012 from the University of Pune.
7. **AMU prize** of the year 2011 for presenting best research paper in the area of **ALGEBRA** at the 77th Annual Conference of the Indian Mathematical Society.
8. **Best research paper presentation** in the national conference organized by Indira college of Commerce and Science, Pune.
9. Reviewer for **American Mathematical Society**.
10. Elected as a **Member of the Sectional Committee** of the section of Mathematical Sciences (including Statistics) in Indian Science Congress Association (ISCA) for 2017-18.
11. Elected as a member of **Board of Studies in Mathematics**, SPPU.
12. Elected as a member of **College Development Committee**, MES Abasaheb Garware College (Autonomous), Pune.
13. Selected for **Monthly Scholarship** given by Mathematics institute Baskaracharya Pratisthan, Pune (During M.Sc. 2002-2003).

14. Selected for **MTTS** (Mathematical Training And Talent Search Programme) held at IIT Mumbai during May 20 to June 15, 2002, sponsored by NBHM (National Board for Higher Mathematics).

8. Teaching Experience: 22 years (under graduate and post graduate).

Taught more than 20 different courses for under graduate and post graduate students in Mathematics, Computer Science and Biotechnology.

9. Member:

Life Member of the Indian Mathematical Society [**IMS**].

Life Member of the Indian Science Congress Association [**ISCA**].

Member Board of Studies in Mathematics, Savitribai Phule Pune University [**SPPU**].

Member Board of Studies in Mathematics, TC College, Baramati.

Member Board of Studies in Mathematics, St. Mira's College for Girls, Pune.

Member Board of Studies in Mathematics, Rajarshi Shahu Mahavidyalaya (Empowered Autonomous), Latur.

10. Research Guide: Recognized Ph.D. research guide of SPPU, Pune.

No. of students awarded Ph.D.: 04

1. Mr. Vikas Kulal: Topic: Zero Divisor Graphs of Lattices (Date of registration: 12/04/2022, Date of award of Ph.D.: 24/11/2025).
2. Mrs. Anita Lande: Topic: Zero Divisor Graphs of Rings with Involution (Date of registration: 12/04/2022, Date of award of Ph.D.: 10/12/2025).
3. Mr. Sanjay More: Topic: On some open problems in Baer $*$ -ring and related aspects (Date of registration: 26/03/2021, Date of award of Ph.D.: 25/04/2026).
4. Mr. Nana Kumbhar: Topic: Strong Zero-Divisor Graph of Rings with Involution and Related Aspects (Date of registration: 14/03/2018, Date of award of Ph.D.: 06/05/2026).

No. of students currently working: 03

5. Ms. Geetali Bhavar: Topic: Generalizations of Baer Rings (Date of registration: 12/04/2022).

6. Ms. Shubhangi S. Khot: Topic: Partial Orders on Rings with Involution and Related Aspects (Date of registration: 24/04/2025).
7. Mr. Somnath Maruti Sarate: Topic: The Fractional Fourier Transform for Fractional Diffusion Boundary Value Problems (Date of registration: 24/04/2025).

11. Research:

• International collaborations:

Prof. Ivan Gutman, a prominent Mathematician/chemist, Emeritus Professor, University of Kragujevac (Serbia). Prof. Gutman is widely recognised as one of the founding figures of Chemical Graph Theory - the mathematical discipline combining ideas from graph theory, discrete mathematics, and theoretical chemistry. One of his most influential contributions was introducing the concept of “graph energy”. His research spans combinatorics, spectral graph theory, discrete mathematics, molecular graphs, topological indices (e.g. Wiener index), and mathematical chemistry - bridging chemistry and mathematics in novel ways.

• National collaborations:

Prof. T. Tamizh Chelvam is a CSIR Emeritus Scientist at Manonmaniam Sundaranar University, Tamil Nadu, India. His research areas lie in Algebra, Commutative Ring Theory, and Algebraic Graph Theory - especially graphs derived from algebraic structures (e.g. Cayley graphs of groups, zero-divisor graphs, total graphs, additive graphs from commutative rings).

• Research Papers:

1. Anil Khairnar, Anita Lande, Geetali Bhavar and Nanasheeb Phatangare, *Wiener and Harary indices of the generalized zero-divisor graph*, TWMS J. App. Eng. Maths. (Accepted).
2. Krishnat Masalkar, Anil Khairnar, Anita Lande and Lata Kadam, *On Spectrum of the Zero-divisor Graph of Matrix Ring*, Southeast Asian Bull. Math. (Accepted).
3. Anita Lande and Anil Khairnar, *Generalized zero-divisor graphs of rings with involution*, Asian European J. Math. (2026) # 2650030 (Online ready).
4. Anil Khairnar and Anita Lande, *On the spectrum of generalized zero-divisor graph of the ring $\mathbb{Z}_{p^{k_1}q^{k_2}r^{k_3}}$* , Malaysian Journal of Mathematical Sciences, 20(1) (2026), 229-251.

5. Anita Lande and Anil Khairnar, *On the generalized zero-divisor graph of Rickart *-rings and generalized Rickart *-rings*, Journal of the Indian Math. Soc., 93(1) (2026), 97-117.
6. Anil Khairnar and Anita Lande, *Generalized strong zero-divisor graph of rings with involution*, Gulf J. Mathematics, 21(2) (2025), 222-240.
7. Nana Kumbhar, Anil Khairnar and B. N. Waphare, *Strong Zero-divisor Graph of p.q.-Baer *-Rings*, Communications in Mathematics and Applications, 16(3) (2025), 961-974.
8. Krishnat Masalkar, Anita Lande and Anil Khairnar, *Spectrum of the Generalized Zero-Divisor Graphs*, South East Asian J. of Mathematics and Mathematical Sciences 21(2) (2025), 25-42.
9. Dinesh Kute, Arundhati Warke, and Anil Khairnar, *Advancing Fuzzy Algebra: Polynomial Subrings, Zero Divisors, and Related Properties*, Communications in Mathematics and Applications 16(1) (2025), 77-89.
10. Anita Lande, Anil Khairnar and Ivan Gutman, *The Zero-divisor graph of 2×2 matrix ring and its energies*, Filomat 39(22) (2025), 7559–7570.
11. Anil Khairnar and Vikas Kulal, *Atom divisor graph of a poset*, Discrete Applied Mathematics 375 (2025), 167-177.
12. Vikas Kulal, Anil Khairnar and T. Tamizh Chelvam, *Annihilator Intersection Graph of a Lattice*, Discrete Math. Algorithms Appl. 17(3) (2025), 2450034.
13. Anita Lande and Anil Khairnar, *Idempotent graph of 2×2 matrix ring with involution*, Gulf Journal of Mathematics 19(2) (2025), 168-180.
14. Vikas Kulal and Anil Khairnar, *Some results on the strongly annihilator ideal graph of a lattice*, Communications in Combinatorics and Optimization (2025), available online.
15. Sanjay More, Anil Khairnar, and B. N. Waphare, *Unitification of weakly Rickart and weakly p.q.-BAER *-Rings*, Int. Electron. J. Algebra 37 (2025), 179-189.
16. Dinesh Kute, Arundhati Warke, Anil Khairnar and Leena Sharma, *Fuzzy Baer Sub-rings: A Fuzzified Extension of Baer Rings*, Advances in Nonlinear Variational Inequalities 28(2) (2025), 399-409.

17. Dinesh Kute, Arundhati Warke, Anil Khairnar and Leena Sharma, *A Review of Fuzzy Subring Algebra: Theories and Case Studies*, Nanotechnology Perceptions 20, S14(2024) (20 pages).
18. Anita Lande and Anil Khairnar, *On the spectrum of generalized zero-divisor graph of the ring $\mathbb{Z}_{p^\alpha q^\beta}$* , Communications in Mathematics and Applications 15(3) (2024), 1031-1044.
19. Vikas Kulal and Anil Khairnar, *Strongly annihilator ideal graph of a lattice*, Asian-European Journal of Mathematics 17(07) (2024), 2450050.
20. Nana Kumbhar, Anil Khairnar and B. N. Waphare *Strong Zero-Divisor Graph of Rings with Involution*, Asian-European Journal of Mathematics 16(10) (2023), 14 pages.
21. Vikas Kulal, Anil Khairnar, Krishnat Masalkar and Lata Kadam *Weakly Zero Divisor Graph of a Lattice*, Communications in Mathematics and Applications 4(3) (2023), 1167-1180.
22. Vikas Kulal, Anil Khairnar and Krishnat Masalkar, *Annihilator Ideal Graph of a Lattices*, Palestine Journal of Mathematics 11(4)(2022), 195-204.
23. Avinash Patil, Anil Khairnar and P. S. Momale, *Zero-divisor graph of a ring with respect to an automorphism*, Soft Computing 26 (2022), 2107-2119.
24. Avinash Patil, Anil Khairnar and B. N. Waphare, *Zero-divisor graph of a poset with respect to an automorphism*, Discret. Appl. Math 283 (2020), 604-612.
25. Anil Khairnar and B. N. Waphare, *A Sheaf Representation of Principally Quasi-Baer *-Rings*, Algebr. Represent. Theory 22 (2019), 79-97.
26. Anil Khairnar and B. N. Waphare, *Generalized projections in \mathbb{Z}_n* , AKCE Int. J. Graphs Comb. 16 (2019), 1-7.
27. Anil Khairnar and B. N. Waphare: *Conrad's Partial Order on p.q.-Baer *-Rings*, Discuss. Math. Gen. Algebra Appl. 38 (2018), 207-219.
28. Anil Khairnar and B. N. Waphare: *Unitification of weakly p.q.-Baer *-rings*, South-east Asian Bull. Math. 42 (2018), 387-400.

29. Anil Khairnar and B. N. Waphare: *Order properties of generalized projections*, Linear Multilinear Algebra 65(7) (2017), 1446-1461.
30. Anil Khairnar and B. N. Waphare: *Baer Group Rings with Involution*, Int. Electron. J. Algebra, 22 (2017), 1-10.
31. Anil Khairnar and B. N. Waphare: *Zero-Divisor Graphs of Laurent Polynomials and Laurent Power Series*, Springer Proceedings in Mathematics and Statistics, 174 (2016), 345-349.
32. B. N. Waphare and Anil Khairnar, *Semi-Baer modules*, J. Algebra Appl., 14(10) (2015) 1550145 (12 pages).

12. Google Scholar: https://scholar.google.com/citations?user=_BjGooOAAAAJ&hl=en.

ResearchGate: <https://www.researchgate.net/profile/Anil-Khairnar>.

13. Books Published:

- (i) Co-author of more than 21 text books for undergraduate students.
- (ii) Convenor and Co-author of a book Discrete Mathematics for S.Y.B.Sc published by the Savitribai Phule Pune University.
- (iii) Book on Operation research, Anil S. Khairnar and Anagha R. Medhekar, Nirali Publication, ISBN: 9789354517068.
- (iv) Reference Book: Extensions of Baer, P. P. Rings and Modules by Lambert.

14. Research Projects:

Completed one Research Projects of worth Rs. 2 Lacs (Funded by the BCUD University of Pune).

15. Paper presentations:

Presented research papers in 6 International and 10 National conferences.

16. International Academic Visit:

- (1) Humboldt University of Berlin (Germany).
- (2) Paris University of Paris (France).

(3) International Congress of Mathematicians, Rio de Janeiro (Brazil).

17. Countries Visited:

Germany, France, Switzerland, Brazil, United Arab Emirates.