

UTMOST: Undergraduate Teaching of Mathematics with Open Software and Textbooks

Call for Participation

December 2015

The [UTMOST Project](#) investigates the affordances and challenges of integrating powerful open source software for advanced mathematics with textbooks and course materials provided with open licenses and available in a variety of formats. The project seeks to understand the ways in which these tools change instruction of undergraduate mathematics courses and the opportunities to learn that are created with these tools.

We are proposing a research project to the National Science Foundation's Improving Undergraduate STEM Education (IUSE) program and are soliciting the participation of faculty who teach undergraduate mathematics.

Activities

- Teach an undergraduate courses in linear algebra or abstract algebra using the open source textbooks *A First Course in Linear Algebra* and/or *Abstract Algebra: Theory and Applications*, during some or all of the 2017-18 and 2018-19 academic years.
- Make extensive use of the open source Sage system in your course. The textbooks contain abundant resources to assist with this. We will also have a few courses taught with the textbooks, but without incorporating Sage, as “control” sections for comparison.
- Make extensive use of SageMathCloud in your course.
- Participate in data collection, specifically: administer student surveys and tests of student knowledge; log course activities and take part in interviews; help with recruitment for student focus groups, and help secure some relevant student data. In addition we seek sections of these courses to conduct more intensive data collection on lesson planning and instruction via direct observation.
- Attend at least two Sage Edu Days Workshops in Seattle, mid-June, 2017, 2018, 2019.
- A final report will be required before payment of stipend.

Stipends and Benefits

- \$2,500 stipend for most participants, \$4,000 for a few sites with more extensive data collection, and \$1,000 for control sections.
- Automatic acceptance to Sage Edu Days Workshops with transportation and lodging fully-funded.
- SageMathCloud course subscriptions will be provided for each course. These provide tools for electronic collection, grading, and return of assignments. They also provide network access and member hosting on servers reserved for subscribers. The course functionality also provides powerful features for real-time collaboration between faculty and students.

- Each faculty member teaching a course will also be provided a personal Premium Plan subscription while involved with the project. These provide many project enhancements beyond the free accounts, such as 40 network upgrades, and 16 upgrades to member hosting, more memory, more disk storage, and longer time-out periods. All of these upgrades may be applied to projects owned by colleagues and collaborators who have free accounts. These subscriptions are worth \$499 per year.

Application

- Provide a short statement that describes
 - (a) which course(s) you could teach and exactly which semester(s) or quarter(s) each would be possible, including the possibility of control sections
 - (b) your experience teaching these courses
 - (c) your experience using mathematical software in courses (e.g., names of software systems and courses)
 - (d) your experience with Sage and SageMathCloud in particular.

Note that we are looking to have as wide a variety as possible of experience levels, so these are not meant to be viewed as qualifications.

- Also include in your statement a description of your college or university, and student population for the relevant courses. Public/private, small/large, 2-year/4-year, liberal arts/engineering/technical, etc. If your institution is listed on the US Department of Education list of [Accredited Postsecondary Minority Institutions](#), please make explicit mention of that. Again, we plan to have a wide variety of institutions, especially with regard to size.
- It will be possible, and in some cases desirable, to have several courses at the same institution, taught by the same individual faculty or by more than one faculty member. These can be combined into a single application.
- We are only able to use courses at US institutions.
- Provide a short letter on letterhead from your department chair (or similar head officer) stating that the department is aware of the program activities and requirements, and that every effort will be made to schedule the necessary courses at the stated times.
- Email your application as a single PDF attachment to Rob Beezer, beezer@pugetsound.edu, before December 24, 2015. Those accepted will be included in our proposal, but participation will be subject to funding of the proposal (decision expected Summer 2016).