Mathematics and Statistics Program Review 2022-23

Closing MOU **Date: September 13, 2023**

Overview

Degree/Certificate Programs Reviewed:	Bachelor of Science Mathematics Bachelor of Art Mathematics Master of Science Mathematics Master of Science Statistics and Data Science Doctor of Philosophy Mathematics Doctor of Philosophy Statistics and Data Science
Department Chair & Dean:	Tin-Yau Tam, Chair; Louisa Hope-Weeks, Dean
External Reviewers & Affiliation:	Dr. Oliver Dasbach, Chair and Professor of Mathematics, Department of Mathematics, Louisiana State University Dr. Bo Li, Chair and Professor of Statistics, Department of Statistics, University of Illinois Urbana-Champaign Dr. Charles Moore, Chair and Professor of Mathematics, Department of Mathematics and Statistics, Washington State University
Date of External Visit:	March 29-31, 2023

Review Process Summary

The Mathematics program was scheduled for regular program review as mandated by the Board of Regents and University policy. A self-study document for the department and its programs was developed by the department faculty and completed in the Fall of 2022 for Mathematic and Statistics programs. These respective reports were provided to the reviewers before they conducted a visit on March 29-31, 2023. The external reviewers reviewed the program and met with relevant faculty, staff, students, alumni and administrators to determine the department's accomplishments, examine strengths and weaknesses, and identify opportunities as it plans for the future. A final report was issued by the review team shortly after the review visit. In accordance with institution practice, responses to the review were solicited from the department and the dean. A final meeting took place on August 30, 2023. This document represents the final MOU of recommendations and findings from the review.

Signatures

Executive Vice President & Provost:	Jeffrey S. Thompson	Date:	9/26/2023
Vice Provost, Undergraduate Education:	David Shintani	Date:	9/18/23
Vice Provost, Graduate Education & Dean, Graduate School	DocuSigned by: 471BABFE13064E0... Markus Kemmelmeier	Date:	15-Sep-2023 | 3:37 PM PDT
Dean, College of Science	DocuSigned by: AEEF67B34D86486... Louisa Hope-Weeks	Date:	15-Sep-2023 | 12:14 PM PDT
Chair, Department of Mathematics & Statistics Department	Tin-Yau Tam	Date:	09/15/2023

Major Findings and Conclusions

The number of graduating math and statistics majors per year is steadily increasing, reflecting a growing interest of students and a commitment of the department. Moreover, this trend is not limited to math majors alone, as an increasing number of students are also choosing to declare a minor in Mathematics and Statistics.

The Ph.D. and M.S. programs in Statistics and Data Science, established in 2017 and 2019 respectively, initially saw an increase of the numbers of students in each program, but for the last few years these numbers have leveled off. In Fall 2022, there were 15 students in the Ph.D. program in Statistics and Data Science, and 17 in the M.S. program. The Ph.D. program in Mathematics, launched in 2017 has grown steadily, with 17 graduate students enrolled in Fall 2022.

Though the committee had an overall favorable view of the program there were still areas for improvement identified.

- When compared to math or math & statistics departments at peer universities of similar size, the graduate programs in Mathematics and Statistics are insufficiently sized to adequately meet the growing teaching and research demands of the university. Currently, the department has 30 state funded graduate assistantships. We understand that this number will increase to 35 starting next fall. We recommend to further increase the number of state funded graduate assistantships. This will not only contribute to the success rate in math and statistics classes by lowering class sizes and providing teaching assistants to instructors of large sections, but the additional Ph.D. students will also make a positive impact on the research output of the department.

- While the departmental website is clear and informative, enhancing recruitment efforts could be achieved by incorporating a section showcasing sample alumni and their inspiring career paths. This addition would be beneficial for undergraduate and for graduate recruitment.

- The department should intensify its efforts to reach out to international math and statistics programs for the recruitment of graduate students. Several faculty members in the department have strong connections to these programs in other countries, and this advantage can be leveraged to increase the pool of graduate applications and further enhance the quality of students.

- Faculty expressed a strong desire for the ALEKS score to play a more prominent and influential role in determining the placement of incoming students into gateway math courses.

- Currently, the department lacks a comprehensive system for tracking the placements of its graduating majors and Ph.D. and M.S. alumni. We recommend that the department implements a systematic data collection process to gather this information, which can be immensely beneficial for various purposes such as grant applications, departmental reports, and reviews. The department can also make use of social media (Facebook, LinkedIn, Instagram) to remain connected with graduates well into the future. Work with advancement office and career studio to track placement of graduating majors.

- The department has 23 tenure-line faculty, including only two assistant professors. Two searches for Assistant Professorships are ongoing. In comparison to similar departments around the country, this is a low number and negatively impacts the department's research competitiveness and its ability to offer a broad range of upper-level and graduate-level courses. We recommend increasing the tenure-line faculty size.

- Teaching faculty need smaller class sizes and more grading support. As noted above, increasing the number of graduate teaching assistants will decrease class sizes, but adding teaching faculty would create a larger set of permanent instructors, further increasing course success rates.

- A considerable portion of teaching is covered on an ad-hoc level by Letter of Appointments (temporary instructorships). This negatively impacts the course experience of incoming students at the university, and the institutional memory of instruction. We recommend converting parts of the LOA budget – based on long term budget numbers - into non-tenure line faculty positions.

- It is common for Math and Statistics departments to generate additional funds through revenue sharing programs with the university. One effective approach is to offer additional opportunities for generating revenue, such as through teaching Dual Enrollment sections or classes for online programs, and scaling these opportunities based on enrollment or number of sections taught. This not only provides the department with much-needed resources, but also serves as an incentive to expand their offerings beyond their core mission. By embracing these revenue- sharing programs, the math and statistics department can continue to thrive and provide top- quality education to their students.

- The reviewers strongly recommend that the university proactively supports the department in gradually reducing the teaching load to a more balanced 2:1 teaching load for research-active faculty.

- The department could benefit from communicating and engaging more with alumni.

Next Steps for this Program/Department (topics will vary)

- We recognize the importance of the departmental website as a tool for marketing our degree programs to students and to faculty advisors and family members who might be advising prospective recruits to our graduate program. We plan to (continue to) work on improving our website in the manner suggested.
- We agree that improving our graduate recruiting is a top priority.
- We will work with and advise upper administration to develop admissions and placement policies.
- In general, we plan to continue to look for ways to improve our graduate offerings.
- We are going to work with career studio and the alumni association to track and engage alumni.
- The Department agrees that replacing much of our LOA-funded instructional staff by permanent instructors would improve the course experience of incoming students, facilitate mentoring the instructors, and increase institutional memory of instruction, as well as strengthening the Department in other ways. Overall, we hope that the Department is able to secure additional resources to enhance the Department's teaching and research missions.
- The department will review faculty teaching loads with the intent of becoming closer aligned to aspirant and peer R1 universities.
- The Department will work with appropriate offices to engage alumni.

Vital Statistics on NSHE Reports

Number of students with declared major in the program area:

2022-2023	BS Mathematics	193
	BA Mathematics	33
	MS Mathematics	19
	MS Statistics and Data Science	22
	PhD Mathematics	10
	PhD Statistics and Data Science	18

Number of graduates from the program for the following years:

2020-2021	BS Mathematics	44
	BA Mathematics	4
	MS Mathematics	4
	MS Statistics and Data Science	5
	PhD Mathematics	0
	PhD Statistics and Data Science	1

2021-2022	BS Mathematics	43
	BA Mathematics	8
	MS Mathematics	5
	MS Statistics and Data Science	9
	PhD Mathematics	0
	PhD Statistics and Data Science	3
2022-2023	BS Mathematics -	35
	BA Mathematics -	5
	MS Mathematics -	2
	MS Statistics and Data Science -	0
	PhD Mathematics -	2
	PhD Statistics and Data Science -	8

Program-level graduation rate using first-time, full-time, degree-seeking cohort at 150 percent completion time:

2020-2021	BS Mathematics	38%	n = 13
	BA Mathematics	50%	n = 2
	MS Mathematics	100%	n = 3
	MS Statistics and Data Science	N/A	
	PhD Mathematics	N/A	
	PhD Statistics and Data Science	N/A	
2021-2022	BS Mathematics	55%	n = 22
	BA Mathematics	0%	n = 3
	MS Mathematics	8%	n = 16
	MS Statistics and Data Science	N/A	
	PhD Mathematics	N/A	
	PhD Statistics and Data Science	N/A	
2022-2023	BS Mathematics	56%	n = 18
	BA Mathematics	33%	n = 3
	MS Mathematics	50%	n = 2
	MS Statistics and Data Science	100%	n = 4
	PhD Mathematics	N/A	
	PhD Statistics and Data Science	N/A	

Headcount of students enrolled in any course related to the program (duplicated):

2022-2023	BS Mathematics	18,406
	BA Mathematics	18,406
	MS Mathematics	325
	MS Statistics and Data Science	325
	PhD Mathematics	325
	PhD Statistics and Data Science	325