Approved by the Regents May 21, 2015

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

Daniel J. Coffield, Jr., assistant professor of mathematics, Department of Mathematics, College of Arts and Sciences, is recommended for promotion to associate professor of mathematics, with tenure, Department of Mathematics, College of Arts and Sciences.

Academic Degrees:

Ph.D.	2009	Oakland University, Rochester, Michigan
M.S.E.	2004	University of Michigan-Ann Arbor
B.S.	2003	University of Michigan-Ann Arbor

Professional Record:

2009-Present	Assistant Professor of Mathematics, University of Michigan-Flint
2009	Postdoctoral Research Associate, Oakland University
2005-2009	Graduate Teaching and Research Associate, Oakland University
2004-2005	Adjunct Professor of Mathematics, Great Lakes University, Auburn Hills, Michigan

Summary of Evaluation:

Teaching – As a teacher, Professor Coffield has demonstrated that he can effectively engage students (often math phobic) in developing an understanding of the content of mathematics. Professor Coffield teaches a variety of courses serving a wide range of constituencies. He often teaches MTH 120, an introductory service course whose students are generally not mathematically inclined. He also teaches lower-division calculus courses (MTH 121, 122), which serve beginning students from mathematics and all of the natural sciences, who might be labeled partially mathematical. With this range of students the teaching performance of Professor Coffield is consistently high. This evaluation is true from students, peer assessment, and reflections from prior students. In each of these venues, the description of teaching excellence is parallel in that they all view his teaching as truly engaging and helpful rather than prescriptive. Professor Coffield helps students comprehend mathematics in ways that they can internalize the content and become mathematically competent for their disciplinary homes.

Research – Professor Coffield has shifted his emphasis since completion of his doctorate from an analysis of fluid dynamics in fractured rock reserves to the study of epidemiology of major diseases in human populations. In both areas of concern, he has published in high quality journals. Most recently he has concentrated on two very significant topics, Chagas disease viewed through the lens of mathematical modeling, and Hepatitis C distribution in human populations. The use of mathematical modeling to examine human health issues is a relatively new area for Professor Coffield and in a short time he has established himself as a very promising scholar. The applied aspect of his scholarship is particularly important given the mission of the University of Michigan-Flint and the commitment to engaged scholarship. Students in allied science technology and mathematics (STEM) readily embrace the research contributions that Professor Coffield brings into the classroom as applied examples.

Recent and Significant Scholarly Activity:

Refereed Publications

Coffield, Daniel J., Cuttler, Ken, Qu, Xianggui, et al. (2014). "A Model for the Transmission of Chagas Disease with Random Inputs," *Biomath* 3, 1411071, http://dx.doi.org/10.1145/j.biomath.2014.11.071.

Coffield, Daniel J. and Spagnuolo, Anna M. (2014). "Steady State Stability Analysis of a Chagas Disease Model," *Biomath* 3, 1405261, pp. 1-13.

Coffield, D. J., Spagnuolo, A. M., Shillor, M., Mema, E., Pell, B., et al. (2013). "A Model for Chagas Disease With Oral and Congenital Transmission,"*PLoS ONE* 8(6): e67267, doi:10.1371/journal.pone.0067267.

Coffield, D. J., Rong, L., Guedj, J., Dahari, H., Levi, M., et al. (2013). "Analysis of Hepatitis C Virus Decline During Treatment With the Protease Inhibitor Danoprevir Using A Multiscale Model," *PLoS Computational Biology* 9(3): e1002959, doi:10.1371/journal.pcbi.1002959.

Coffield, Daniel J. and Spagnuolo, Anna M. (2010). "A Model For Single-Phase Flow in Layered Porous Media, *Journal of Differential Equations*, Vol. 2010, No. 94, pp. 1-19.

Work in Progress

Coffield, Daniel J., Spagnuolo, Anna, Shillor, Meir, et al. "Modeling Chagas Disease with Domestic and Peridomestic Triatoma Infestans in the Gran Chaco Region." *(Estimated Completion 2015)*

Talks and Presentations

"Mathematical Models of Chagas Disease," Michigan Academy of Science Arts and Letters Annual Conference, Holland, Michigan, March 2013.

"A Model for Chagas Disease with Vector Consumption and Transplacental Transmission," mini-symposium on Victor-borne Diseases, 8th European Conference on Mathematical and Theoretical Biology and Annual Meeting of the Society for Mathematical Biology, Krakow, Poland, June 2011.

"Modeling Chagas Disease," Department of Mathematics, University of Michigan-Flint, March 2011.

"Vibrio Cholerae Colonization Simulations via Discontinuous Galerkin Methods," Red Raider Mini-Symposium: Mathematical Modeling in Population Biology and Epidemiology, Texas Tech University, Lubbock, Texas, October 2010.

Research Funding

Coffield, Daniel J. (2010). "Numerical Simulations for *Vibrio Cholerae* Colonization of the Human Small Intestine," University of Michigan-Flint Research and Creative Activity Award, $7,150.

Service – Professor Coffield has been instrumental in maintaining the significant emphasis on service that is traditional in the Department of Mathematics at the University of Michigan-Flint. Professor Coffield has contributed heavily to the reinvigoration of Family Math Night. This program is a highlight of recruiting talented area school students to enjoy the field of mathematics along as have fun with the family. The advising performance of Professor Coffield is also viewed very positively by the department. He has also been involved in college-wide service through the Academic Standards Committee and participated effectively in the positive accreditation review of the School of Education and Human Services. Overall, Professor Coffield contributes a high quality of service to the College of Arts and Sciences and the University of Michigan-Flint.

External Reviewers:

Reviewer (A): "It is my general impression that solid scientific work is presented in all his publications with each one of them making substantial contribution to knowledge... The fact that the candidate

collaborates with top researchers and that he is accepted as a member of multidisciplinary teams is a testimony to the value of his contribution."

Reviewer (B): "To date, Dr. Coffield [sic] research portfolio is solid. He has a significant number of papers that have been steadily published over the 5 years since earning his PhD, with more in progress."

Reviewer (C): "His articles are interesting, and address important questions… One important and non-obvious conclusion of this article is that oral transmission in mammals is far more important route of transmission than congenital transmission. The article is published in PLoS One – one of the leading journals on theoretical biology."

Reviewer (D): "Both of the PLOS publications are very strong. There is a solid mix of math and biology. The mathematics used in both (age structured-PDE and Delay Differential Equations) are quite challenging but in my opinion required to move the field of math biology ahead. In both cases, the connection to the biology is done well."

Reviewer (E): "Not only is Dr. Coffield proficient in mathematics, he is also able to transition to the new research area of mathematical epidemiology without any problem."

Reviewer (F): "My overall impression of the quality of his contributions is that they are comparable to those of other workers of his (academic) age in mathematical biology: excellent results and understanding of the models are obtained from careful application of classical results from mathematics… These are good quality works that are also important for the development of scholarly connections between mathematics and the life sciences; such collaborations are difficult to establish and require a large investment of time and effort to develop."

Summary of Recommendation:

Professor Coffield has is an excellent teacher, accomplished scholar, and effective colleague. I fully concur with the Executive Committee of the College of Arts and Sciences and enthusiastically recommend that Daniel J. Coffield, Jr. be promoted to associate professor of mathematics, with tenure, Department of Mathematics, College of Arts and Sciences.

Recommended by:

Albert C. Price

Albert C. Price, Interim Dean
College of Arts and Sciences

Recommendation endorsed by:

Barbara B. Dixon

Barbara B. Dixon, Interim Provost and
Vice Chancellor for Academic Affairs

Susan E Borrego

Susan E. Borrego, Chancellor
University of Michigan-Flint

May 2015