Approved by the Regents
May 17, 2018

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

Nilay Chakraborty, 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, College of Engineering and Computer Science.

Academic Degrees:

Ph.D.	2008	Mechanical Engineering, University of North Carolina, Charlotte, NC
M.S.	2006	Mechanical Engineering, University of North Carolina, Charlotte, NC
M.B.A.	2003	Indian Institute of Engineering Science and Technology, India
B.E.	2001	Mechanical Engineering, Swami Ramanand Teerth Marathwada University, India

Professional Record:

2012 – present	Assistant Professor, Department of Mechanical Engineering, University of Michigan-Dearborn (UM-D), Dearborn, Michigan, USA.
2010 – 2012	Junior Faculty and Research Associate, Harvard Medical School, Boston, MA
2008 – 2010	Research Fellow, Harvard Medical School, Boston, MA.

Summary of Evaluation:
Teaching: Professor Chakraborty is rated excellent in teaching. He is an effective teacher, as evidenced by the teaching evaluations from both his students and his peers. His average effectiveness from the student evaluation of his classroom teaching over the past five years was above 4.76 out of 5.0. This places him within the top 5% among the ME faculty members. Responses from students interviewed also support the written evaluations. Professor Chakraborty came to the Department of Mechanical Engineering at UM-Dearborn in 2012, after working for four years as a research associate at Harvard University. He put a significant amount of effort in organizing the teaching laboratories for bioengineering and in modifying existing and developing new Bioengineering courses. Since coming to the Dearborn campus, he taught 14 regular course sessions, developed and taught three new courses in Bioengineering. He has supervised eight teams of senior design projects and three undergraduate guided study projects and one graduate guided study project.

Research: Professor Chakraborty is rated excellent in research. His research interest is in the subject areas of biomimetics, cellular engineering, heat transfer, biopreservation and biobanking. Since joining UM-Dearborn, he has obtained four internal and six external grants. Of the six external grants, one was awarded to him as a sole PI from State of Michigan Economic Development Corporation, and he is the co-PI of the other five grants from NSF. The total amount he received to support his research at UMD is ~$361,000, in addition to an NSF MRI grant of $294,324, of which he is a co-PI. He has published a total of eight journal papers, and

19 conference papers since he came to UM-Dearborn in Fall 2012. He supervised five M.S. theses including one in progress, and published their research findings in peer-reviewed journals.

Recent and Significant Publications:

Mohanty, S., Wu, Y., Chakraborty, N., Mohanty, P., Chakraborty, G. Impact of alginate concentration on the viability, cryostorage, and angiogenic activity of encapsulated fibroblasts. *Materials Science and Engineering C*, 2016, 65, 269-277. Impact Factor: 3.42

Zhao, Z., Al-Ameen, M.A., Duan, K., Chakraborty, G., Lo, J. On-chip porous microgel generation for microfluidic enhanced VEGF detection. *Biosensors and Bioelectronics*, 2015, 74, 305-312. Impact Factor: 7.47

Al-Ameen, M.A.; Li, J.; Beer, D.; Chakraborty, G. Sensitive, quantitative, and high-throughput detection of angiogenic markers using shape coded hydrogel microparticles. *Analyst*, 2015,140, 4530-4539. Impact Factor: 4.1

Wu, Y., Guo, B., Chakraborty, G. Differential effects of tumor secreted factors on mechanosensitivity, capillary branching, and drug responsiveness in PEG hydrogels. *Annals of Biomedical Engineering*, 2015, 43, 2279-2290. Impact Factor: 2.887

Ye, M., Mohanty, P., Chakraborty, G. Biomimetic-apatite coated porous PVA scaffolds promote the growth of breast cancer cells. *Materials Science and Engineering C*, 2014, 44, 310-316. Impact Factor: 3.42

Ye, M., Mohanty, P., Chakraborty, G. Morphology and properties of poly vinyl alcohol (PVA) scaffolds: impact of process variables. *Materials Science and Engineering C*, 2014, 42, 289-294. Impact Factor: 3.42

Al-Ameen, M.A., Chakraborty, G. Sensitive quantification of vascular endothelial growth factor (VEGF) using porosity induced hydrogel microspheres. *Biosensors and Bioelectronics*, 2013, 49C, 105-110. Impact Factor: 7.47

Service: Professor Chakraborty is rated significantly capable in service. He has served on various department and college committees. He also has served on a university-level committee and has a good service record in his professional society, having chaired several conference sessions.

External Reviewers:

Reviewer A: "Dr. Chakraborty is rapidly emerging as a leader in his own right. … I have had many of his papers for review and have found them to be insightful concerning the problem at hand, with novel experimental design and execution. … More recently, his paper in *Biophysical Journal* in which he applied Raman spectroscopy to studying trehalose and water status in single cells is becoming a classic in the field."

Reviewer B: "Dr. Chakraborty's output is very good for his career stage. For instance, he has 18 publications with a similar number of presentations at meetings since 2012 (start of faculty job). He has several hundred citations, 4 invited presentations, 4 issued and 2 pending patents with active licensing discussions underway."

Reviewer C: "All of these technical publications are of high-quality and present novel/ innovative fabrication/characterization and/or device development. I note that four of them list Nilay as the corresponding author and paid careful attention to them. They are all well written and well executed studies whose primary scientific contribution is related to the use of raman spectroscopy analysis to understand biopreservation processes."

Reviewer D: "He has an excellent combination of an important biomedical need (biopreservation) and a unique technique (Raman microscopy and other high end microscopy) that provides unique mechanistic insights. … These are all outstanding publications that speak to the high level of Professor Chakraborty's work. Overall, the quality, quantity, focus and scholarly impact of his technical papers are excellent. I believe he is a leader in the biopreservation and spectroscopy field."

Reviewer E: "In reviewing the sample of journal articles you shared with me, I rate Dr. Chakraborty's research publications to be of high quality and contributing significantly to the field. His research evolution since earning his doctorate in 2008 has been excellent, and it is clear that he has been effective in leveraging the masters and undergraduate students of the University of Michigan-Dearborn to ensure the research productivity."

Reviewer F: "While this represents a notable publication record with a respectable rate of productivity, what is more impressive is the quality of work that these publications embody. Professor Chakraborty has published his results in journals that carry strong impact factors and are relevant to the field."

Summary of Recommendation:
Professor Chakraborty is an excellent researcher, as is evidenced by his funding and publication records. Professor Chakraborty is an outstanding teacher, and his teaching effectiveness ranks in the top 5% among the ME faculty by students' evaluation of his in-class teaching performance. He has developed and taught three new courses in bioengineering. His service to the department and the college is very good, and so is his service to his professional society. We are very pleased to recommend, with strong support of the College of Engineering and Computer Science Executive Committee, Nilay Chakraborty for promotion to associate professor of mechanical engineering, with tenure, Department of Mechanical Engineering, College of Engineering and Computer Science.

Anthony W. England, Dean
College of Engineering and Computer Science

Daniel Little, Chancellor
University of Michigan-Dearborn

May 2018