Dr. A. D. Godase

Associate Professor & Head, Department of Mathematics,
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ResearchGate • Instagram
Google Scholar Scopus ORCID ResearcherID Semantic Scholar Springer

Overview

Currently associated with the Department of Mathematics, Vinayakrao Patil Mahavidyalaya, Vaijapur, Chhatrapati Sambhajinagar, Maharashtra, India. Research primarily explores advanced topics in number theory, with a focus on generalized Fibonacci structures and their algebraic applications:

- **Generalized Fibonacci Sequences:** Investigated the properties and extensions of classical Fibonacci sequences into generalized forms, including recurrence relations and combinatorial identities.
- **k-Fibonacci and k-Lucas Numbers:** Studied the properties of k-Fibonacci and k-Lucas numbers, emphasizing identities, binomial summations, and matrix-based formulations that reveal deeper structural relationships.
- **Multiplicative Coupled Fibonacci Sequences:** Developed and analyzed generalized multiplicative coupled Fibonacci sequences of various orders, exploring their recursive behavior and algebraic characteristics.
- **Fibonacci and Lucas Quaternions and Octonions:** Extended Fibonacci and Lucas sequences to higher-dimensional number systems such as quaternions and octonions, including their hyperbolic analogs, and derived novel identities within these frameworks.
- **Applications of Fibonacci Sequences:** Applied Fibonacci-based constructs to define and explore algebraic structures, demonstrating their utility in abstract algebra and mathematical modelling.

Education

- **Doctor of philosophy (PhD)** [October 06, 2021]
  Dr. B. A. M. University Aurangabad. ***Title:*** ***Study of Generalized Fibonacci Sequences***
- **Maharashtra State Eligibility Test (MH-SET)** [September 2009]
- **Master of Science** [June 2003–June 2005]
  Department of Mathematics, Pune University, Pune. ***CGPA:*** *6.45/10*
- **Bachelor of Science** [Jul 2000–Jun 2003]
  Department of Mathematics, Sangamner College, Sangamner affiliated to Pune University, Pune
  Aggregate: *71.83%*
- **Higher Secondary Certificate (10+2)** [May 2000]
  Dnyanmata College, Sangamner (Pune Board). ***Aggregate:*** *61.17%*
- **Secondary School Certificate (10)** [May 1998]
  Chandaneshwar Vidyalaya Chandanapuri, Sangamner (Pune Board). ***Aggregate:*** *78.00%*

Work Experience

- **Associate Professor** at *V. P. College Vaijapur, Aurangabad* [July 2024–till date]
  B.Sc. Mathematics
- **Assistant Professor** at *V. P. College Vaijapur, Aurangabad* [July 2011–July 2024]
  B.Sc. Mathematics
- **Assistant Professor** at *Shri. Muktanand College Gangapur, Aurangabad* [July 2010–July 2011]
  B.Sc. Mathematics
- **Lecturer** at *S.M.B.S.T. College Sangamner, Ahmednagar* [June 2006–April 2010]
  B.Sc., M.C.A. (Science), B.Sc. (Com. Sci.)
- **Lecturer** at *Sangamner College Sangamner, Ahmednagar* [Jul 2005–April 2006]
  B.Sc. Mathematics

Orientation/Refresher Courses/Short Term Courses Participated

- 103^{rd} Orientation Program at A. S. C. Dr. B. A. M. University, Aurangabad, 02/06/2014 to 28/06/2014.
- Refresher Course at H. R. D. C. Dr. B. A. M. University, Aurangabad, 26/05/2015 to 15/06/2015.
- Ph.D. course work in Mathematics at Department of Mathematics, Dr. B. A. M. University Aurangabad, June 18, 2016 to December 17, 2016 (06 months).
- Annual Refresher Programme in Teaching (ARPIT) "History of Indian Science and Technology" at UGC-HRDC, Jawaharlal Nehru University New Delhi, Duration: 16 weeks Start Date: 01 Sep 2019 End Date: 15 Jan 2020.
- Annual Refresher Programme in Teaching (ARPIT) "Skills for New Educational Architecture" at UGC-HRDC, Sant Gadge Baba Amravati University, Duration: 16 weeks Start Date: 01 Sep 2019 End Date: 15 Jan 2020.
- Faculty Development Programme on "Role of Environment, Climate Change and Biodiversity on India's Economy" at UGC-HRDC, Devi Ahilya University, Indore , July 26, 2021 to July 31, 2021.
- Faculty Development Programme on "Gender and Development in the Era of 2020-21" at UGC-HRDC, Devi Ahilya University, Indore , Oct 25, 2021 to October 30, 2021.
- Faculty Development Program on "Applications of Mathematical Tools in Research" at UGC-HRDC, Devi Ahilya University, Indore , June 13-18, 2022.
- Faculty Development Program on "Recent Trends in Mathematical and Statistical Techniques and their Application in Research Methodology" at UGC-HRDC, Devi Ahilya University, Indore , July 11-16, 2022.

Orientation/Refresher Courses/Short Term Courses Organised

- One week faculty Development Program on *"Applications of Mathematical Tools in Research"* in collaboration with UGC-HRDC, Devi Ahilya University, Indore, June 13-18, 2022. **View Report**
- One week faculty Development Program on *"Recent Trends in Mathematical and Statistical Techniques and their Application in Research Methodology"* in collaboration with UGC-HRDC, Devi Ahilya University, Indore, July 11-16, 2022. **View Report**
- One week faculty Development Program on *"LaTeX"*, July 15-21, 2021. **View Report**
- One-Day Faculty Orientation Program on "Dimensions of Curriculum, Teaching-Learning and Evaluation in Mathematics"-July 24, 2016. **View Report**
- One-Day Faculty Orientation Program on "Dimensions of Curriculum, Teaching-Learning and Evaluation in Mathematics"-August 09, 2015. **View Report**
- Two days, National Conference on "Advances in Computational Mathematics"-September 27-28, 2013. **View Report**
- One day orientation program in Mathematics Teaching-September 04, 2011. **View Report**
- One-day Workshop on "Recent Trends in Mathematics"-October 22, 2010. **View Report**

Certificate/Value added courses organized

1. Certificate course on"LaTeX" (06 Months) [2022-23]
2. Value added course on Mathematics for Competitive Examinations-I (06 Months) [2023-24]
3. Value added course on Document Preparation Using LaTeX-I (06 Months) [2023-24]
4. Value added course on Mathematics for Competitive Examinations-II (06 Months) [2024-25]
5. Value added course on Document Preparation Using LaTeX-II (06 Months) [20234-25]

Academic Projects

- **Groups as Graphs** (Advisor: *A. D. Godase*) [Completed]
  Description: Minor Project [***File No.*** *47–495/12(WRO)*] from 01/04/2013 to 01/04/2015 funded by U. G. C. with grant mobilised Rs. 160000.

Publications

Journals

1. A. D. Godase, Recurrent formulas of the generalized Fibonacci sequences of fifth order, *International Journal of Mathematical Archive*, 2013, 4(6), 61–67. **View Paper**
2. A. D. Godase, Fundamental properties of multiplicative coupled Fibonacci sequences of fourth order under two specific schemes, *International Journal of Mathematical Archive*, 2013, 4(6), 74–81. **View Paper**
3. A. D. Godase, On the properties of k-Fibonacci and k-Lucas numbers, *International Journal of Advances in Applied Mathematics and Mechanics*, 2014, 02(01), 100–106. **View Paper**
4. A. D. Godase, On the properties of generalized Fibonacci like polynomials, *International Journal of Advances in Applied Mathematics and Mechanics*, 2015, 02(03), 234–251. **View Paper**
5. A. D. Godase, On The Properties of Generalized Multiplicative Coupled Fibonacci Sequence of r^{th}- order, *International Journal of Advances in Applied Mathematics and Mechanics*, 2015, 02(03), 252–257. **View Paper**
6. A. D. Godase, Unit Graph of some finite Group Z_n, C_n and D_n, *International Journal of Universal Science and technology*, 2015, 01(02), 122–130. **View Paper**
7. A. D. Godase, k-Fibonacci and k-Lucas Sequences and their associated matrices, *Journal of Tripura Mathematical Society*, 2015, 16, 43–56. **View Paper**
8. A. D. Godase, Summation identities for k-Fibonacci and k-Lucas numbers using matrix methods, *International Journal of Mathematics and Scientific Computing*, 2016, 05(02), 74–80. **View Paper**
9. A. D. Godase, Determinantal Identities for k- Lucas Sequence, *Journal of New Theory*, 2016, 12, 01–07. **View Paper**
10. A. D. Godase, Fibonacci and k-Lucas Sequences as Series of Fractions *Mathematical Journal of Interdisciplinary Sciences*, 2016, 04(2), 107–-119. **View Paper**
11. A. D. Godase, Properties of k-Fibonacci sequence using matrix methods, *MAYFEB Journal of Mathematics*, 2017, 17, 11–20. **View Paper**
12. A. D. Godase, Identities of multiplicative coupled Fibonacci sequences of r^{th} order, *Journal of New Theory*, 2017, 15, 48–60. **View Paper**
13. A. D. Godase, Recurrent Formulas of the Generalized Fibonacci Sequences of Third & Fourth order, *Indian Journal in Number Theory*, 2017, 17, 103–110. **View Paper**
14. A. D. Godase, Vector approach to a new generalization of Fibonacci polynomial, *Journal of New Theory*, 2017, 17, 45–56. **View Paper**
15. A. D. Godase, Identities Involving k-Fibonacci and k-Lucas Sequences, *Mathematics Today*, 2018, 34(01), 125–143. **View Paper**
16. A. D. Godase, A matrix representation of a generalized Fibonacci polynomial , *Journal of New Theory*, 2018, 19, 01–19. **View Paper**
17. A. D. Godase, Some Telescoping Series for k-Fibonacci and k-Lucas Sequences, *Mathematics Today*, 2019, 35(02), 44–49. **View Paper**
18. A. D. Godase, Properties of k-Fibonacci and k-Lucas Octonions, *Indian Journal of Pure and Applied Mathematics*, 2019, 50(04), 979–-998. **View Paper**
19. A. D. Godase, Hyperbolic k-Fibonacci and k-Lucas Octonions, *Notes on Number Theory and Discrete Mathematics* , 2020, 26(03), 176–188. **View Paper**
20. A. D. Godase, Hyperbolic k-Fibonacci and k-Lucas Quaternions, *Mathematics Student*, 2021, 90(1-2), 103–116. **View Paper**
21. E. Özkan, M. Uysal and A. D. Godase, Hyperbolic k-Jacobsthal and k-Jacobsthal-Lucas Quaternions, *Indian Journal of Pure and Applied Mathematics*, 2021, 53(04), 956–-967. **View Paper**
22. A. D. Godase, Binomial Sums with k-Jacobsthal and k-Jacobsthal-Lucas Numbers, *Notes on Number Theory and Discrete Mathematics* , 2022, 28(03), 466–-476. **View Paper**
23. A. D. Godase, Some Binomial Sums of -Jacobsthal and -Jacobsthal-Lucas Numbers, *Communications in Mathematics and Applications* , 2023, 14(01), 143–-152. **View Paper**
24. A. D. Godase, Some new properties of hyperbolic k-Fibonacci and k-Lucas Octonions, *Notes on Number Theory and Discrete Mathematics* , 2024, 30(01), 100–-110. **View Paper**
25. A. D. Godase, Some Binomial Sums of k-Pell, k-Pell-Lucas and Modified k-Pell Numbers, *Proof* , 2025, 24-04(15), 153–-157. **View Paper**
26. A. D. Godase, New Summation Identities of Hyperbolic k-Fibonacci and k-Lucas Quaternions , *Notes on Number Theory and Discrete Mathematics* , 2025, 31(03), 570–582. **View Paper**

Books

1. A. D. Godase, *Advances in Computational Mathematics*, Educational Publishers, Aurangabad, **ISBN:** 9789380876863, (2013). **View Book**
2. A. D. Godase, *Groups using Graphs*, Create Space Independent Publishing Platform by Amazon & Kindle, **ISBN: 10:** 1519189540 **13:** 978-1519189547 , (2015). **View Book**
3. A. D. Godase, *Undergraduate Course in Number Theory*, Amazon Asia-Pacific Holdings Private Limited, **ISBN:** 979-8522711788, (2021). **View Book**
4. A. D. Godase, *Generalized Fibonacci Sequences*, Lambert Academic Publishing, **ISBN:** 978-620-0-29409-8, (2022). **View Book**
5. A. D. Godase, *Comprehensive Guide to Abstract Algebra*, Lambert Academic Publishing, **ISBN:** 978-620-8-43350-5, (2025). **View Book**
6. A. D. Godase, *Introduction to LaTeX*, Lambert Academic Publishing, **ISBN:** 978-620-8-44434-1, (2025). **View Book**

Conference Proceedings

1. A. D. Godase, Recurrent Formulas of the Generalized Fibonacci Sequences of third and fourth order, *National Conference 'Advances in Computational Mathematics'*, ISBN No. 9789380876863, 2015. **View Paper**
2. A. D. Godase, On Some New Identities Concerning the Generalized k-Lucas Sequence and its Companion Sequence, *National Conference on 'Innovative Research in Science & Technology'*, 2019. **View Paper**
3. A. D. Godase, Some New Properties of -Pell, -Pell-Lucas and Modified -Pell Numbers, *International Conference on Mathematical Science and its Recent Advancements ICMSRA–2022*, ISBN No. 9789391347000, 2022. **View Paper**
4. A. D. Godase, Some New Properties of Hyperbolic k-Fibonacci Quaternions, *International Virtual Conference on Progress in Mathematics Towards Industrial Applications (PMTIA-2022)* , ISBN No. 9788195769537, 2022. **View Paper**

Paper presented in the conferences

1. On Some more Identities for Hyperbolic k-Fibonacci and k-Lucas Sedenions, International Conference on Advances in Applied Mathematics (ICAAM – 2024), *January 10 – 11, 2024*, Department of Mathematics University College of Science, Tumkur University B H Road, Tumakuru Karnataka, India.
2. On the Properties of k-Fibonacci Sedenions, International e-Conference on "Recent Trends in Advancement of Mathematical and Physical Sciences", 22/05/2020-23/05/2020, Deva Nagri College, Meerut.
3. Hyperbolic k-Fibonacci Quaternions and Octonions, National E-conference on 'Interdisciplinary Research in Science and Technology' (NCIRST-20), May 30–31, 2020, Amiruddaula Islamia Degree College, Lucknow (U.P.), India.
4. Hyperbolic k-Fibonacci Sedenions, International Web Conference on 'Science, Engineering & Technology' (IWCSET-2020), May 15–16, 2020, Society for Technologically Advanced Materials of India (STAMI).
5. On Some Properties of k-Jacobsthal Numbers, International Conference on Mathematical Science and its Recent Advancements (ICMSRA – 2022), May 05–07, 2022, Department of Mathematics, Rathinam College of Arts and Science (Autonomous), Rathinam TechZone, Pollachi Road, Eachanari, Coimbatore–641021.
6. Some new properties of hyperbolic k-Fibonacci quaternions, International virtual Conference on Progress in Mathematics towards Industrial Applications (PMTIA-2022), October 28–29, 2022, Department of Mathematics, SRMIST, Ramapuram, Chennai - 600089.

Editors/Editorial members of Journals

- **Managing Editor**
  Indian Journal in Number Theory
- **Associate Editor**
  International Journal of Theoretical and Applied Mathematics
- **Associate Editor**
  Journal of Mathematical Problems, Equations and Statistics

Lectures delivered

1. Introduction to LaTeX typesetting language, One day Orientation on "Dimensions of Curriculum, Teaching-Learning and Evaluation in Mathematics", V. P. College Vaijapur, June 24, 2016.
2. The golden ratio in nature, Professor Prabodhini, V. P. College Vaijapur, August 28, 2016.
3. Srinivasa Ramanujan: The Man who knew infinity, Mathematics Day-2023, Balbhim College Beed, December 22, 2023.

E–content developed (Lecture Videos)

T. Y. B.Sc. (Semester-VI)

MAT-601 (Real analysis-II)

1. Syllabus, definition of metric and metric space
2. Limits in metric spaces and continuous functions on metric spaces
3. Open sets
4. Closed sets
5. More about open sets & connected sets
6. Complete metric spaces
7. Compact metric spaces
8. Sets of measure zero
9. Upper sum and lower sum
10. Definition of Riemann integrable function
11. Properties of Riemann integrable function
12. Definition of Fourier series
13. Examples on Fourier series

T. Y. B.Sc. (Semester-V)

MAT-501 (Real analysis-I)

1. Syllabus, sets and relations
2. Sets and relations part-II
3. Functions and real valued functions-I
4. Functions and real valued functions-II
5. Maximum and minimum of real valued functions, characteristic function
6. Properties of characteristic function
7. Equivalence and countability
8. Examples on countable set
9. Real numbers, the least upper bounds
10. Series of real numbers and Jacobians

T. Y. B.Sc. (Semester-V)

MAT-502 (Group theory and Ring theory)

1. Sets, functions and integers-I
2. Sets, relations and integers-II
3. Sets, relations and integers-III
4. Divisibility, congruence relation, the greatest common divisor and least common multiple

S. Y. B.Sc. (Semester-IV)

MAT-401 (Numerical analysis)

1. Syllabus and introduction to numerical analysis
2. Bisection method
3. False position method
4. Problems on false position method
5. Newton-Raphson method
6. Examples on Newton-Raphson method
7. Generalized Newton's method

8. Forward and backward differences
9. Forward and backward differences-II
10. Finite differences and relations between them
11. Newton's forward and backward difference interpolation formula
12. Lagrange's interpolation formula
13. Newtons general interpolation formula
14. Curve fitting (The Least square curve fitting method)
15. Approximation of functions (Chebyshev polynomial)
16. Gauss elimination and Gauss-Jordan method-I
17. Gauss elimination and Gauss-Jordan method-II
18. Method of factorization
19. Jacobi's and Gauss Seidel iterative method
20. Eigenvalue problem
21. Taylor' series method
22. Picard's method
23. Euler's method
24. Runge-Kutta method

S. Y. B.Sc. (Semester-III)

MAT-301 (Number theory)

1. First principle of mathematical induction
2. Division Algorithm
3. Examples on division algorithm
4. Greatest common divisor
5. Properties of divisibility relation
6. Chinese remainder theorem, Fermat's theorem, number theoretic functions and Euler's generalization of Fermat's theorem

F. Y. B.Sc. (Semester-I)

MAT-101 (Differential calculus)

1. Introduction to Differential calculus

F. Y. B.Sc. (Semester-I)

MAT-102 (Differential equations)

1. Introduction to Differential equations

F. Y. B.Sc. (Semester-II)

MAT-201 (Integral calculus)

1. Syllabus and Reduction formula-I
2. Reduction formula-2
3. Reduction formula-3
4. Reduction formula-4 & 5
5. Some important formulae
6. Integration of algebraic rational functions-Type-I(Non-repeated linear factors at denominator)
7. Integration of algebraic rational functions-Type-II(Non-repeated or repeated linear factors at denominator)
8. Integration of algebraic rational functions-Type-III(Linear or quadratic non-repeated factors at denominator)
9. Integration of Trigonometric Functions $\sin^n x$ (if n is an odd integer)
10. Integration of Trigonometric Functions $\sin^n x$ (if n is an even integer)
11. Integration of $\sin^n x$, from 0 to $\frac{\pi}{2}$
12. Integration of $\cos^n x$ (Part-1)
13. Integration of $\cos^n x$ (Part-2)
14. Integration of $\cos^n x$ (Part-3)
15. Integration of $\cos^n x$, from 0 to $\frac{\pi}{2}$
16. Definite integral as the limit of sum
17. Areas of plane regions

18. Rectification, length of plane curves
19. Volumes and surfaces of revolution
20. Line integral, Surface integral and Volume integral
21. Gauss divergence theorem
22. Stoke's theorem and Green's theorem

Skills

Teaching & Development

- Taught undergraduate and postgraduate mathematics courses across multiple colleges.
- Participated in multiple Faculty Development Programs and Refresher Courses, including A. R. P. I. T. programs on educational architecture and Indian science history.

Research

- **Mathematical Modeling:** Expertise in constructing and analyzing recursive sequences and their algebraic properties.
- **Matrix Methods:** Applied matrix techniques to derive identities and summation formulas.
- **Hypercomplex Number Systems:** Worked extensively with quaternions and octonions in the context of Fibonacci-like sequences.
- **Collaborative Research:** Co-authored papers with international scholars, indicating strong teamwork and interdisciplinary engagement.
- **Grant Recipient:** Received U. G. C. funding for the project "Groups as Graphs" (2013–2015).

Computational & Analytical Tools

- **Symbolic Computation Software:** Likely proficient in tools such as:
  1. **MATLAB** or **Mathematica** for matrix operations and symbolic algebra.
  2. **Maple** for recursive sequence analysis.
- **LaTeX:** Expert in mathematical typesetting for academic publishing.
- **Data Analysis:** Uses mathematical modelling to analyze patterns and properties in number sequences.

Contribution in various Committees

- **V. P. College Vaijapur, Aurangabad** [July 2011–Till date]
  1. Admission committee
  2. Timetable committee
  3. I. Q. A. C. Committee
  4. Feedback Committee
  5. Local governing Committee
  6. U. G. C. Committee
  7. Online teaching Committee
  8. Website Committee
  9. Anti-ragging Committee
  10. N. E. P. C Coordination Committee
  11. U. G. C. Coordinator
  12. I. Q. A. C. Coordinator
  13. Examination Committee
  14. Research Committee
  15. N. A. A. C. Criteria–I Coordinator
  16. Member of university paper setting Committee
  17. Member of university syllabus designing Committee
- **Shri. Muktanand College Gangapur, Aurangabad** [July 2010–July 2011]
  1. Admission committee
  2. Timetable committee
  3. Committee of advanced and slow learners

- **S.M.B.S.T. College Sangamner, Ahmednagar** [June 2006–April 2010]
  1. Admission committee
  2. Timetable committee
  3. Examination Committee
- **Sangamner college Sangamner, Ahmednagar** [August 2005–April 2006]
  1. Timetable committee
  2. Internal Examination Committee

Extension Work

- Presiding officers in Gram panchayat Elections 2010.
- A resource person in Remedial courses for weaker students & minorities sponsored by UGC in Shri Muktanand College, Gangapur.
- Presiding Officer in Zillah Parishad & Panchayat Samiti Elections in2012.
- Presiding Officer in Lok Sabha Elections in 2014.
- Presiding Officer in Assembly Elections in 2014.
- Presiding Officer in Zillah Parishad & Panchayat Samiti Elections in2017.
- Presiding Officer in Lok Sabha Elections in 2019.
- Presiding Officer in Assembly Elections in 2019.
- Presiding Officer in Lok Sabha Elections in 2024.
- Presiding Officer in Assembly Elections in 2024.

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