

**Southwest Minnesota State University
2013 Mathematics Program Review Report
by the External Consultant**

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Education:

<u>Degree</u>	<u>Year</u>	<u>Institution</u>
B.A. (Math & Physics)	1960	University of Wisconsin, River Falls
Ph.D. (Mathematics)	1966	University of Minnesota

Professional Experience:

Professor	1976-2012	University of Nebraska-Lincoln
Chair of Department	1975-1983	University of Nebraska-Lincoln
Visiting Associate Professor	1974-1975	University of Minnesota
Associate Professor	1971-1976	University of Nebraska-Lincoln
Assistant Professor	1966-1971	University of Nebraska-Lincoln
Teaching Assistant	1960-1966	University of Minnesota

Research Interests:

Integration in Function Space, Wiener and Feynman Integrals

1. The dates of my review were March 28 and March 29 of 2013. I arrived in Marshall at 4:00 PM on Wednesday, March 27th and left Marshall at 8:00 AM on Saturday, March 30th. I met with various people from SMSU almost continuously from 8:00 AM until 8:00 PM on both Thursday and Friday.
2. The last 5-year review document was not available for me (or the mathematics department at SMSU) to read and study because the external consultant hired at that time never turned in a report. This was very unfortunate because having his report would have given me and the department a baseline to measure changes from. But on the positive side, this external report should be available several years from now for the next external program review.
3. The College Now Program at SMSU is a program whereby high school students can earn college credit by taking college level algebra and/or college level calculus classes at their high school from carefully chosen high school teachers under the supervision of a mathematics faculty member from SMSU. College Now is a university wide program. Mathematics and English are the two largest participants but many other university programs also participate including Chemistry, Spanish, Psychology and Speech. At the present time, the SMSU faculty member involved meets with the various high school teachers which is quite a time consuming task. I think that by using tools like SKYPE

one could reduce considerably the total amount of travel needed to monitor this program. I understand that this program generates a lot of tuition income for SMSU; which is then used to fund many other desirable projects and programs at SMSU.

4. The Mathematics Department offers a major in mathematics that can be taken as a Bachelor of Arts degree, a major in mathematics education that can be taken as a Bachelor of Science degree, and a minor in mathematics. The mathematics majors and minor consist of the following courses:

Mathematics Major (BA)

Required Courses in mathematics (29 credits)

MATH 150 Calculus I.....	5 cr
MATH 151 Calculus II	5 cr
MATH 200 Intro to Statistics	3 cr
MATH 252 Calculus III	3 cr
MATH 320 Foundations of Mathematics	3 cr
MATH 325 Combinatorics	3 cr
MATH 350 Differential Equations	3 cr
MATH 360 Linear Algebra	3 cr
MATH 480 Mathematics Seminar	1 cr

Mathematics Electives (15 credits)

MATH 4XX MATH courses numbered 400 or above.....	9 cr
MATH 3XX MATH courses numbered 300 or above.....	6 cr

Additional Courses (3 credits)

ENG 360 Scientific and Technical Writing.....	3 cr
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Total credits 47 (31 credits at 300 level or above)

Mathematics Education Major (BS)

Required Courses in Mathematics (29 credits)

MATH 150 Calculus I	5 cr
MATH 151 Calculus II.....	5 cr
MATH 200 Intro to Statistics.....	3 cr
MATH 252 Calculus III.....	3 cr
MATH 300 Geometry.....	3 cr
MATH 320 Foundations of Mathematics.....	3 cr
MATH 325 Combinatorics.....	3 cr
MATH 350 Differential Equations.....	3 cr
MATH 360 Linear Algebra.....	3 cr
MATH 480 Mathematics Seminar.....	1 cr

Mathematics Electives (12 credits)

MATH 4XX MATH courses numbered 400 or above.....9 cr
MATH 3XX MATH courses numbered 300 or above.....3 cr

Total credits 44 (28 credits at 300 level or above)

Mathematics Minor (Non-Teaching)

Required Courses in Mathematics (16 credits)

MATH 150 Calculus I.....5 cr
MATH 151 Calculus II.....5 cr
MATH 252 Calculus III.....3 cr
MATH 320 Foundations of Mathematics.....3 cr

Additional Courses (6 credits)

MATH 2XX MATH courses numbered 200 or above.....6 cr

Total credits 22 (3-9 credits at 300 level or above)

Elective courses offered in recent years include:

MATH 486 Topology, MATH 440 Abstract Algebra, MATH 450 Advanced Calculus, MATH 430 Probability and Statistics

5. In this section I make several comments about Section 4 above.
- i. The number of credit hours required (as well as the courses required) for the Majors and Minors listed above are very similar to our requirements here at UNL as well as at other institutions with which I am familiar.
 - ii. The fact that many of the students at SWMU who major in Computer Science decide to take a non-teaching minor in mathematics including from three to nine credit hours at the 300 level or above, boosts the enrollments in these classes, and thus allows them to be offered on a regular schedule.
 - iii. At many colleges and universities (including UNL) the mathematics department generates a lot of credit hours (and thus tuition income) by teaching college algebra and other service courses needed by various disciplines in relatively large classes and as a reward are often allowed to teach advanced math classes for their majors with rather low enrollments. While chair at UNL, I recall that from time we would let a 2-semester advanced class run with only 2 or 3 students enrolled because this class was essential to these students' program of study.

6. The students at SMSU are very fortunate to have a Math Lab that is open more than 60 hours each week where they can just “drop in” and get help. The coordinator of the Math Lab, John Ward (a very knowledgeable mathematician) is in the lab about 20 hours each week and the rest of the time it is staffed by bright students majoring in mathematics and/or computer science. I expect that some of these student helpers discover that they enjoy explaining math to others and pursue graduate work in mathematics as a result.
7. In meetings with chairs and faculty members from other departments I got the impression that they feel that the mathematics department is sensitive to their needs and is very open to working together with them to find solutions to problems as they arise.
8. At noon on Thursday I met with a group of 12 students for about 1 hour. I had them sign a sheet giving me their names and their major. 5 of these students were computer science majors and math minors while the other 7 were math majors. Then on Friday afternoon I met individually with 5 students; 3 who weren't able to attend the Thursday noon meeting and 2 who were at the Thursday noon meeting but wanted to talk with me one-on-one.
 - i. One concern several students expressed was the fact that each upper-level course was only offered once every two years and so if they needed to drop a course, or if they got a bad grade in a course, they had to wait two years until they could take it again. Another concern was that a given course was usually taught by the same instructor while they would prefer a fresh start with a different instructor. These of course are very hard things to change in a small department.
 - ii. Three or four of them were quite uptight about how they were doing in their current upper-level mathematics courses because their average on work completed to date was between 70 and 80 percent. I tried to assure them (quite unsuccessfully I think) that this was not at all unusual in classes of this type. I should have advised them to talk with their instructor about their concerns.
9. I think that the current classrooms and faculty offices are fine. Also Monica Miller has her desk in a very accessible and noticeable position in order to answer questions that students, students visiting with their parents, other visitors, etc. may have. In particular it allows her to direct them to the best person available at a given time concerning questions and/or problems. It also makes it easier for her to remind the staff about various deadlines and meetings.
10. It was quite informative to talk with Gary Gillin in the admissions office. The admissions office is working hard on finding new and creative methods to convince more (and better) students to attend SMSU. It turns out that SMSU has a larger percentage of students who are the first member of their family to attend college than other colleges in the region; that is to say lots of students at SMSU are from blue-collar families. This is something for the mathematics department to keep in mind when recruiting students.
11. I had a 30 minute meeting with each faculty member in the department. At these meetings several different topics were discussed and various opinions about them were

given. Based partly on these discussions here are some items, topics and suggestions for the department to consider at future meetings.

- i. Is the math department too involved in the “College Now Program?” If so, can the department figure out ways to carry out this program more efficiently?
- ii. I think that Math 135, Precalculus should be offered every semester. Since probably only one section of it will be offered each semester, it is important to select “a time of day” that best fits the students’ schedules.
- iii. I find it interesting, as you point out in your self study, that 40% of your math majors start their study of mathematics at SMSU in a course below Math 150, Calculus I. This of course is partly due to the fact that lots of these students are from blue-collar families whose parents didn’t push them to take a lot of math in high school.
- iv. As you know, “Math Biology” is a very hot area these days. But students trained in mathematics and/or computer science are very well equipped to make significant contributions to this area and to related areas. Thus this is another thing for the mathematics department to keep their eye on as time goes by.