

CURRICULUM VITAE

- I. (a) **Name:** Michael **ENIOLUWAFE.**
 (Formerly: ALAWODE, Michael Adedapomola)
- (b) **Date of Birth:** 27 April, 1959
- (c) **Department:** Mathematics.
- (d) **Faculty:** Science.
- II. (a) **First Academic Appointment :** Assistant Lecturer (1 February, 1994)
- (b) **Present Post (with date):** Senior Lecturer, 1 October, 2008
- III. **University Education (with dates):**
- | | | |
|--|-------------|--|
| (a) University of Benin (Undergraduate) | 1981 - 1985 | |
| (b) University of Ibadan (M.Sc. Program) | 1988 - 1990 | |
| (c) University of Ibadan (Ph.D. Program) | 1994 - 1999 | |
- IV. **Academic Qualifications (with dates and granting bodies):**
- | | | |
|--------------------------------|----------------|----------------------|
| (a) B.Sc. (Hons.) Mathematics, | February, 1986 | University of Benin |
| (b) M.Sc. Mathematics, | April, 1990 | University of Ibadan |
| (c) Ph.D. Mathematics, | February, 1999 | University of Ibadan |
- V. **Scholarships, Fellowships and Prizes (with date) in respect of Undergraduate and Postgraduate work only**
- | | |
|--|-------------|
| (a) Best Student in Faculty of Science, University of Benin | 1982 - 1985 |
| (b) Awarded University Scholarship | 1982 - 1985 |
| (c) Visiting Scientist, The Abdus Salam International Centre for Theoretical Physics (ICTP) Trieste, Italy | 1991 - 1993 |

VI. **Honours, Distinctions and Membership of Learned Societies:**

- (a) Regular Research Associate, The Abdus Salam ICTP, Trieste, Italy
- (b) Member, Nigerian Mathematical Society
- (c) Member, Nigerian Association of Mathematical Physics

VII. **Details of Teaching/Work Experience:**

a. **Work Experience**

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|--|------------------------|
| (i) Assistant Lecturer, Mathematics Department | Feb, 1994 – Sept, 1997 |
| (ii) Lecturer Grade II, Mathematics Department | Oct, 1997 – Sept, 1999 |
| (iii) Lecturer Grade I, Mathematics Department | Oct, 1999 – Sept, 2008 |
| (iv) Senior Lecturer, Mathematics Department | Oct, 2008 – Till Date |

b. **Teaching Experience**

(i) **Undergraduate**

(Participated in the teaching of the following courses)

- MAT 101 - Supplementary Mathematics
- MAT 141 –Analytic Geometry and Mechanics
- MAT 213 - Algebra for Non- Mathematics Majors
- MAT 242 – Vectorial Mechanics
- MAT 212 - Linear Algebra
- MAT 211 - Abstract Algebra
- MAT 311 - Groups and Rings
- MAT 312 -Theory of Modules
- MAT 323 – Complex Analysis
- MAT 401 - Advanced Algebra I
- MAT 402 - Advanced Algebra II
- MAT 407 - Complex Analysis
- MAT 499 - Project Supervision

(ii) **Postgraduate**

(Participated in the teaching of the following courses)

- MAT 701 - Group Representation Theory
- MAT 708 - Commutative Algebra
- MAT 709 - Basic Algebra K-Theory
- MAT 710 - Homological Algebra
- MAT 799 – Project Seminar

(c) Project Supervision**Total Undergraduate Projects Supervised**

Already Completed: B. Sc	20
In Progress: B. Sc	1

Total Postgraduate Projects Supervised

Already Completed	
(i) M.Phil.	1
(ii) Ph.D.	2
In progress : M.Sc	6
M.Phil	1
Ph.D	2

(d) Administrative Responsibilities/Community Service:

(a) Departmental Curriculum Officer (Undergraduate):	1994 – 1995
(b) Member, Faculty of Science Curriculum Committee:	1997 – 1998
(c) Departmental Examination Coordinator:	2000 – 2002
(d) Departmental Examination Coordinator:	2007 – 2012
(e) Departmental Deputy Coordinator, DLC:	2007 – 2012
(f) Member, Departmental Finance Committee:	2000 – 2002
(g) Member, Departmental Finance Committee:	2010 till date
(h) Senate Representative, Senior Staff Housing Committee:	2008 - 2015
(i) Assistant Warden, Tedder Hall:	2007 – 2011
(j) Congregation Representative in Senate:	2007 – 2011
(k) Chairman, Inspection Sub-Committee, Senior Staff Housing Committee:	2009
(l) Chairman, Organizing Committee Distinguished lecture by Professor A. O. Kuku, University of Ibadan:	2012
(m) Departmental Postgraduate Coordinator:	2015 - 2020
(n) Acting Head, Department of Mathematics, UI:	2020 till date

VIII. RESEARCH**(a) Completed**

- i. On Units of Burnside Rings of Cyclic Groups.
- ii. On Units of Burnside Rings of Elementary Abelian 2-Groups.
- iii. On a connection between Units of Burnside Rings and the Exterior Algebra of Elementary Abelian 2-Groups.
- iv. On the number of Cyclic Quotients of some Abelian p-Groups.

- v. On the precise order of Unit Group of Burnside Rings of some Finite Abelian Group.
- vi. On Counting Subgroups of Finite Non-Metacyclic 2-Groups having no

Elementary Abelian Subgroup of Order 8.

(b) **In Progress:**

- i. The Burnside ring module structure

It is desirable to consider the Burnside ring module structure on the units of Burnside rings (which started with my Ph.D. thesis in 1999). So far, we have published two papers on this. My aim is to extend the work for other interesting finite groups or more generally for an arbitrary finite group.

- ii. The Burnside ring as a Green functor

The study of a Burnside ring of a finite group as a Green functor on the category of finite G -sets is a way of possibly getting general results and show that the units is a Mackey functor which is a module over the Green functor. This work began in the year 2015.

- iii. Counting subgroups for a class of finite nonabelian p -groups

The study on counting subgroups for a class of finite nonabelian p -groups is a combinatorial problem, which started in 2016 with my Ph.D. students. We establish and prove formulae for the number of subgroups of these groups which are ongoing. The work was completed for the group of type: $D_{2^{n-1}} \times C_2$, $n > 2$, where $D_{2^{n-1}}$ is a dihedral group of order 2^{n-1} and C_2 a cyclic group of order 2.

- iv. Classification of Fuzzy p -subgroups

We continue our study on classification of Fuzzy p -subgroups, which started in 2017 with my Ph.D. students. In this study we classify Fuzzy subgroups of the Cartesian product group $D_{2^{n-1}} \times C_{2^n}$, $n > 2$ under a natural equivalence relation on Fuzzy subgroups. The case where C_{2^n} , $n = 2, 3$ and 4 are completed. Our main focus is on the determination of the number of distinct Fuzzy subgroups of the group $D_{2^{n-1}} \times C_{2^n}$, $n > 2$. This work is ongoing.

(c) Project, Dissertation and Thesis:

- i. Alawode, M. A. (1985) : On the Quadratic Reciprocity laws, B.Sc. Project, Department of Mathematics, University of Benin, 125p.
- ii. Alawode, M. A. (1990) : Connections between Cyclic Homology and Algebraic K-Theory, M.Sc. Dissertation, Department of Mathematics, University of Ibadan, 156p.
- iii. Alawode, M. A. (1999) : The Units of Burnside Rings of various Finite Groups, Ph.D. Thesis, Department of Mathematics, University of Ibadan, 167p.

IX. PUBLICATIONS**(a) Books already published:**

1. **EniOluwafe, M.** (2008): Algebra for Non - Mathematics Majors. Distance Learning Centre, University of Ibadan, Ibadan 142 pages ISBN 978 - 021 - 356 – 2. (Nigeria)
2. **EniOluwafe, M.** (2009): Vectorial Mechanics. Distance Learning Centre, University of Ibadan, Ibadan 156 pages ISBN 978 - 021 - 422 - 4. (Nigeria)
3. **EniOluwafe, M.**(2013): Advanced Algebra I. Distance Learning Centre, University of Ibadan, Ibadan 93 pages. (Nigeria)
4. **EniOluwafe, M.**(2014): Advanced Algebra II. Distance Learning Centre, University of Ibadan, Ibadan 103 pages. (Nigeria)

(b) **Articles that have already appeared in Refereed Conference Proceedings:**

5. **EniOluwafe, M.** (2009): G-Theory of Group Rings for Groups of Elementary Abelian p-Groups. *Advances In Mathematics , Proceedings of a Memorial Conference in honour of late Professor C.O.A. Sowunmi.* Vol 1 225 - 228:University of Ibadan, (Nigeria)
6. **EniOluwafe, M.** (2015): Counting Subgroup Formula for the Groups Formed by Cartesian Product of the Generalized Quaternion Group With Cyclic Group of Order Two. *Perspectives and Developments in Mathematics, Proceedings of Conference in honour of Professor S.A. Ilori.* pp 143 - 146: University of Ibadan, (Nigeria)
7. Oke, N. O., **EniOluwafe, M.** (2015): On Finite p-Groups All of whose Cyclic Subgroups A, B With $A \cap B \neq \{1\}$ Generate an Abelian Group. *Perspectives and Developments in Mathematics, Proceedings of Conference in honour of Professor S.A. Ilori.* pp 183 - 189: University of Ibadan, (Nigeria)
8. Akor, O. A., **EniOluwafe, M.** (2015) On Classification of Finite p-Groups All of whose Proper Subgroups Are of Class ≤ 2 . *Perspectives and Developments in Mathematics, Proceedings of Conference in honour of Professor S.A. Ilori.* pp 343 - 361: University of Ibadan, (Nigeria)

(c) **Articles that have already appeared in Learned Journals:**

9. **Alawode, M. A.** (1999): Units of Burnside Rings of Cyclic Groups. *Journal of Science Research, Faculty of Science, University of Ibadan,* Vol. 5; No. 1; 32 - 37 (Nigeria)
10. **Alawode, M. A.** (2001): Units of Burnside Rings of Elementary Abelian 2-Groups. *Journal of Algebra,* Vol. 237; 487 - 500: (United States of America)
11. **Alawode, M. A.** (2001): A connection between Units of Burnside Rings and the Exterior Algebra of Elementary Abelian 2-Groups. *Journal of Algebra,* Vol. 240; 836 - 858: (United States of America)

12. **EniOluwafe, M.** (2007): On the Number of Cyclic Quotients of some Abelian p-Groups. *Journal of the Nigerian Association of Mathematical Physics*, Vol. 11; 33 - 38 (Nigeria)

13. **EniOluwafe, M.** (2008): On the Precise Order of Unit Groups of Burnside Rings of some Finite Abelian Group. *Journal of the Nigerian Association of Mathematical Physics*, Vol. 12; 23 - 28 (Nigeria)

14. Olusa, O. S., Ilori, S. A. and **EniOluwafe, M.** (2013): Projective resolutions and the homology of an induced group. *Int. J. Algebra*, Vol. 7 no. 5-8, 245-250 (Bulgaria)

15. Olusa, O.S., Ilori, S. A. and **EniOluwafe, M.**, (2013): On the extension problem and the nil groups of rings of finite global dimension. *Int. Math. Forum*, Vol 8, no. 13-16, 653-658 (Bulgaria)

16. **EniOluwafe, M.**, (2014): Counting subgroups of finite non- metacyclic 2-groups having no elementary abelian subgroup of order 8. *IOSR Journal of Mathematics*, Vol. 10, Issue 5 Ver II pp. 31-32 (India)

17. **EniOluwafe, M.**, (2015): Counting subgroups of type: $D_2^{(n-1)} \times C_2$, $n \geq 3$. *African Journal of Pure and Applied Math.*, Vol. 2 Numéro 1, pp. 25-27 (Cameroon)

18. Ogiugo, M. E. and **EniOluwafe, M.**, (2017): Classifying a class of the fuzzy subgroups of the alternating groups A_n . *African Journal of Pure and Applied Math.*, Vol. 4 Numéro 1, pp. 34-43 (Cameroon)

19. Olapade, O. O. and **EniOluwafe, M.**, (2017): On counting subgroups for a class of finite nonabelian p-groups and related problems. *African Journal of Pure and Applied Math.*, Vol. 4 Numéro 1, pp. 44-50. (Cameroon)

20. Adebisi, S. A. and **EniOluwafe, M.**,(2017): Exhibition of normal distribution in finite p-groups. *American Journal of Mathematics and Statistics.*, Vol. 7 Number 4, pp. 166-168. (United States of America)
21. Adebisi, S. A. and **EniOluwafe, M.**,(2020): An explicit formula for the number of distinct Fuzzy subgroups of the Cartesian product of the dihedral group of order 2^n with a cyclic group of order 2. *Universal J. of Mathematics and Mathematical Sciences*, Vol 13, no. 1, 1-7 (India)
22. Olayiwola A. and **EniOluwafe, M.**,(2019): Combinatorics of counting distinct Fuzzy subgroups of certain dihedral group. *Journal of Quality Measurement and Analysis*, Vol. 15 Number 1, pp. 53-64 (Malaysia)
23. Adebisi, S. A., Ogiugo, M. and **EniOluwafe, M.**,(2020): The explicit formula for the number of the distinct Fuzzy subgroups of the Cartesian product of the dihedral group of order 2^n with a cyclic group of order eight. *Intern. J. Fuzzy Mathematical Archive*, Vol 18, no. 1, 41-43 (China)
24. Adebisi, S. A., Ogiugo, M. and **EniOluwafe, M.**,(2020): Distinct Fuzzy subgroups for the Nilpotent p-group of $D_2^n \times C_4$. *International J. Math. Combin.*, Vol 1, 86-89 (China)
25. Adebisi, S. A., Ogiugo, M. and **EniOluwafe, M.**,(2020): Determining the Number of Distinct Fuzzy Subgroups for the Abelian Structure. $Z_4 \times Z_2^{n-1}$, $n > 2$. *Transactions of the Nigerian Association of Mathematical Physics*, Vol 11, 5-6 (Nigeria)
26. Ogiugo, M. E. and **EniOluwafe, M.**,(2018): A new equivalence relation for the classification of Fuzzy subgroups of symmetric S_4 . *Transactions of the Nigerian Association of Mathematical Physics*, Vol 6, 168-172 (Nigeria)

(d) **Books, Chapters in Books and Articles already accepted for Publication:**

27. Ogiugo, M. and **EniOluwafe, M.** (2016): On the number of fuzzy subgroups of a symmetric group S_5 . Has been accepted for publication in *International Journal of Algebra*, (Paper IJA 6742) July 28, 2016. (India)

(g) **Technical Reports and Monographs:**

28. **EniOluwafe, M.** (2009): A vector matrix approach of counting cyclic quotients of some abelian p -groups. *ICTP Preprint No. IC 200985*: (Italy)

X. TEN BEST PUBLICATIONS THAT REFLECT THE TOTALITY OF MY CONTRIBUTIONS TO SCHOLARSHIP

1. **Alawode, M. A.** (1999): Units of Burnside Rings of Cyclic Groups. *Journal of Science Research, Faculty of Science, University of Ibadan*, Vol. 5; No. 1; 32 - 37 (Nigeria)
2. **Alawode, M. A.** (2001): Units of Burnside Rings of Elementary Abelian 2-Groups. *Journal of Algebra*, Vol. 237; 487 - 500: (United States of America)
3. **Alawode, M. A.** (2001): A connection between Units of Burnside Rings and the Exterior Algebra of Elementary Abelian 2-Groups. *Journal of Algebra*, Vol. 240; 836 - 858: (United States of America)
4. **EniOluwafe, M.** (2007): On the Number of Cyclic Quotients of some Abelian p -Groups. *Journal of the Nigerian Association of Mathematical Physics*, Vol. 11; 33 - 38 (Nigeria)
5. **EniOluwafe, M.** (2008): On the Precise Order of Unit Groups of Burnside Rings of some Finite Abelian Group. *Journal of the Nigerian Association of Mathematical Physics*, Vol. 12; 23 - 28 (Nigeria)
6. Olusa, O. S., Ilori, S. A. and **EniOluwafe, M.** (2013): Projective resolutions and the homology of an induced group. *Int. J. Algebra*, Vol. 7 no. 5-8, 245-250 (Bulgaria)

7. Olusa, O.S., Ilori, S. A. and **EniOluwafe, M.**,(2013): On the extension problem and the nil groups of rings of finite global dimension. *Int. Math. Forum*, Vol 8, no. 13-16, 653-658 (Bulgaria)
8. Adebisi, S. A. and **EniOluwafe, M.**,(2017): Exhibition of normal distribution in finite p-groups. *American Journal of Mathematics and Statistics.*, Vol. 7 Number 4, pp. 166-168. (United States of America)
9. Adebisi, S. A. and **EniOluwafe, M.**,(2020): An explicit formula for the number of distinct Fuzzy subgroups of the Cartesian product of the dihedral group of order 2^n with a cyclic group of order 2. *Universal J. of Mathematics and Mathematical Sciences*, Vol 13, no. 1, 1-7 (India)
10. Olayiwola A. and **EniOluwafe, M.**,(2019): Combinatorics of counting distinct Fuzzy subgroups of certain dihedral group. *Journal of Quality Measurement and Analysis*, Vol. 15 Number 1, pp. 53-64 (Malaysia)

XI. **Major Conferences Attended With Papers Read(in the last 5 years):**

1. Conference on Perspectives and Developments in Mathematics in Honor of Professor S.A. Ilori, Department of Mathematics, University of Ibadan, Nigeria. (January, 2015).

Paper Presented: **EniOluwafe, M.** : Counting Subgroup Formula for the Groups Formed by Cartesian Product of the Generalized Quaternion Group With Cyclic Group of Order Two.

2. AIMS-Volkswagen Stiftung Workshop on Introduction to Computer Algebra and Applications, Douala (Cameroon) from October 6th to October 13th, 2017.

Paper Presented: **EniOluwafe, M.**: Counting subgroups of finite non-metacyclic 2-groups having no elementary abelian subgroup of order 8.

3. 19th Workshop on Algebra and Logic, Yaoundé, Cameroun. August 24-27, 2015.

Paper Presented: **EniOluwafe, M.:** Counting subgroups of type:
 $D_2^{(n-1)} \times C_2$, $n \geq 3$.

4. Conference in Honor of Professor G. O. S. Ekhaguere, Department of Mathematics, University of Ibadan, Nigeria. (May, 2018).

Paper Presented: Ogiugo, M. E. and **EniOluwafe, M.:** A new equivalence relation for the classification of Fuzzy subgroups of symmetric S_4 .

RESEARCH FOCUS

My research interests are in the broad area of Pure Mathematics and with focus and contributions in two major areas. The first is the study of group of multiplicative units of Burnside ring of various finite groups. This aspect of my research falls in the area of Algebra (K_0 –Theory) and the other is the classification and enumeration of Fuzzy p –subgroups and classical p –subgroups, respectively, in the area of Groups of Prime Power Order.

The units of Burnside ring $B^*(G)$ of a finite group G , just like its Burnside ring $B(G)$ occurs as important invariants such as ordinary homology and cohomology theories, extraordinary homology and cohomology theories, and homotopy theory in algebraic topology. The structure of $B^*(G)$ was identified to be an elementary abelian 2 – group . In particular, finding the rank of $B^*(G)$ should be an easy problem. It is a very hard problem, for example if a group G has odd order, then $B^*(G) = \{+1,-1\}$, but for an arbitrary finite group of even order, not so much is known on this problem. The research problem was completely solved for elementary abelian 2 – groups and cyclic groups G . In addition, a connection between $B^*(G)$ and the associated exterior algebra was derived. The goal is to obtain $B^*(G)$ for arbitrary finite group and generalize the computations of $B^*(G)$ to finite nilpotent and solvable groups.

Another part of my focus is on counting subgroups and classifying Fuzzy subgroups. These techniques have been areas of interest for their wide applications in informatics and Coding theory. In classical and Fuzzy group theories, some results on counting subgroups and classifying Fuzzy subgroups of finite abelian groups and finite nonabelian groups have been established. However, not so much is known on this problem for groups of prime power order. The significant of this focus could enhance the safety of a finite nonabelian based public key.

Dr M. EniOluwafe

Areas of Specialisation: Algebra and its Applications; Groups of Prime Power Order.

Room 302.

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