Approved by the Regents
May 16, 2024

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

Lei Chen, assistant professor of mechanical engineering, Department of Mechanical Engineering, College of Engineering and Computer Science, is recommended for promotion to associate professor of mechanical engineering, with tenure, Department of Mechanical Engineering, College of Engineering and Computer Science.

Academic Degrees:

Ph.D.	2012	Mechanical Engineering, National University of Singapore, Queenstown, Singapore
M.S.	2007	Materials Processing and Control Engineering, Huazhong University of Science and Technology, Hubei, China
B. S.	2005	Materials Processing and Control Engineering, Huazhong University of Science and Technology, Hubei, China

Professional Record:

2019-present	Assistant Professor, University of Michigan-Dearborn, Dearborn, MI
2015-2019	Assistant Professor, Mississippi State University, Mississippi State, MS
2013-2015	Post-doctoral Researcher, Pennsylvania State University, State College, PA
2012-2013	Research Fellow, University of Southampton, Southampton, United Kingdom
2011-2012	Research Scientist, Institute for High-Performance Computing, Fusionopolis, Singapore

Summary of Evaluation:

Teaching: Professor Chen is rated significantly capable in teaching. He is a key member of the faculty in the materials and manufacturing area, while also contributing to instruction of general mechanical engineering courses. At the University of Michigan-Dearborn, Professor Chen has taught four different mechanical engineering (ME) lecture courses at undergraduate and graduate levels. He has developed and taught one new course ME 568: Computational Materials Design. Professor Chen's teaching evaluations are typically high, with the average of all scores reported in the documentation of teaching effectiveness by the casebook committee being 4.249 on the 5-point scale. The scores exceed the average scores received by the instructors of the ME department courses. Professor Chen's teaching is engaging and challenging. Students in their comments compliment excellent knowledge of the modern aspects of the subject, readiness to help students, and willingness and ability to incorporate recent scientific advancements into class material.

Professor Chen has served as a faculty advisor or co-advisor to six Ph.D. students (three of them at the University of Michigan-Dearborn) and three masters students. The post-graduate placement of the Ph.D. students is outstanding. Five of them are currently post-doctoral researchers at the University of Michigan-Dearborn, University of Michigan-Ann Arbor, Brown University, and Los Alamos National Laboratory. One former student is a faculty member at the Jiangsu Normal University in China. Professor Chen has also been active in work with undergraduate students, having supervised nine research projects and guided studies, four of them at the University of Michigan-Dearborn.

Research: Professor Lei Chen is rated excellent in research. The major areas of the research work are manufacturing and design of lithium-ion batteries, additive manufacturing of metallic materials, deformation-based manufacturing, data-driven modeling in additive manufacturing, and additive manufacturing and computational design of piezo materials.

Professor Chen has received multiple research grants and contracts. He was a principal investigator (PI) on the research awards with a total of $1,221,369 during his work at the University of Michigan-Dearborn, and $324,954 before that. He was also a co-PI on multiple grants, with his share being $187,000 during his work at the University of Michigan-Dearborn and $281,946 prior to that. The majority of Professor Chen's funding as a PI is from the National Science Foundation (NSF) and General Motors, which demonstrates his ability to succeed with both federal agencies and industry. Several high-profile funding proposals, including that for an NSF Faculty Early Career Development Program (CAREER) award, are pending.

The record of research publications by Professor Chen is exceptional. It includes 97 scholarly papers in peer-reviewed journals, 30 of them since joining the University of Michigan-Dearborn in 2019. The list includes publications in highly selective journals, such as *Nature*, *Nature Communications*, *Advanced Materials*, *Advanced Energy Materials*. The Google Scholar citation index of Professor Chen lists 6,000 citations; 4,802 of them in the last five years.

Recent and Significant Publications:

X. Yao, Y. Xiao, Z. Wang, Z. Zhang, W. Cai, L. Chen, "Coarse-grained molecular dynamics simulations of microstructure evolution and debonding in water-based electrode drying." *Journal of Materials Processing Technology*, 2023. Impact Factor: 6.126, H-index: 201. (Q1 journal).

W. Yang, X. Yao, Z. Wang, P. Liu, H. Yan, Y. Xiao, K. Tantratian, L. Chen, "Time-dependent deep learning predictions of 3d electrode particle-resolved microstructure effect on voltage discharge curves." *Journal of Power Sources*, 2023, 579-233087. Impact Factor: 9.07, index: 320. (Q1 journal).

Z. Wang, R. Dabaja, L. Chen, M. Banu, "Machine learning unifies flexibility and efficiency of spinodal structure generation for stochastic biomaterial design," *Scientific Reports*, 2023,13(1): 5414. Impact Factor: 4.543, H-index: 242. (Q1 journal).

Y.H. Xiao, J.R. Su, L. Chen, "Improving cathode stripping efficiency of spent Li-ion batteries for direct recycling based on acoustic vibration technology." *ASME Journal of Manufacturing Science and Engineering*, 2023, accepted. Impact Factor: 3.901, H-index: 103. (Q1 journal)

P. Pirayesh, K. Tantratian, M. Amirmaleki, F. Yang, E. Jin, Y. Wang, L.V. Goncharova, J. Guo, T. Filleter, L. Chen, Y. Zhao, "From nano-alloy to nano-laminated interfaces for highly stable alkali metal anodes." *Advanced Materials*, 2023, 01414. Impact Factor: 28.122, H-index: 563. (Q1 journal).

X. Wang, W. Leng, R.O. Nayanathara, E.B. Caldona, L. Liu, L. Chen, R.C. Advincula, Z. Zhang, X.F. Zhang, "Anticorrosive epoxy coatings from direct epoxidation of bioethanol fractionated lignin." *International Journal of Biological Macromolecules*, 2023, 221: 268-277. Impact Factor: 7.713, H-index: 144. (Q1 journal).

Service: Professor Chen is rated excellent in service. Particularly strong is the record of service to the professional community, which includes membership in editorial boards of two journals,

editorship of several special issues, organization of several mini-symposia and conferences, and service as a reviewer for the NSF and multiple scientific journals.

External Reviewers:
Reviewer A: "Given his impressive achievements so far, I have no doubt that Dr. Chen will have a brilliant career at your institution as a tenured professor. Dr. Chen would receive the tenure and promotion at my institution...."

Reviewer B: "Based on my evaluation of Dr. Chen's application package provided to me, I strongly support his promotion to the rank of associate professor with tenure in the Mechanical Engineering Department at the University of Michigan - Dearborn."

Reviewer C: "In summary, I believe Dr. Chen is clearly establishing himself as a national/ international leader in his area of expertise in advanced manufacturing and materials processing. I am certain that he will make greater contributions to academia and professional societies in the near future. Therefore, I strongly support his promotion to the rank of associate professor with tenure."

Reviewer D: "In summary, Dr. Lei Chen is an outstanding scholar whose contributions to the field of computational materials science and phase field modeling are highly commendable. His dedication, technical prowess, and collaborative spirit make him an exceptional candidate for promotion in the rank of Associate Professor with tenure. I wholeheartedly support his advancement and believe that he will continue to excel in his research and scholarly endeavors."

Reviewer E: "To summarize, based on my review of Dr. Chen's files, he has demonstrated his scholarship through his combined sustained excellence and continuing growth in teaching, student advising, sponsored research, publications, and internal and external service. Dr. Chen merits being promoted to the rank of associate professor with tenure."

Reviewer F: "In summary, it is my opinion that the quality of Dr. Chen's scholarly research is very high and competitive with that produced by tenured, associate professor faculty at most research universities. Therefore, I believe Dr. Chen is qualified for tenure and promotion to associate professor at your university."

Summary of Recommendation: Professor Chen has established himself as an exceptionally productive, successful, and innovative scholar with an established record of excellence in teaching and service. We are very pleased to recommend, with strong support of the College of Engineering and Computer Science Executive Committee, Lei Chen for promotion to associate professor of mechanical engineering, with tenure, Department of Mechanical Engineering, College of Engineering and Computer Science.

Ghassan Kridli, Dean
College of Engineering and Computer Science

Domenico Grasso, Chancellor
University of Michigan-Dearborn

May 2024