

PROMOTION RECOMMENDATION
The University of Michigan-Flint
College of Arts and Sciences
Department of Mathematics and Applied Sciences

Olanrewaju Aluko, associate professor of mechanical engineering, with tenure, Department of Mathematics and Applied Sciences, College of Arts and Sciences, is recommended for promotion to professor of mechanical engineering, with tenure, Department of Mathematics and Applied Sciences, College of Arts and Sciences [also associate professor of innovation and technology, without tenure, College of Innovation and Technology].

Academic Degrees:

Ph.D.	2006	Howard University, Mechanical Engineering, Washington DC
M.S.	1995	University of Ilorin, Mechanical Engineering, Ilorin, Nigeria
B.S.	1989	University of Ilorin, Mechanical Engineering, Ilorin, Nigeria

Professional Record:

2022-Present	Associate Professor of Innovation and Technology, University of Michigan-Flint
2014-Present	Associate Professor of Mechanical Engineering, University of Michigan-Flint, Michigan
2009-2014	Assistant Professor of Mechanical Engineering, University of Michigan-Flint, Michigan

Summary of Evaluation:

Teaching: Professor Aluko has successfully taught a variety of engineering courses. Course content ranges from undergraduate statistics (IOE 200) to advanced graduate study (EGR 510). Three new courses have been developed since earning tenure. Content has been delivered in multiple modes (face-to-face, online synchronous and asynchronous). Courses serve the mechanical engineering major and the digital manufacturing technology program in the College of Innovation and Technology.

Professor Aluko's teaching philosophy emphasizes practical application. The design of activities, assignments and assessments enables students to connect theory and practice. Group projects are well executed and prepare students for careers that involve team-based work. His teaching is praised by both students and peers. Students' report that Professor Aluko is "...very passionate about the class and subject, which made you want to also be enthused about it." Professor Aluko skillfully integrates content such that students recognize the connection to other courses as well as to industry.

Professor Aluko is an active student advisor. He has regularly counseled students on matters related to internships, graduate admissions and employment. He has also served as a mentor for several student research projects that led to conference presentations and publications. Professor Aluko is appropriately engaged in program assessment and accreditation. He has also been highly engaged in program planning for the College of Innovation and Technology.

Research: Professor Aluko's research focuses on understanding mechanical behavior of materials and structures across different scales. More specifically, Professor Aluko's research explores nano composite materials including graphene. He studies the extensive properties of graphene with the intention to produce lighter and stronger materials. Nine journal articles and eight conference papers have been produced since his promotion to associate professor in 2014. Professor Aluko is the lead author on nearly all projects. Professor Aluko has participated in NASA's Glenn Faculty Fellowship Partnership program

multiple times. This allowed him to expand his research activities to include other materials including ceramics and metal matrix composites. This led to two conference papers and facilitated future activity. He has also earned a variety of internal grants. Professor Aluko has a National Science Foundation (NSF) grant under review and multiple works in progress.

Recent and Significant Scholarly Activity:

- O. Aluko, M. Vaziri, T. Brown, G. Knowles “Graphene-Enhanced Fracture Resistance of Epoxy Nanocomposites for Structural Applications.” *Journal of Mechanics Engineering and Automation*, vol. 10, no 5, Dec. 2020. doi: 10.17265/2159-5275/2020.05.003
- O. Aluko, S. Gowtham, G.M. Odegard “The Assessment of Carbon Nanotube (CNT) Geometry on the Mechanical Properties of Epoxy.” *Journal of Micromechanics and Molecular Physics*, vol.5, no 3, 2020. doi: 10.1142/S2424913020500058
- Z. Broughman, N. Parks, T. Brown, O. Aluko, M. Vaziri “Experimental Analysis of Epoxy and Graphene Nanoplatelet/Epoxy Composites.” *Journal of Engineering Mechanics and Automation*, vol 9, no 2, 49-55, February 2019

Service: Professor Aluko has served his program, the college and university in a variety of ways and has demonstrated increasing leadership in his roles. Within his department, he has served on a promotion and tenure committee, as well as several review and search committees. Professor Aluko served as the associate chair of engineering for 18 months. During this time, he addressed ABET requirements for self-study submission as well as concerns and follow ups required by the accrediting body. These corrections led to a two-year accreditation of the mechanical engineering program. He completed typical chair responsibilities such as providing feedback on annual reviews and chaired a scholarship committee. He established “Engineers’ Night” a student-faculty forum that creates space for important program and industry related discussions.

At the college level, Professor Aluko has been a member of the Nominating Committee and the Student Support Strategic Plan Implementation committee. For the university, he has served on the General Education Curriculum Committee, as a moderator for the Student Research Conference and Meeting of Minds. He has regularly attended commencement and recruitment events. He is currently a member of the CIT faculty council where he has contributed to curriculum development in the Digital Manufacturing Technology program and in faculty recruitment. Professionally, Professor Aluko has served as a reviewer for multiple journals. He has also organized conference sessions.

External Reviewers:

Reviewer A: “The publications are of high quality and his application of molecular dynamics in characterization of nanocomposites is on the cutting edge of the field.”

Reviewer B: “With his collaborators from NASA Glenn, he published two conference papers to report their research results. This is an important direction which could lead to more interesting research publications. Overall, I think that he has made great scholarly contributions to the above two research topics.”

Reviewer C: “My review of Professor Aluko’s work, while somewhat limited in scope (I am not an expert in molecular dynamics simulations), is generally positive. His publications are well written, of adequate depth, and provide the reader with useful information that adds to the body of knowledge in composite materials, combining advanced modeling techniques with experimental evidence for predicting the behavior and failure characteristics of advanced composites.”

Reviewer D: “Papers published by Professor Aluko scholarly work are of high quality and often address problems that are of timely interest in the broad field of mechanics. This level and quality of scholarship is commendable, given the required teaching responsibilities. The work with collaborators at...on multiscale modeling of graphene nanoplatelet reinforced composites may be singled in this regard. The research results have also been presented at conferences of high repute.”

Reviewer E: “The researcher has developed novel numerical models for predicting mechanical performance of composite structures. Many other researchers have taken some of these models to develop elastic interphase properties of nanoparticle/epoxy nanocomposites in molecular dynamics study. This has provided insight on interfacial structure, stress, and adhesion of carbon fibre/epoxy interface. The numerical and analytical modeling has also led and picked up a few good citations signifying the influence of the work in the research field.”

Reviewer F: “His recent work has focused on molecular dynamics with many publications co authored by Dr. Greg Odegard who I have known for many years.”

Summary of Recommendation:

Professor Aluko is a skilled teacher who provides engaging opportunities that facilitate student learning. He is a productive researcher whose work focuses on properties and characterization of various nanomaterials. His work is impactful, and students are regularly included in the process. Professor Aluko has contributed to a variety of service activities at multiple levels. His leadership as associate chair in engineering was important to ensuring accreditation and program success. It is with the support of the executive committee that I recommend Olanrewaju Aluko for promotion to professor of mechanical engineering, with tenure, Department of Mathematics and Applied Sciences, College of Arts and Sciences.

Recommended by:



Susan Gano-Phillips, Dean
College of Arts and Sciences



Christopher Pearson, Dean
College of Innovation and Technology

Recommendation endorsed by:



Sonja Feist-Price, Provost and
Vice Chancellor for Academic Affairs



Debasish Dutta, Chancellor
University of Michigan – Flint

