

External Review Team Report

I. Introduction

Membership of Outside Committee

- Andrea Frazier, Associate Professor, Department of Educational Foundations, Columbus State University (Team Co-Chair)
- Brian Schwartz, Professor, Department of Biology, Columbus State University
- Martha Abell, Dean and Professor of Mathematics, College of Science and Mathematics, Georgia Southern University (Team Co-Chair)

Procedure Followed and Information Gathered: The External Review Team received the Self-Study Report from Tim Howard, Chair of the Department of Mathematics. The Team reviewed this document in advance of the site visit on Monday, March 21, 2016. The Team gathered more information through face-to-face meetings with the Department Chair, faculty members and students during the site visit.

II. Findings of the External Review Committee

(Include a brief narrative of the committee's findings in each area. Please include strengths as well as recommendations for each area as appropriate.)

a. Assessment of Program Quality (Satisfactory)

- Program and curriculum align well with Mathematical Association of America (MAA) recommendations in the CUPM Curriculum Guide - updated 2015
- 14 of 17 have terminal degrees; however, high reliance on part-time faculty
- Students interviewed identify the faculty as a strength of program
- Some faculty are excelling in publications/presentations
- Strong outreach component of departmental service
- A nice mix of faculty and student honors/awards

b. Recommendations for Improving Program Quality

- Determine areas in the curriculum that could be improved by considering the recommendations of the MAA Curriculum Guide, which are summarized in the Overview (pp. 9-14) at http://www.maa.org/sites/default/files/pdf/CUPM/pdf/CUPMguide_print.pdf
A more in depth analysis of the program can be considered by reviewing reports by the Course Area Study Groups and the Program Area Study Groups, which can be found online at http://www2.kenyon.edu/Depts/Math/schumacherc/public_html/Professional/CUPM/2015Guide/CUPMDraft.html
- Reduce the reliance on part-time faculty
- Facility Improvements needed to encourage higher levels of engagement through practices like collaborative learning, opportunities for student research, technology usage, etc.

c. Assessment of Program Productivity (Below Average but trending to Satisfactory)

- Despite the 5-year average <10, numbers are up in recent years.
- CSU has similar numbers as peer institutions in the USG
- The program usually meets or exceeds the campus retentions average. (Small numbers lead to greater volatility.)

d. Recommendations for Improving Program Productivity

- Hire additional faculty – This provides the department the ability to offer required courses more frequently to eliminate bottlenecks in degree progression; in addition, additional faculty allows more faculty in the department to become more involved in providing undergraduate research opportunities with their students, which has been shown at other institutions to recruit and retain majors.
- Hire additional student workers to serve as peer leaders in courses students find more challenging.

e. Assessment of Program Viability

- The Mathematics program offers options for students interested in a solid liberal arts background as well as for students seeking employment in education, government, or industry.
- The program is cost effective.

f. Recommendations for Improving Program Viability (Above Average)

- N/A

III. Final Recommendations of the Review Team

Faculty:

Request additional full-time faculty to support more frequent offerings of required courses, more student research, and reduced class sizes (2 Tenure-track faculty; 2 Lecturers).

Develop a workload policy that allows for reduced teaching loads in exchange for a higher level of research productivity.

Develop a recognition system that is couched within faculty understanding of incentives. Some incentives identified by faculty do not require additional resources (appreciation, recognition, balance in expectations), and the committee feels there are even more ideas outstanding. Faculty perception of being valued could serve as some buffer against disappointments for college and department level decisions that do not have full buy-in.

Pedagogical/Curricular/Program Redesign:

Consider reinstating courses in Abstract Algebra II (Math 5112) and Real Analysis II (Math 5152) to meet the CUPM Curriculum Guide Content Recommendation 7. Content Recommendation 7: *Mathematical sciences major programs should require the study of at least one mathematical area in depth, with a sequence of upper-level courses. - Mathematics grows through the construction of abstract theories from definitions, examples, and theorems. Students learn to cope with such complexity by grappling with clusters of related ideas, in depth and over an extended period. Every mathematics major student should encounter at least one area in depth, drawing on ideas and tools from previous courses and making connections among them. Departments can meet this goal by requiring either two related courses or a year-long sequence at the upper level. This goal prescribes neither a particular area of study nor whether the material be mainly theoretical or abstract; possibilities include Probability and Mathematical Statistics, Real Analysis I/II, and Abstract Algebra I/II.*

Consider incorporating more opportunities for students to use technology in the curriculum. This is based on the MAA Curriculum Guide as well as the need for technology skills for successful employment in business and industry. Cognitive Recommendation 3: *Students should learn to use technological tools. Mathematical sciences major programs should teach students to use technology effectively, both as a tool for solving problems and as an aid to exploring mathematical ideas. Use of technology should occur with increasing sophistication throughout a major curriculum*

Review the curriculum in comparison to the MAA Curriculum Guide. The Course Area Study Group reports and the Program Area Study Group reports included in the Curriculum Guide can be useful in determining recent trends in curriculum develop.

Review the curriculum across programs to determine the “big ideas” within a content area. Based on the process, structure individual course design around the big ideas rather than topics. This recommendation is couched within the understanding that students need repeated exposure to key ideas in different contexts to build the ability to transfer knowledge across domains. Likewise, a streamlined pedagogy could open the doorway for faculty to feel they can “play” in the introductory courses, allowing for high-impact practices that facilitate high levels of student engagement (e.g., collaboration, undergraduate research, enhanced technology usage) and learning for all students at all levels of engagement with math. Finally, math majors might begin to feel more attuned to developmental progression across their courses from the introductory to advanced levels.

Supportive Student Culture and Opportunities for Deep/Transformative Engagement:

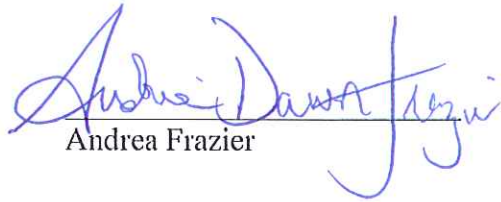
Provide a more nurturing environment for all students, especially pre-service math teachers.

Engage in professional development that encourages reflection on how to provide research opportunities in mathematics for students at all levels of engagement with the major. Based on professional development, build opportunities for research for students, making undergraduate research a regular feature for students at all levels of engagement with math.

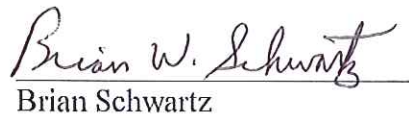
Keep abreast of the career and personal goals of math majors and continually build program, co-curricular, and pedagogy elements that facilitate students meeting their goals

Provide tutors for students in upper level or transition courses to help reduce the number of times students must repeat these courses.

Signature Page (Include signatures/dates of the review team here.)


Andrea Frazier

5/11/16
Date


Brian Schwartz

5-11-2016
Date


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April 21, 2016
Date