

UTMOST application

John Perry

December 22, 2015

Course: I would like to apply to teach linear algebra in the UTMOST program in Fall 2017 and Fall 2018. I can teach it during Spring semesters if preferred, and can also teach a control section.

Teaching experience: I taught linear algebra in Fall 2005 with the Yaquib and Moore book published by Academic Press. I regularly teach Modern Algebra I and Modern Algebra II, both of which rely heavily on linear algebra, and I frequently revisit ideas of linear algebra, such as determinants, linear transformations, kernels. In a different class I use eigenvalues and eigenvectors to derive the closed form of the Fibonacci sequence. I am personally interested in seeing how this approach with linear algebra would affect student performance in Modern Algebra.

Software experience: I am the designated instructor for *Mathematical Computation*, a course whose goal is to introduce students to computer algebra systems and how to use them to explore mathematical ideas. We originally used Maple, but after a few years I switched to Sage. I use a series of lectures whose latest incarnation can be found at

www.math.usm.edu/perry/old_classes/mat305sp15

Sage experience: As noted above, one of my classes uses Sage extensively and exclusively. I occasionally pull Sage out for other classes. We will begin using SageMathCloud with Mathematical Computation I in the spring, so I should have a good deal of experience using SageMathCloud with a class at that time. I use Sage in my research and have contributed non-trivial code to Sage, so I am also familiar with development in Sage.

Institution: The University of Southern Mississippi is a public, comprehensive university located on two campuses, in Hattiesburg and Long Beach. Student population is roughly 15,000. The majority of the faculty are research-oriented. Student population for Linear Algebra tends to consist primarily of math majors; 22 enrolled for Fall 2015 (15 in Hattiesburg, 7 in Long Beach) and 26 have enrolled for Spring 2016 (17 in Hattiesburg, 9 in Long Beach). Our students are rather weak; while they perform somewhat better than “area schools” on the Major Field Test, they perform far below the national average. Much of this is due to preconceptions of what mathematics is, and this motivates my interest in approaches that shake up this view at appropriate places in the curriculum.



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Letter of support for J. Perry's participation in the UTMOST Project

Dear Colleagues:

The UTMOST project is targeting two crucial challenges the mathematical community faces and which I am strongly interested in. There is the classical challenge of transitioning from application of mathematics to mathematical reasoning, which is certainly present in Linear Algebra and Abstract Algebra, and which has existed as long as mathematics has been taught. Then there is the comparatively new challenge of integrating ever more powerful computational systems, such as SAGE, in a way that enhances learning. It is crucial that we meet these challenges in classes such as Linear Algebra or Abstract Algebra, so that students are well prepared to reason and use technology appropriately.

Dr. John Perry is interested in participating in the UTMOST project with our Linear Algebra course. Linear Algebra is offered every semester at The University of Southern Mississippi and scheduling Dr. Perry to teach it within the UTMOST time frame should not be a problem. I am aware that there will be data collection activities that will need to be cleared with the Institutional Review Board and I trust that Dr. Perry will be able to handle this process. Moreover, I will help Dr. Perry with the UTMOST activities as much as I can. It appears that UTMOST is planning to cover all participant expenses, but, should Dr. Perry need financial support beyond what UTMOST can provide, the department will provide what we can.

Sincerely,

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