



**SOUTH DAKOTA BOARD OF REGENTS**  
**ACADEMIC AFFAIRS FORMS**

**Institutional Program Review**  
**Report to the Board of Regents**

Use this form to submit a program review report to the system Chief Academic Officer. Complete this form for all units/programs undergoing an accreditation review, nationally recognized review process, or institutional program review. The report is due 30 days following receipt of the external and internal review reports.

<b>UNIVERSITY:</b>	USD
<b>DEPARTMENT OR SCHOOL:</b>	College of Arts and Sciences
<b>PROGRAM REVIEWED:</b>	Department of Mathematical Sciences
<b>DATE OF REVIEW:</b>	6/21/2021
<b>TYPE OF REVIEW:</b>	Institutional Program Review

**University Approval**

*To the Board of Regents and the Executive Director: I certify that I have read this report, that I believe it to be accurate, and that it has been evaluated and approved as provided by university policy.*

  
\_\_\_\_\_  
President of the University

8/30/2021

\_\_\_\_\_  
Date

**1. Identify the program reviewers and any external accrediting body:**

Dr. Katherine Kime, Professor and Chair  
Department of Mathematics and Statistics  
University of Nebraska Kearney

Mathematics has no external accrediting body.

**2. Items A & B should address the following issues: mission centrality, program quality, cost, program productivity, plans for the future, and assessment of progress.**

**2(A). Describe the strengths and weaknesses identified by the reviewers**

The review recognized the department is part of a flagship university with a broad educational and scholarly commitment and commented that the department expresses this beautifully in its mission statement. The review commented that the department is maintaining high academic quality and rigor in its B.S., B.S.Ed., M.A. and M.S. programs citing that our graduates are finding good jobs or further educational opportunities. The review stated that the department is maintaining the intellectual focus of a flagship, rather than emphasis on career preparation (more the focus of land-grants)

or on extra-curricular activities (a current trend in colleges and regional universities). Further, it mentioned that the department is very active in research, and its contributions exhibit open inquiry and ideas generated intrinsically by the subjects of mathematics and statistics. The review did comment that in comparison to other flagship universities, that our ratio of tenure track faculty to instructors was quite different. The review also found some variations on the bachelor's degree and made suggestions for consideration as we look at ways to increase enrollments in the major.

#### A. Teaching and Curriculum

In summary the report mentioned that the department monitors what the requirements for bachelor's degrees are at comparable institutions and the Mathematical Association of America (MAA). It did however address some concerns about the BSED vs the BS in math with education certification and the need for more clarity.

#### B. Research

The report recognized there are six teaching assistantships and only one research assistantship available for graduate students, and no Ph.D. program. That the department is able to carry out the amount of research that it does with the graduate program it has was extremely impressive. The report recommended the two-course per semester teaching load be maintained.

#### C. Service and Outreach

The report mentioned that service activities were broad and indicate a wide range of talents among faculty members, as well as a sincere interest in the success of society.

#### D. Enrollments, Graduates, Resulting Employment

In comparing 2015 to 2019, the report mentioned the increase in both the number of B.S. and B.S. Ed. degrees awarded, but that the department has been paying attention to the fact that over those years, the number of majors has been decreasing. As to the jobs graduates are getting upon graduation the report mentioned this as a very successful record and indicated that the department's graduates are of high quality.

## **2(B). Briefly summarize the review recommendations**

### Section III. Recommendations from the report

#### A. Bachelor's and Master's degrees

1) Consider a 4 plus program, such as Delaware and Maine, in which students earn a bachelor's and master's. 2) With care, consider an option(s) in the B.S. A high number of options, such as Delaware, Montana and Nebraska have but it runs the risk of over-specialization at the undergraduate level and dilution of the core. But perhaps three options, with the third in addition to Math and Math Ed such as Iowa has, would be beneficial. Consider interesting dual majors, such as Wyoming has with philosophy and modern language. These could also be minors. An emphasis on reading and writing in the humanities could make a math major have a special attraction in various employment sectors and would be in the broader spirit of the flagship. 3) Make some alterations to the website. If alumni are willing, present short stories about their employment—this is a strength of the department. Include some pictures and/or videos of faculty, and of students making presentations, with a Powerpoint slide or two. 4) Clarify the distinction between the B.S. with certificate and the B.S. Ed. The scholarship page is excellent.

B. Create two new tenure/tenure track faculty lines, to increase impact as a flagship. Areas such as Geometry (in all its manifestations), Real and Complex Analysis, Number

Theory, and Algebra are suggested, or any field more in the direction of pure mathematics. Maine has several number theorists, in a small department.

C. Create at least three new R.A.s for graduate students

D. Maintain all the things indicated positively in Section 2. Especially 1) Proctoring exams for emporium or online classes in the testing center. 2) The two-course per semester load for tenured/tenure track faculty. 3) A quality B.S.Ed. which maintains emphasis on mathematics. 4) Presentations at AMS and MAA meetings for visibility. 5) Engagement with the broad array of organizations external to the department.

**2(C). Indicate the present and continuous actions to be taken by the college or department to address the issues raised by the review. What outcomes are anticipated as a result of these actions?**

Below we address each of the recommendations from the review.

A. Bachelor's and Master's degrees

1) Consider a 4 plus program, such as Delaware and Maine, in which students earn a bachelor's and master's.

- With many students entering college with a lot of credit already obtained, we do stress to them that they can graduate in 3 years and begin a Master's Degree. However it is agreed that it makes sense to formalize this with the proper paperwork.

2) With care, consider an option(s) in the B.S. A high number of options, such as Delaware, Montana and Nebraska have, runs the risk of over-specialization at the undergraduate level and dilution of the core. But perhaps three options, with the third in addition to Math and Math Ed such as Iowa has, would be beneficial.

- Currently we see our tracks as education, graduate school, and the business world where we recently approved a certificate in actuary sciences and we are currently working on one in data analytics. Beyond this, we need to get more majors before considering additional programs.

3) Consider interesting dual majors, such as Wyoming has with philosophy and modern language. These could also be minors. An emphasis on reading and writing in the humanities could make a math major have a special attraction in various employment sectors and would be in the broader spirit of the flagship.

- The College of Arts and Sciences makes it easy to double major and get a minor in these others. However, we should consider a more serious marketing strategy on any of these if they make sense. Department conversations this coming year will focus on these alternative options.

4) Make some alterations to the website. If alumni are willing, present short stories about their employment—this is a strength of the department. Include some pictures and/or videos of faculty, and of students making presentations, with a Powerpoint slide or two. Clarify the distinction between the B.S. with certificate and the B.S. Ed. The scholarship page is excellent.

- The university is currently engaged in updating the website and I provided them with alumni names for just such purposes. It is noted about the constant tension between BS math-education vs BSED, especially with a RCM budget model. We will consider ways we can make things more clear on the webpage as the new one is developed.

B. Create two new tenure/tenure track faculty lines, to increase impact as a flagship. Areas such as Geometry (in all its manifestations), Real and Complex Analysis, Number Theory, and Algebra are suggested, or any field more in the direction of pure mathematics. Maine has several number theorists, in a small department.

-Given we have a hard time making 4-7-10 in our current classes with the decreasing majors, I only see 2 viable options to accomplish this, both of which will have financial implications to the College.  
1) As an instructor leaves or retires, we replace the position with 2 tenure track lines (to maintain the 2 course teaching load) and the teaching duties will dip into those traditionally taught by instructors. Possible courses here would be pre-calculus or survey of calculus. 2) Some departments have added tenure track lines where the positions in the long run were to be funded by external funding. Given we don't have a PhD program with a lot of grad students to assist in the research, this may seem like we are setting someone up for failure.

C. Create at least three new R.A.s for graduate students

-This would definitely bolster research opportunities for our graduate students and help our faculty with their research agendas as well. It could assist with option 2) above in hiring additional tenure track positions but I see no way around the fact that this will have financial obligations to the College.

D. Maintain all the things indicated positively in Section 2, especially proctoring exams for emporium or online classes in the testing center, maintain the two-course per semester load for tenured/tenure track faculty, a quality B.S.Ed. which maintains emphasis on mathematics, presentations at AMS and MAA meetings for visibility, engagement with the broad array of organizations external to the department.

- The department has a solid commitment to maintaining these valued goals and deep-seated traditions.