

PROMOTION RECOMMENDATION
The University of Michigan – Flint
College of Arts and Sciences
Department of Computer Science, Engineering, and Physics

Quamrul H. Mazumder, associate professor of mechanical engineering, with tenure, Department of Computer Science, Engineering, and Physics, College of Arts and Sciences, is recommended for promotion to professor of mechanical engineering, with tenure, Department of Computer Science, Engineering, and Physics, College of Arts and Sciences.

Academic Degrees:

Ph.D.	2004	University of Tulsa
M.B.A.	1998	Oklahoma State University
M.S.	1988	South Dakota State University
B.S.	1982	Bangladesh Agricultural University

Professional Record:

2012-Present	Associate Professor of Mechanical Engineering, with tenure, University of Michigan – Flint, Michigan
2006-2012	Assistant Professor of Mechanical Engineering, University of Michigan – Flint, Michigan
2005-2006	Assistant Professor, Mechanical Engineering Technology, Pittsburg State University, Kansas
2000-2005	Engineering Program Manager, Honeywell Aerospace, Oklahoma
1985-2000	Senior Project Manager, Flowserve, Texas

Summary of Evaluation:

Teaching – Professor Mazumder is a passionate teacher who believes that every student can be successful if provided the proper learning environment – one that engages students in activity-based and experiential learning. Professor Mazumder utilizes the principles of backward course design which first identifies the necessary knowledge and competencies students must acquire in order to learn the course topics. In addition to careful curricular design, the integration of formative and summative assessments, and the curricular mapping of learning outcomes across the program, Professor Mazumder has provided an excellent foundation for teaching effectiveness within his courses and the courses within the engineering program at the University of Michigan-Flint. Since his arrival at the University of Michigan-Flint, Professor Mazumder has taught eighteen different engineering courses ranging from EGR 465 and EGR 466, Engineering Design I and II (the program's capstone course), to midlevel engineering courses such as EGR 315 "Machine Element Design," EGR 350 "Fluid Mechanics," and EGR 353 "Thermodynamics." Professor Mazumder has also taught introductory courses in Engineering – EGR 102 "Introduction to Engineering" and EGR 165 "Computer Aided Design" – as well as a General Education course on Alternative Energy. During the period between 2012 and 2017, Professor Mazumder has worked with eleven graduate students, seventeen undergraduate students and nine students in independent study courses.

Research – Professor Mazumder is a mechanical engineer specializing in the theories and methods of fluid mechanics – more specifically, the area of particulated multiphase flow which seeks to better understand the spatial distribution of particles and their corresponding velocities which together cause erosion in the inner wall of pipes. To understand these phenomena, Professor Mazumder has developed models using theories of multiphase flow and validated these models using computational and

experimental results. Professor Mazumder has also used a computational fluid dynamics model and programs such as FLUENT to predict fluid and particle velocities in multiphase flow. The results of his research has been published in one of the most prestigious journals in mechanical engineering, the *ASME Journal of Fluid Engineering* which has an acceptance rate between 10 and 15% and an impact factor of 1.35. In addition, Professor Mazumder has presented his work at national and international conferences organized by ASME (American Society of Mechanical Engineers) and ASEE (American Society of Engineering Education) which are leading and prestigious professional organizations in his discipline.

Recent and Significant Scholarly Activity:

Books

Quality in Higher Education-Global Approaches to Improve Sustainable Quality- May 2017, ISBN no.: 978-1-941799-53-6

Introduction to Engineering- An Assessment and Problem Solving Approach, CRC publication, Taylor and Francis Group, USA, February 2016, ISBN number 978-1-4987-4748-6

Academic Enhancement in Higher Education, Quamrul H. Mazumder, Rezaul Karim and Ashiq Ur Rahman, Published by Higher Education Quality Enhancement Project, University Grants, Commission of Bangladesh, December 2013

Refereed Journal Papers

Mazumder, Quamrul H., Hassan, K. "Validation of Computational and Empirical Erosion Models for Multiphase Flow" (Paper submitted to *Journal of Computational Multiphase Flow* - May 2017, currently under review)

Mazumder, Quamrul H. Hassan, K, "Characterization of Erosion in Particulated Flow using CFD and PIV," *The Journal of Computational Multiphase Flow*-Paper no. CMF-17-0005- Submitted March 2017 (Accepted with revision: June 2017, Revised and resubmitted: September 3, 2017)

Mazumder, Quamrul H., "S-Bend Erosion in Particulated Multiphase Flow with air and sand" *The Journal of Computational Multiphase Flows*, 2016, vol. 8(3) 157-166, DOI: 10.1177/1757482X16668363 Mazumder, Quamrul H., Zhao, Siwen, Ahmed Kawshik "Experimental Investigation of Solid Particle Erosion in S-Bend", *ASME Journal of Fluids Engineering*, 2015; 138(4),044501 Paper no. FE-141748, doi: 10.1115/1.4031685

Mazumder, Quamrul H., Zhao, Siwen, Ahmed Kawshik "Effect of Bend Radius on Magnitude and Location of Erosion in S-Bend," *Modeling and Simulation in Engineering* Volume 2015 (2015), Article ID 930497

Service – Professor Mazumder has a strong service record. Since his arrival in the fall of 2006, Professor Mazumder has shared his disciplinary expertise and professional experience with his department, college, university, profession and his local and global communities. At the department level, Professor Mazumder's most outstanding service contributions reside in his work to revitalize the Engineering program and securing ABET accreditation for its Mechanical Engineering program in 2013. For the college, Professor Mazumder has served on the Summer Interim Committees in 2015 and 2016. He has also served on the college's Nominating Committee in 2014. At the university level, Professor Mazumder has participated in numerous initiatives, including the Student Life Task Force of the Strategic Planning Committee (2011-2016), the search committee for the Vice Chancellor for Enrollment Management (2017), the General Education Curriculum Committee (2011-14), the Scholarship Awards and Special Events Committee (2011-14), as well as participating in the Faculty Governance task force ad hoc committee and the General Education review committee. For his profession, Professor Mazumder is also an active leader serving as the vice president of the American Society of Mechanical Engineers- Saginaw Valley Section since 2015. Professor Mazumder is a peer

reviewer for *Journal of Applied Mechanics*, and the *Journal of Fluid Mechanics* (both published by the ASME), and American Society of Engineering Education annual conferences. Professor Mazumder has also been a reviewer for the National Science Foundation and the Fulbright Scholar program. He has given generously of his time and expertise to his local and global communities. Locally, Professor Mazumder works with the Center of Applied Environmental Research at UM-Flint that has developed a study to address the neighborhood flooding issues in the Flint and Burton areas. He is also a member of the Hamilton Dam Committee, the Urban Alternative Housing, the Flint River Watershed Coalition, and is on the advisory board of WINSOL electronics. Internationally, Professor Mazumder has contributed to the development of quality standards in education in Bangladesh, and serves on the advisory boards of three universities in Bangladesh.

External Reviewers:

Reviewer (A): “The quantity and quality of Dr. Mazumder’s publications are excellent. This is evidenced by his 6 journal publications in high quality publications with two journal papers submitted since receiving tenure. His area of research, erosion in pipes, has importance to the scholastic community and to industry. Many of his journal papers have been cited between 20 and 40 times by other researchers. This is quite impressive since not many researchers are conducting erosion research worldwide. ... The paper ‘S-bend in particulated multiphase flow with air and sand’ is an outstanding publication which has a sound theoretical approach supported with good agreement by experimentation. It also includes a very extensive review of relevant literature.

Reviewer (B): “I think that quality, quantity, and scholarly impact of Professor Mazumder is significant and deserves acknowledgment both in educational and scientific field. ... Although there are many publications dealing with erosion process it must be emphasized that he is one of few researchers who experimentally demonstrated particle size influence on the magnitude of erosion. His another attainment is the location of maximum erosion for S-bend geometry, as a small number of such experiments have been described so far. It is also worth emphasizing that Professor Mazumder predicted and successfully validated the model of location of the maximum erosion in S-bend geometry with different air velocities and particle sizes.”

Reviewer (C): “Since 2012, Quamrul has authored or coauthored 11 publications six of which are technical articles in the area of Multiphase Flow and Computational Fluid Dynamic (CFD). Both topics are very important in Fluid Dynamics and Computational Methods in Engineering. Interests in these topics have accelerated over the last two decades. In addition, he has presented 15 technical and nontechnical papers at different conferences in the United States and Bangladesh. In addition, he has published and submitted five technical and nontechnical books including one in 2010. I believe he is a productive faculty in his area and the quality and quantities of his scholarly activities are satisfactory. ... This topic involves contemporary numerical analysis and data structures to solve and analyze problems that involve fluid flows. The Multiphase flow research is also an important branch of fluids in which involves simultaneous flow of materials with different states or phases, or materials with different chemical properties. Since computational tools and techniques to analyze CFD scenarios are changing continuously, the faculty who uses them must stay up-to-date in the field.”

Reviewer (D): “The Symposium was in memory of Professor Clayton T. Crowe (a world-renowned authority in the area) and attracted all the world’s experts in the area of Gas-Solids Flow. The presence and participation of Dr. Mazumder in the Symposium signifies his standing as an internationally known researcher in the area. Of the two papers he presented, one was recommended to be published in a special edition of the *Journal of Fluids Engineering*. ... Dr. Mazumder’s standing in relation to others in his peer group – the younger generation in Gas-Solid Flows – is high. He has had several good

publications; he has received invitations to present his work in prestigious conferences; and he has started contributing parts of his work (both in Multiphase Flows and Education) in books. I am sure that, in a few years, he will become one of the leaders in these fields.”

Reviewer (E): “In the area of traditional research he has been consistently producing very good quality peer reviewed journal and conference papers. His publications in the area of multi-phase flows with particulates in various geometries are of archival value. ... In addition to these, Dr. Mazumder has a passion in pedagogical research and research related to quality in higher education. He has been conducting research that investigates and establishes methods of better teaching and learning in a variety of environments including both public and private institution settings. ... Considering the colleagues who are faculty members working in the same field in his peer group (those in institutions of the same category as UM-Flint) I would place Dr. Mazumder in the top 15%.”

Summary of Recommendation:

Professor Mazumder has demonstrated the requisite excellence in teaching, scholarly achievement, and service. I am pleased to recommend Quamrul H. Mazumder for promotion to professor of mechanical engineering, with tenure, Department of Computer Science, Engineering, and Physics, College of Arts and Sciences.

Recommended by:



Susan Gano-Phillips, Dean
College of Arts and Sciences

Recommendation endorsed by:



Douglas G. Knerr, Provost and
Vice Chancellor for Academic Affairs


Susan E. Borrego, Chancellor
University of Michigan – Flint

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