

UTMOST Project Participation Application

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Course

(a) Linear Algebra

Our linear algebra class is a 3 quarter-credit class. The prerequisite is calculus II. We offer the class twice a year in the fall and spring quarter. It is possible for me to teach this class at least once during the 2017-2018 and 2018-2019 school year.

I would not be interested in teaching a control section as I am already using SageMath in my class and it has been working well (more info below).

(b) Experience teaching Linear Algebra

This fall quarter is the third time I teach this linear algebra course, and the first time I incorporate SageMath into the class. About half of the class meetings are inquiry/activities based. SageMath Cell server is used throughout these activities and are encouraged to use for appropriated homework problems.

Course webpage: <http://myhome.spu.edu/lauw/>

Follow the link on the left panel: Course Info → Fall 2015 → MAT2401

(c) Experience using Mathematical Software in Courses

We has been using Maple extensively in our math courses. The following are the courses that I have taught with the integration of Maple: Calculus I, II, III, Mathematical Modeling, Numerical Analysis.

Note that Maple (or other computing technologies) was not integrated into linear algebra the first two times I taught it. It is kind of the norm here at SPU.

(d) Experience with Sage and SageMathCloud

I had been thinking about learning SageMath ever since I attended William Stein's talk a few years back. Last summer, I started to rework my linear algebra class to include inquiry based activities. And I thought it would be a perfect time to try out SageMath. I find that SageMath Cell server fit in the best with the design of the activities. Currently my Sage proficiencies are mostly limit to the linear algebra related operations.

In addition, I suggested a SageMath related senior project for one of my advisees. She is working to use the interactive feature of SageMath to visually demonstrate the following calculus concepts: the mean value theorem (see <http://myhome.spu.edu/lauw/Sage/MVT.html>), the limit definition of derivatives, and the Riemann sum definition of the definite integrals.

The SPU math department is investigating the viability of switching from Maple to a possible cheaper/better computational software. I applied and was given an internal grant (a 5-credit course release, spring 2017) to implement SageMath in my numerical analysis course. As part of the project, I will create some online tutorials to help students to learn the basics of SageMath in algebra manipulations, graphing, and calculus related commands.

SPU

Seattle Pacific University is a private Christian university in Seattle, Washington with a wide range of undergraduate programs. Graduate programs are available in business, education, psychology, and theology. The combined student body is around 4000. It has some liberal arts traditions but has not been officially associated/labeled as liberal arts for some time.

Linear algebra is a required course for engineering, mathematics, physics, and is an elective for computer science, and chemistry.

Attached below is a support statement from our department chair Dr. O'Leary.

Thank you for considering my application.

Wai



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This letter is in support of Dr. Wai Lau's application to participate in the UTMOST Project. I am the Chair of the Department of Mathematics at Seattle Pacific University, where Dr. Lau is Associate Professor of Mathematics.

I understand that participation in this project requires that Dr. Lau teach Linear Algebra during the 2017-18 and 2018-19 academic years. Our department offers a 3 quarter credit Linear Algebra course twice in each academic year, during the autumn and spring quarters. Dr. Lau will be scheduled to teach Linear Algebra at least once during each of the two academic years in question. The class will be scheduled to be taught in a computer classroom so that he will have ready access to computing facilities during class sessions.

Sincerely,

Dr. Robbin Lerch O'Leary
Professor and Chair
Department of Mathematics
Seattle Pacific University

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