

PROMOTION RECOMMENDATION  
The University of Michigan-Dearborn  
College of Engineering and Computer Science

Georges Y. Ayoub, assistant professor of industrial and manufacturing systems engineering, College of Engineering and Computer Science, is recommended for promotion to associate professor of industrial and manufacturing systems engineering, with tenure, College of Engineering and Computer Science.

Academic Degrees:

Ph.D.	2010	University of Lille, France
M.S.	2007	University of Lille, France
B.S.	2004	University of Rennes, France

Professional Record:

2020-present	Program Director, Human-Centered Engineering Design, College of Engineering and Computer Science, University of Michigan-Dearborn
2016-present	Assistant Professor, Industrial and Manufacturing Systems Engineering, College of Engineering and Computer Science, University of Michigan-Dearborn
2014-2016	Assistant Professor, Mechanical Engineering, Faculty of Engineering and Architecture, American University of Beirut
2014-2018	Associate Research Scientist, Mechanical Engineering, Texas A&M University at Qatar
2012-2014	Assistant Research Scientist, Mechanical Engineering, Texas A&M University at Qatar
2011-2012	Post-doctoral Research Scientist, Mechanical Engineering, Texas A&M University at Qatar
2010-2011	Adjunct Assistant Professor, Mechanical Engineering, University of Lille

Summary of Evaluation:

Teaching: Professor Ayoub is an excellent teacher. Since joining the department in the fall of 2016, Professor Ayoub has taught three manufacturing processes related courses in the BSE in Industrial and Systems Engineering and BSE in Manufacturing Engineering programs, and one in the MSE in Manufacturing Systems Engineering and MSE in Automotive Systems Engineering programs. Professor Ayoub also advised 12 undergraduate student teams in their senior design projects, three students in their master's thesis research, one student in his Ph.D. research and one student in his Doctor of Engineering Research. Students consider Professor Ayoub to be an effective and knowledgeable instructor who is always prepared for class. Students had many positive comments about his concern for student learning and his willingness to help. Professor Ayoub played a key role in the development of the new BSE in Human Centered Engineering Design (HCED) program. He led the team of faculty from IMSE and College of Arts, Sciences, and Letters to design the program curriculum and worked with the IMSE faculty and LEO lecturers to develop several core courses for this new program.

Research: Professor Ayoub's research program focuses primarily on material processing to understand the physical, microstructural and chemical characteristics of materials subjected to mechanical loading or environmental aging. He successfully applied his research methodologies in materials science to develop multi-scale physically based material simulation models, optimize

advanced manufacturing processes, model the micromechanical behavior, and predict the fatigue failure of semicrystalline polymer and elastomeric materials. Professor Ayoub published 51 peer-reviewed papers (28 since he joined UM-Dearborn) in highly respected scholarly journals. As a principal and co-principal investigator, Professor Ayoub secured more than \$500K of research funding since 2016.

#### Recent and Significant Publications:

- A.K. Rodriguez, B. Mansoor, G. Ayoub, X. Colin, A.A. Benzerga\*. "Effect of UV-aging on the mechanical and fracture behavior of low density polyethylene." *Polymer Degradation and Stability*, 2020, Impact Factor: 5.03, H index: 169, SJR: 1.229 Q1, 150, 109185.
- A. Dorbane, B. Mansoor\*, G. Ayoub, V.C. Shunmugasamy, A. Imad. "Mechanical, microstructural and fracture properties of dissimilar welds produced by friction stir welding of AZ31B and Al6061." *Materials Science and Engineering A*, 2016, Impact Factor: 5.234, H index: 237, 651, SJR: 1.574 Q1, pp. 720-733.
- G. Ayoub, M. Naït-abdelaziz, F. Zaïri\*, J.M. Gloaguen. "A continuum damage model for the high-cycle fatigue life prediction of styrene-butadiene rubber under multiaxial loading." *International Journal of Solids and Structures*, 2011, Impact Factor: 3.9, H index: 169, SJR: 1.229 Q1, 48(18), pp. 2458-2466.
- G. Ayoub, F. Zaïri\*, M. Naït-Abdelaziz, J.M. Gloaguen. "Modelling large deformation behaviour under loading-unloading of semicrystalline polymers: Application to a high density polyethylene." *International Journal of Plasticity*, 2010, Impact Factor: 7.081, H index: 141, SJR: 2.62 Q1, 26(3), pp. 329-347.

Service: Professor Ayoub's service record is exemplary. At the department level, he serves as a director of the BSE in Human Centered Engineering Design program and he is a member of the BSE in Manufacturing Engineering curriculum committee. In 2017, he chaired IMSE faculty search and served on the IMSE Chair Review Committee. He is a faculty advisor of the Alpha Pi Mu Honor Society. At the college level, he served on the College-Wide Core Theme Committee and he is currently serving on the CECS Grievance Committee. At the university level, he is serving on the Dearborn Discovery Core evaluation committee. Professor Ayoub also contributed to various college and university events by regularly participating in Admitted Student Receptions and in CECS Showcase and CECS Open House events.

#### External Reviewers:

Reviewer (A) "I have to say that I am very impressed with [Professor Ayoub's] publication record. He has 51 refereed journal publications with 5 more in preparation or under review...Moreover, almost all of his publications are in high impact journals in solid mechanics/materials science...Prof. Ayoub is really strong on constitutive modeling of modeling undergoing large deformations. I would venture to say that only a small number of people are this strong."

Reviewer (B) "Dr. Ayoub's standing is comparable to that of Dr. Gary D. Seidel in the Department of Aerospace & Ocean Engineering at Virginia Tech University and Dr. Jeong-Ho Kim in the Institute of Materials Science at the University of Connecticut, who are Associate Professors, and Dr. Marco Salviato, who is an Assistant Professor in the Department of Aeronautics & Astronautics at the University of Washington at Seattle...All of these researchers have published research articles focusing on the mechanics of polymers."

Reviewer (C) “In terms of quantity and quality of scholarly output, Dr. Ayoub has a total of 29 journal publications during his tenure period (2016-present). Such significant amount of publication is impressive at any institutions.”

Reviewer (D) “The students felt that he explained the material clearly and that he treated them ‘with respect and promoted a positive learning environment.’ The student rankings were good and remained relatively high even with the changes in teaching modes during 2020 and 2021.”

Reviewer (E) “In comparing Dr. Ayoub with his peers (by research field and seniority), I conclude that Dr Ayoub is among the top 5% of researchers. I expect that he will be a major leader in the field of mechanics and mechanical behavior of materials. His scholarly accomplishments have been recognized in invited lectures and visiting professorships. His citation record is impressive.”

Reviewer (F) “The majority of these publications are in prestigious journals in the field, including, but not limited to, the International Journal of Fatigue (IF: 5.186), the International Journal of Solids and Structures (IF: 3.9), Journal of Polymer Degradation and Stability (IF: 5.030), the International Journal of Plasticity (IF: 7.081), and Journal of Mechanics and Physics of Solids (IF: 5.471). Notably, the latter is revered by all mechanics since it was established by Professor Hill ‘*to publish the highest quality relating to the mechanics of solid.*’ Publications in these prestigious avenues indicate the rigorous approach Dr. Ayoub’s research group adopted and mark his research results' high quality and potential impact. Moreover, his dedication to mentor or co-mentor seven doctoral students and three master’s students in their research endeavors until the culmination of the project into a peer-reviewed publication is a testament to his academic qualities.”

Reviewer (G) “Based on the numbers of papers published and the journals they are published in, I would comfortably say that Dr. Ayoub has a very strong publication record for someone at his current level of his career. The quality of the papers that I received with the request to write the letter is high...He seemed to have provided a lot of supervision to the student authors of most of the publications listed in his CV.”

Summary of Recommendation: Professor Ayoub has an excellent record in teaching, research, and service. We are very pleased to recommend, with strong support of the College of Engineering and Computer Science Executive Committee, Georges Y. Ayoub for promotion to the rank of associate professor of industrial and manufacturing systems engineering, with tenure, College of Engineering and Computer Science.



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Ghassan T. Kridli, Dean  
College of Engineering and  
Computer Science



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Domenico Grasso, Chancellor  
University of Michigan-Dearborn