

**Minnesota State University Moorhead**  
**2007-2008 Assessment Report Cover Sheet**

(An electronic version of this form can be accessed at <http://www.mnstate.edu/assess>)

*Note: All non-accredited programs are required to complete this form. Include Assessment Reporting Forms for each learning outcome assessed.*

**Academic Program: B.A.'s and B.S.'s in Mathematics**

**Department: Mathematics**

**College: Social and Natural Sciences**

**Date: October 15, 2007**

**1. Name(s) of Department Assessment Coordinator and/or Assessment Committee Members**

**Ellen Hill (department assessment committee chair)**

**2. List of All Student Learning Outcomes.** (List all outcomes, placing an asterisk (\*) by the outcomes you are assessing this year.)

- \*1. Students should understand the theory and applications of calculus and linear algebra.
- \*2. Students should develop the capacity for rigorous analytical thought and the ability to communicate ideas in a precise manner.
- \*3. Students should possess an awareness of the abstract nature of theoretical mathematics and the ability to write proofs.
- \*4. Students should possess an understanding of the breadth of the mathematical sciences and their deep interconnecting principles.
- \*5. Students should be able to solve multi-step problems and perform complex tasks.
- \*6. Students should develop the ability to detect basic mathematical structures (patterns) and make generalizations from them.

**3. Describe how your program has addressed the comments from the Student Learning Outcomes Assessment Committee during the past two academic years?** (If you have made changes to your plan, file a revised Assessment Plan Cover Sheet and Assessment Planning Form(s).)

The SLOAC suggested that we change the scale for our capstone surveys to reduce the choices and improve inter-rater reliability. We agreed that such a change would help and adjusted the scale to be 1-5 rather than 1-9. On the new scale, 1 is 'very poor', 3 is 'adequate' and 5 is 'excellent'.

It was also suggested that a numerical goal should be set for the capstone surveys and for the ETS Major Field exam. We discussed this, and decided against doing so. For the ETS Major

Field exam, we have always paid more attention to the trends over the years rather than raw scores. Where are we getting better? If there's a reason for that, keep doing it. Where are we getting worse? Try to find some way to correct the appropriate issues that will not negatively affect those areas where we are either improving or staying the same. We feel that paying attention to the trends is more feasible. With it, our attention is focused on those areas needing the most improvement, rather than spread among several different categories. For the capstone surveys, we have the same issues, but also feel that a stated goal for the averages would influence the scores themselves, and thereby reduce their usefulness. Again, looking at trends is more useful to us.

**4. If you have received an Instructional Improvement Grant in the past two years, identify the outcomes on which the grant was based and provide a summary here of the results from your grant.**

We received an Instructional Improvement Grant in 2007. The grant was intended to primarily focus on the first of our student learning outcomes in regards to calculus. The main purpose of the project is to start to develop the labs for use in Calculus I and Calculus II. The idea was to start developing the labs during the summer and continue during the fall and spring semesters as Calculus I and Calculus II are taught. Most of the labs for Calculus I have been created, with a few left to develop as we progress through the fall semester. The Calculus II labs will be developed for use in Spring semester. It is too early to report on the results of using the labs since the fall semester is only halfway over and the labs for Calculus II are not intended to be instituted until the spring. We also note that the students in the newly redesigned calculus classes will not take the ETS Major Field Exam until their senior year, likely in December 2011.

**5. Signatures**

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Department Chair or Program Director

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Dean or Director

**Required Attachments:**

1. Assessment Reporting Forms
2. Records of department meetings when Assessment Report was discussed and approved.

**Minnesota State University Moorhead**  
**2007-2008 Assessment Reporting Form**

(An electronic version of this form can be accessed at <http://www.mnstate.edu/assess>)

*Instructions: Include this form for each student learning outcome assessed during the previous year. Include Assessment Report Cover Sheet.*

**Academic Program: B.A.'s and B.S.'s in Mathematics**

**1. Learning outcome assessed (please include the number of the outcome to correspond with the list on the cover sheet).**

1. Students should understand the theory and applications of calculus and linear algebra.

**2. Describe assessment measure used for this learning outcome (attach instrument or rubric)**

ETS Major Field Test in Mathematics.  
Success on the Society of Actuaries Exam I.

**3. Expected/satisfactory student results (from assessment plan)**

None is prescribed. We study the results for trends and react accordingly.

**4. Actual results from the past year (attach additional information, if necessary)**

In comparison to the institutions taking the Major Field Test in Mathematics, our students were at the 15<sup>th</sup> percentile in the “Calculus” subscore. For the “Algebra” subscore, which includes both linear algebra and abstract algebra, our students were at the 50<sup>th</sup> percentile. In the previous two years, the “Calculus” subscores were at the 15<sup>th</sup> and 20<sup>th</sup> percentiles. The “Algebra” subscores were at the 55<sup>th</sup> and 20<sup>th</sup> percentiles. Due to small numbers, some variability is expected. We note that our scores seem to be staying about the same. Starting with the students who take Calculus I in Fall 2007 or later, we have redesigned the first year calculus sequence in an attempt to improve the “Calculus” scores, but do not expect to see any results from this redesign until those students take the ETS exam in their senior year, likely Fall 2010. We are not particularly happy with the “Algebra” subscores either, but feel that our efforts for improvement should be spent on the weaker category at this moment.

Of the five students who took the actuarial exam in the last year, three passed, one did not, and one score is unknown.

**5. Describe and explain available trend data for student performance on this outcome over the past several years. In other words, describe how the results of this measure have changed over the past several years.**

See above for the ETS exam. In the previous year, three out of four students who attempted the Society of Actuaries Exam I passed the exam.

**6. Proposed action in response to results.** (Please note if improvements can be made with existing department resources. If improvements cannot be made with existing department resources, consider applying for an Instructional Improvement Grant.)

The department has already redesigned the first year calculus sequence to address the issues with calculus. The course was changed from four days a week lectures to three days a week lectures and two days a week lab time. The labs were developed with the help of an Instructional Improvement Grant.

**Minnesota State University Moorhead**  
**2007-2008 Assessment Reporting Form**

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*Instructions: Include this form for each student learning outcome assessed during the previous year. Include Assessment Report Cover Sheet.*

**Academic Program: B.A.'s and B.S.'s in Mathematics**

**1. Learning outcome assessed (please include the number of the outcome to correspond with the list on the cover sheet).**

2. Students should develop the capacity for rigorous analytical thought and the ability to communicate ideas in a precise manner.

**2. Describe assessment measure used for this learning outcome (attach instrument or rubric)**

ETS Major Field Test in Mathematics.  
Survey in capstone courses.  
Success on the Society of Actuaries Exam I.

**3. Expected/satisfactory student results (from assessment plan)**

None is prescribed. We study the results for trends and react accordingly.

**4. Actual results from the past year (attach additional information, if necessary)**

In comparison to the other institutions taking the Major Field Test in Mathematics, our students were at the 20<sup>th</sup> percentile last year in the “Non-Routine Problems” subscore. In the previous two years they scores at the 10<sup>th</sup> percentile.

For the questions on the capstone surveys, the students are ranked on a scale of 1 to 5 where 1 is “very poor”, 3 is “adequate”, and 5 is “excellent.” For the question regarding rigorous analytical thought, the students were given a mean score of 3.91. The scores in the previous two years, which were on a scale of 1 to 9, were 5.96 and 6.76. The scores look to be either even or increasing slightly. For the question regarding the communication of ideas in a precise manner, the students were given a mean score of 3.91. The scores in the previous two years were 6.20 and 6.74. Again, the scores appear to be either even or increasing slightly.

Of the five students who took the actuarial exam in the last year, three passed, one did not, and one score is unknown. In the previous year, three out of four students who attempted the Society of Actuaries Exam I passed the exam.

**5. Describe and explain available trend data for student performance on this outcome over the past several years. In other words, describe how the results of this measure have changed over the past several years.**

See above for the ETS exam and capstone surveys. In the previous year, three out of four students who attempted the Society of Actuaries Exam I passed the exam.

**6. Proposed action in response to results.** (Please note if improvements can be made with existing department resources. If improvements cannot be made with existing department resources, consider applying for an Instructional Improvement Grant.)

Although there are still issues to resolve, we are considering the feasibility of making Math 225 (Discrete Mathematics), in a modified form, a required course for our majors. It would provide our students with an introduction to proofs and be our gateway course for our abstract classes. The ability to do mathematical proofs is directly relevant to both rigorous thought about mathematical ideas and the ability to communicate ideas in a precise manner.

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**2007-2008 Assessment Reporting Form**

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*Instructions: Include this form for each student learning outcome assessed during the previous year. Include Assessment Report Cover Sheet.*

**Academic Program: B.A.'s and B.S.'s in Mathematics**

**1. Learning outcome assessed (please include the number of the outcome to correspond with the list on the cover sheet).**

3. Students should possess an awareness of the abstract nature of theoretical mathematics and the ability to write proofs.

**2. Describe assessment measure used for this learning outcome (attach instrument or rubric)**

Survey in capstone courses.

**3. Expected/satisfactory student results (from assessment plan)**

None is prescribed. We study the results for trends and react accordingly.

**4. Actual results from the past year (attach additional information, if necessary)**

Awareness of the abstract nature of theoretical mathematics and the ability to write proofs are difficult things to assess in students. However, these skills are not only highly intertwined with each other, to the point of being difficult to separate, they are also highly intertwined with the critical thinking skills and thought processes that are inherent in the other student learning outcomes. Therefore, all of the questions on the capstone surveys in some way touch on this student learning outcome.

For the questions on the capstone surveys, the students are ranked on a scale of 1 to 5 where 1 is "very poor", 3 is "adequate", and 5 is "excellent". Prior to this year, the scale was 1 to 9 where 1 was "very poor", 5 was "adequate", and 9 was "excellent". The scores from the prior two years are listed in parenthesis.

For the question regarding rigorous analytical thought, the students were given a mean score of 3.91 (5.96 and 6.76).

For the question regarding the communication of ideas in a precise manner, the students were given a mean score of 3.91 (6.20 and 6.74).

For the question regarding the understanding of the breadth of the field, the students were given a mean score of 3.72 (5.78 and 6.58).

For the question regarding the understanding of the deep interconnecting principles in mathematics, the students were given a mean score of 3.38 (5.60 and 6.48).

For the question regarding the ability to solve multistep problems, the students were given a mean score of 4.13 (5.90 and 6.62).

For the question regarding the ability to perform complex tasks, the students were given a mean score of 3.91 (5.88 and 6.52).

For the question regarding the ability to detect basic mathematical patterns, the students were given a mean score of 3.75 (5.72 and 6.44)

For the question regarding the ability to generalize from basic mathematical structures, the students were given a mean score of 3.31 (5.44 and 6.26).

The scores for the multistep problems and complex tasks appear to be increasing. The scores for the interconnecting principles and generalization appear to be staying the same. The other categories appear to be either staying the same or increasing slightly.

**5. Describe and explain available trend data for student performance on this outcome over the past several years. In other words, describe how the results of this measure have changed over the past several years.**

See above.

**6. Proposed action in response to results.** (Please note if improvements can be made with existing department resources. If improvements cannot be made with existing department resources, consider applying for an Instructional Improvement Grant.)

Although there are still issues to resolve, we are considering the feasibility of making Math 225 (Discrete Mathematics), in a modified form, a required course for our majors. It would provide our students with an introduction to proofs and be our gateway course for our abstract classes. The ability to do mathematical proofs is fundamental when dealing with abstract mathematical concepts.

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*Instructions: Include this form for each student learning outcome assessed during the previous year. Include Assessment Report Cover Sheet.*

**Academic Program: B.A.'s and B.S.'s in Mathematics**

**1. Learning outcome assessed (please include the number of the outcome to correspond with the list on the cover sheet).**

4. Students should possess an understanding of the breadth of the mathematical sciences and their deep interconnecting principles.

**2. Describe assessment measure used for this learning outcome (attach instrument or rubric)**

Survey in capstone courses.

**3. Expected/satisfactory student results (from assessment plan)**

None is prescribed. We study the results for trends and react accordingly.

**4. Actual results from the past year (attach additional information, if necessary)**

For the questions on the capstone surveys, the students are ranked on a scale of 1 to 5 where 1 is "very poor", 3 is "adequate", and 5 is "excellent". For the question regarding the understanding of the breadth of the field, the students were given a mean score of 3.72. The scores in the previous two years were 5.78 and 6.58 (on a scale of 1 to 9). For the question regarding the understanding of the deep interconnecting principles in mathematics, the mean score was 3.38. The scores in the previous two years were 5.60 and 6.48 (on a scale of 1 to 9). The scores appear to either be staying the same or slightly increasing for the question regarding breadth of the field, and appear to be staying the same for the question regarding the deep interconnecting principles.

**5. Describe and explain available trend data for student performance on this outcome over the past several years. In other words, describe how the results of this measure have changed over the past several years.**

See above.

**6. Proposed action in response to results. (Please note if improvements can be made with existing department resources. If improvements cannot be made with existing department resources, consider applying for an Instructional Improvement Grant.)**

Although there are still issues to resolve, we are considering the feasibility of making Math 225 (Discrete Mathematics), in a modified form, a required course for our majors. It would provide our students with an introduction to proofs and be our gateway course for our abstract classes. In addition to focusing on proofs, dealing with discrete mathematics would add breadth to our major. The other lower-level courses (in particular the calculus sequence) focus on mathematics in continuous spaces rather than discrete ones. Proofs also help students build an understanding of how skills in one field of mathematics affects other fields.

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**Academic Program: B.A.'s and B.S.'s in Mathematics**

**1. Learning outcome assessed (please include the number of the outcome to correspond with the list on the cover sheet).**

5. Students should be able to solve multi-step problems and perform complex tasks.

**2. Describe assessment measure used for this learning outcome (attach instrument or rubric)**

ETS Major Field Test in Mathematics.  
Survey in capstone courses.  
Success on the Society of Actuaries Exam I.

**3. Expected/satisfactory student results (from assessment plan)**

None is prescribed. We study the results for trends and react accordingly.

**4. Actual results from the past year (attach additional information, if necessary)**

In comparison to the other institutions taking the Major Field Test in Mathematics, our students were at the 20<sup>th</sup> percentile in the “Non-Routine Problems” subscore and at the 35<sup>th</sup> percentile in the “Applied Problems” subscore. In the previous two years, for “Non-Routine Problems”, our students were at the 10<sup>th</sup> percentile, and for the “Applied Problems” were at the 35<sup>th</sup> and 45<sup>th</sup> percentiles. We note that our scores appear to be staying the same in both categories. Some variation is expected due to small numbers of students taking the exam each year.

Although we are not happy with these scores, we do note that we have a larger number of transfer students than the comparison group (40% for the two years, compared to 25% for all students taking the test). We also have students with lower self-reported major GPA's. The combination of these GPA values with the low percentile rankings we take as an indication that we are recognizing that our students are not performing at the level that we wish them to perform as we assess individual students in the classrooms.

For the questions on the capstone surveys, the students are ranked on a scale of 1 to 5 where 1 is "very poor", 3 is "adequate", and 5 is "excellent". For the question regarding the ability to solve multistep problems, the students were given a mean score of 4.13. The scores in the previous two years were 5.90 and 6.62 (on a scale of 1 to 9). For the

question regarding the ability to perform complex tasks, the students were given a mean score of 3.91. The scores in the previous two years were 5.88 and 6.52 (on a scale of 1 to 9). The scores for either of these questions appear to be increasing.

Of the five students who took the actuarial exam in the last year, three passed, one did not, and one score is unknown. In the previous year, three out of four students who attempted the Society of Actuaries Exam I passed the exam.

**5. Describe and explain available trend data for student performance on this outcome over the past several years. In other words, describe how the results of this measure have changed over the past several years.**

See above.

**6. Proposed action in response to results.** (Please note if improvements can be made with existing department resources. If improvements cannot be made with existing department resources, consider applying for an Instructional Improvement Grant.)

Our impression with calculus students is that they were just skill building in the course. Our changes in the calculus sequence include an attempt, through the lab activities, to get students to use calculus in applied situations, which often include more than just one step to solve. As such, we anticipate that those students who go through the calculus sequence after our changes will improve in this measure. As in the case with student learning outcome 1, we don't expect to see much affect from these changes until those students take the ETS exam and capstone courses as seniors (Fall 2010).

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**Academic Program: B.A.'s and B.S.'s in Mathematics**

**1. Learning outcome assessed (please include the number of the outcome to correspond with the list on the cover sheet).**

6. Students should develop the ability to detect basic mathematical structures (patterns) and make generalizations from them.

**2. Describe assessment measure used for this learning outcome (attach instrument or rubric)**

ETS Major Field Test in Mathematics.  
Survey in capstone courses.

**3. Expected/satisfactory student results (from assessment plan)**

None is prescribed. We study the results for trends and react accordingly.

**4. Actual results from the past year (attach additional information, if necessary)**

In comparison to the other institutions taking the Major Field Test in Mathematics, our students were at the 20<sup>th</sup> percentile in the "Non-Routine Problems" subscore and at the 35<sup>th</sup> percentile in the "Applied Problems" subscore. In the previous two years, for "Non-Routine Problems", our students were at the 10<sup>th</sup> percentile, and for the "Applied Problems" were at the 35<sup>th</sup> and 45<sup>th</sup> percentiles. We note that our scores appear to be staying the same in both categories. Some variation is expected due to small numbers of students taking the exam each year.

For the questions on the capstone surveys, the students are ranked on a scale of 1 to 5 where 1 is "very poor", 3 is "adequate", and 5 is "excellent". For the question regarding the ability to detect basic mathematical patterns, the students were given a mean score of 3.75. The scores for the previous two years were 5.72 and 6.44 (on a scale of 1 to 9). For the question regarding the ability to generalize from basic mathematical structures, the students were given a mean score of 3.31. The scores for the previous two years were 5.44 and 6.26 (on a scale of 1 to 9). We note that the scores for detecting mathematical patterns are either staying the same or increasing slightly. The scores for generalizing from mathematical structures appear to be staying the same.

**5. Describe and explain available trend data for student performance on this outcome over the past several years. In other words, describe how the results of this measure have changed over the past several years.**

See above.

**6. Proposed action in response to results.** (Please note if improvements can be made with existing department resources. If improvements cannot be made with existing department resources, consider applying for an Instructional Improvement Grant.)

Although there are still issues to resolve, we are considering the feasibility of making Math 225 (Discrete Mathematics), in a modified form, a required course for our majors. It would provide our students with an introduction to proofs and be our gateway course for our abstract classes. By their very nature, proofs encourage students to think in terms of the basic mathematical structures of the issue that they are dealing with and make generalizations.



## Department of Mathematics

### Meeting Minutes – November 13, 2006

Present: Hatzenbuhler, Chair, Chen, Drouilhet, Harms, Hill, James, Montis, Ng, Peil, Rath, Rhoads, Rothmann, Schmiess, Sizer, and Wolff; absent: Emmel, Lima, Schwert, Stockrahm, and Wijetunga; (Ali - on leave); guests: Dean Ron Jeppson, Associate Dean Tim Borchers and Outreach Coordinator Shawn Dunkirk

This meeting convened at 3:15 *p.m.* in LO 091 by Chairman Hatzenbuhler and was turned over to Dean Jeppson.

This meeting was held to confer about Outreach (Dunkirk); and Program Assessment, Department Planning and Reporting, Publicity Activities, and Re-Accreditation (Borchers).

Dunkirk distributed an outreach handout. She began by stating how important it is to get the publicity out about the things we host on campus, and that we're willing to go to schools to conduct workshops, demonstrations, experiments, *etc.* The outreach brochure will be revised this year, as we have new departments in the college and have lost a few as well. The brochure lists the departments within the college and the activities they could lead and/or speak about. Dunkirk advised that if there are any other topics for mathematics that are not included, to please let her know them. It is her intent to get this outreach information online on the CSNS webpage by the end of this semester.

Dunkirk thanked Montis and Peil for their work on the October 23 "World of Change" stating they received great reviews for mathematics. She mentioned another activity coming up on December 2, "Discovery for Girl Scouts" (3rd, 4th and 5th graders), and thanked Montis and Ng for volunteering to do this one.

Dunkirk highlighted other activities for the rest of this academic year: On February 9 is the "Science Olympiad". They are hoping to get more teens from as far as West Metro. The math methods students do a lot here, but need a faculty mentor; please let her know if interested. On February 24 is the "Regional Science Fair" and she will need volunteers for this also. Harms will notify Dunkirk of the exact dates for the TCU Math Competition to be hosted by Concordia College this year (MSUM writes the exams.)

Other activities that are coming up of which more information will be available later, and that also needs volunteers, are the March 24 "Discovery for Junior Girl Scouts", "Expanding Your Horizons" the middle of April (funds for supplies are available – let Dunkirk know), and the May 10 "Science and Math Day for high school juniors. If there are any other activities, let Dunkirk know so they can be included on the webpage.

Dunkirk is collecting data for these outreach events for the Dean's annual report. The data includes stats and descriptions of the events, any other comments about it, and what aspects could be improved upon. The form for filling in this information is online now and will save time when compiling the report. She went over filling out the online form. The new updated form will have space for your email address so evaluation forms can be sent to the requester. It is important for departments to relate to all their kudos Dunkirk, so she doesn't miss any thing.

November 13, 2006

Page 2

The Dean said that the data can sometimes go to Legislators so they can know about our outreach efforts, which helps with securing remodeling funds and other things; and it is used as a means to brag about our university. These reports go to MnSCU also.

Montis asked if we still report even though the event is arranged by Dunkirk, and she said yes, so she will know of any improvements, and that multiple faculty names can be on a report of the same event. Borchers added that he would like to know about any publicity activities, too, so he can get them out through his publicity means and that it is always a good idea to Cc him and Dunkirk when sending items to Continews.

Borchers said that the North Central Accreditation (NCA) team of six people will be here on Monday-Tuesday-Wednesday, March 5-6-7, 2007, arriving on Sunday and leaving that Wednesday. The report will be finished soon, and the final version will be out on the [NCAvisit](#) webpage. When the team comes they will be interested in the MLC, as it is mentioned many times in the different criteria; and they may want to meet with students.

Borchers informed us that the Scheduling Task Force has been circulating information, and it will be on the agenda at APAC tomorrow (11/14/06). The number of sections available is a concern, as there is no intent to limit the number, and we would not want to inconvenience the students. The intent is to reduce the overlap in student's schedules, as some come 10-30 minutes late because of it. Rath asked if MSCTC would be going to the half-hour option and Jeppson replied that no they wouldn't, now would Gateway.

Borchers distributed a handout on the Assessment Committee's assessment of our assessment plan. They met this morning, and as an overview we are doing a good job of gathering data, but we need to tweak it more to be able to gather more significant data.

The capstone survey is on a 9-point scale, and they are trying to get departments to shrink them to a 3- or 4-point scale in order to make the survey tighter. Using specific assignments as an evaluator is another suggestion so the results can be as defined as possible. Borchers also said that it is good to have some baseline data with either the

ETS Major Field Exam, or the capstone survey as it will help prioritize your responses, and to have some level of expectations.

Borchers also stated that it is good we are working more on calculus. There are grants (up to \$7500 is available) to fix what is wrong. Applications are due January 31, 2007. They could be used as duty days in the summer, or as resources. Mathematics has a good basis for making a case, and people can share the grants. The Southwest SU webpage is a source to peruse to view their grant application and assessment. Borchers also advised that in the future we might want to think about rephrasing our outcomes, measurements, and/or rubrics. We can change our plan at any time, also, and he would be happy to meet with our assessment committee any time. Hatzenbuhler added that the calculus project is long-term, and waiting for ETS scores also delays it; this could take up to three years.

Borchers dispensed a handout on planning, citing the department had their six-year report and visit last academic year. The quality improvement plan was due last year to be reported on this year. A new way of doing things is to work on a 1- or 2-year plan. Borchers suggested we do it this way. When reporting we need to state our goals. A good guide is the Delaware study form that charts accomplishments and advising. When planning items we should identify 2-3 goals that go with the

November 13, 2006  
Page 3

Academic Affairs master plan, and also some long-term goals. The other questions on this form help with the Dean's budget (equipment/staffing/operating expenses/student requests). This will become an annual thing to compile. The Dean said that the advantage to the new way is to consolidate things done over the years into one package.

Hatzenbuhler interjected that a small goal for us would be spending more time with students. Borchers said they are looking for something significant and focused, not so philosophical, but more like non-routine things as opposed to being close to student-credit ratios. It could also be a goal that related to it, like decreasing class sizes. Borchers also stated that we need to set goals that we can control, that we don't need to list a lot either, and that they can be to the point of being daring, even if they're not successful. Montis expressed a concern that if we're not successful, would that mean we're not a successful dept. Borchers said we'd be deemed more worthy than a department who sets smaller goals. Jeppson corroborated stating we won't be measured on failures. Montis mentioned giving a placement exam in classes early on to cut down on the shuffling between classes, as an example. Dean Jeppson supports the department's initiative to give a placement exam the first day, and Borchers added that there is a task force to address these issues now, and eventually that may help.

Drouilhet averred that final exams are important, and that during the final exams period this semester, a basketball team will be gone for three weeks, part of that time during

finals. This was bothersome and irritating for many in the meeting. The Dean agreed and suggested we contact President Barden as to why he approved this.

There was general discussion about other concerns. There is poor attendance in the 8 o'clock M102; perhaps the new scheduling may make a difference if classes start at 8:30. Additionally, there is help available with a specific tutor room for them. Peil asked if we will have repercussions if we hold the line on M102 grades, as it appears about a third won't make it? Dean Jeppson said the university can't come to us and ask us to lower our standards. Also that may be an opportunity to fix what is wrong, e.g. four days a week and a lab; or we don't need a math course in the dragon core, as the Corrick Center one will suffice. Borchers suggested gathering data as we go to help identify problems. Lastly, we should let Jeppson and/or Borchers know if there are any problems obtaining the data we need to analyze the problems.

It was inquired what the philosophy of admitting students was for those who are not prepared. The Dean said that they will continue to be admitted, and that our admit policies are actually higher than most for the regular campus (need a high ACT and be in the upper 50% of HS class). The quals for the Corrick Center are for borderline students, and Gateway is for even lower ones.

We were adjourned at 4:30 *p.m.*

Respectfully submitted,

Sheryl Jones, Recorder

Cc: President Roland Barden  
Vice President Bette Midgarden  
Dean Ronald Jeppson

## Department of Mathematics

### Meeting Minutes – October 26, 2007

Present: Hatzenbuhler, Chair, Chen, Drouilhet, Emmel, Goyt, Harms, Hill, James, Montis, Ng, Noland, Peil, Rath, Rhoads, Rothmann, Schmidt, Sizer, Wijetunga and Wolff; absent: Schmiess

This meeting convened at 2:30 *p.m.* in MacLean 269 by Chairman Hatzenbuhler, and followed the previously distributed agenda.

#### 1. Assessment Report

1. Should we have a statistics-learning outcome?
2. Should we use the results of the Praxis II exam for assessment? (Are there logistic issues involved?)

This report was carefully discussed. It was agreed not to set goals for the ETS field test or the capstone courses evaluation. Harms stated that Praxis II is a good addition to our assessment measurements. Hatzenbuhler said that in the Learning Outcomes, there is nothing about stats and wondered if it should be included? Sizer pointed out that some grads are transfers who may have fulfilled their math requirement without a stats course, and unless it's required, we shouldn't assess students in that way. It was observed that if students don't take a stats course, they must take M102, and would that enough of an assessment? Do we want to require our majors to take Math 335 rather than allowing them to just take M102? This item was tabled for further investigation and discussion.

#### 2. Professional Master's Degree program

On Tuesday, November 6<sup>th</sup>, Hatzenbuhler will be attending a Graduate Studies Advisory Board meeting for this, and will report back about this program. This program is intended for the student to be able to go to work immediately, and not on to a higher education degree. The Economic Development Committee wants a well-trained work force and hopes to offer internships, scholarships, etc. Hatzenbuhler posed the following: What suggestions do we have? Do we wish only to offer courses to assist other programs or suggest programs in which we play a major role?

Goyt suggested that the role of math could be a survey course with sections like finance, computer science, engineering and design. Then the student could select the professional degree to pursue. Hatzenbuhler inquired whom we'd be recruiting to take this course? Goyt offered to have everybody start with this course and then they could go from there. Hatzenbuhler surmised that this might be useful once programs are underway.

James proposed a foundations of applied mathematics tailored to other disciplines and how it's applied, maybe incorporating projects to enhance it. Goyt submitted that we could see what industry's problems were that need solving, too. Students could problem solve and submit a solution. And, it might bring in money to fund these programs. We would be the center of the wheel with other departments spreading out from us. Montis felt students often will be deficient in math, and we should provide courses that respond to this.

Hatzenbuhler emphasized that he needs reactions from the department for the meeting next month. They need to know which program to set up first. We will be supportive of any math courses they need.

Department of Mathematics  
October 26, 2007  
Page 2

3. Math 225, Discrete Math, as requirement for major

Hatzenbuhler and Rhoads have talked to CSIS concerning the content in this course and agreed to designate Math 262, Calculus II, as a co-requisite. It will be taught at a lower level than M391, and would be a prerequisite for "proofs" courses. Hatzenbuhler would like to offer it every semester. However, this may cause the student/faculty ratio to go down. A way to make up for this would be to raise the limits in the other classes to 33-35; this also might allow us to offer other courses.

Another query was should we raise the number of credits for majors, or take away the elective if M225 is required? The consensus was that there would be no problem with raising some course limits by 3-5 students. Harms also cautioned that then the Math Ed track would not have an elective, so those enrollments may go down. We would want to offer it fall semester for sure, if not able to offer both semesters.

It was moved by Hill and seconded by Rhoads to raise all degree programs by four hours to include M225. There was discussion. The benefits out rank the drawbacks, and it may help transfer students have a better base to take the 300 and 400 level courses. We would want to make it effective by next fall after it goes through APAC. It would also need to go through the Teacher Prep Committee. Additionally, if there are any problems, we can always revisit it. The next step would be to prepare the paperwork. The question was called. A vote was taken and it carried.

4. Stem grant Application

Linda Winkler, Physics, has an NFS grant to help students with low economic background to study for math and sciences, and engineering. It would recruit students to come here and to do interdisciplinary activities, and students with good aptitude in math and sciences will be considered. We will need math faculty to work with those students who pick math. We would also be targeting students who might go on for a masters or doctorate. At the TCU math contest Harms will ask for a list of these potential students. Anyone interested in mentoring these students – helping them prepare for projects, contests, etc. - should contact Harms.

5. Include Stat requirement in major?

The department determined not to do so for now.

6. Remove Books in Conference Room

The new conference table is arriving soon and we need a reference library location for about 50 books. Drouilhet stated that many of the books are stats journals. A bookshelf in the tutor room is a possibility, but we may need to remove one table to make room. It was inquired that if these journals aren't used, why do we keep them, or else store them? These were a

donation from a former student. Another suggestion was to use some space in the technology library in Hagen. Noland also offered to donate some shelf space in his office. In the interim, Drouilhet offered to keep some at home, also. Hatzenbuhler suggested the need to prune the collection too. The computer lab could be used to sort the books until the computers arrive. Drouilhet will spearhead this plan of action and select volunteers to help.

#### 7. Items From October 11th CSNS Chairs' Meeting:

Department of Mathematics  
October 26, 2007  
Page 3

##### a) Recruiting materials, for Admissions and for us:

We need WOW factors, i.e., standout things we can tell recruiters, and/or show by pictures. Hill responded with ideas of students working together in the tutor room, the computer room, on calculus projects, or in classrooms of M102. Hatzenbuhler added that we have great alumni that we should tout also. Any information the faculty has about alumni, whether in sports and/or academic, should let him know. One current example is Jill Rivinius who was named the 2007 MSUM Homecoming Queen. Pop-ups on our web page was another idea presented. Hatzenbuhler stated that we need someone to do this. Goyt offered to do this project; and Montis and Noland volunteered to work with him. Goyt will also talk to other faculty for information and suggestions.

##### b) Calling tree for department

When the school becomes shutdown due to weather or other emergency, the Dean contacts the chairs, who then contacts the department members implementing a calling tree. Hatzenbuhler will create this and inform the department accordingly.

##### c) Equipment

There is some money available and the Dean wishes requests from departments for needs. The first priority will be for courses in the spring, then equipment or new initiatives. Let Hatzenbuhler know of any other ideas. Harms also added along this line that Constructional Technology has mini-grants worth a few hundred dollars each, and that applications are due Friday, November 9<sup>th</sup>.

##### d) Dragon Core courses by Math.

Writing intensive courses are in great demand. If you have courses that seem to fit, you may want to consider it.

#### 8. State cars and Enterprise

Rath stated that one who is traveling does not need to use a state car, but can use a rental from Enterprise®. The Dean's office says we can put it on an MSUM charge card, and could save as much as half the cost.

#### 9. Other

Recruitment pamphlets need to be updated so we have something to hand out. These are for occupational purposes as opposed to the departmental brochure. Hatzenbuhler will need help with these also.

Worksheets for the tracks need updating also. The Math Ed committee will make the necessary changes. Also, the calculus credits on the liberal arts section will need to be changed; also M225 will be added, and the total hours changed.

There is a graduate school file for students to peruse.

Department of Mathematics  
October 26, 2007  
Page 4

We have bulletin boards around the department to be used.

Physics is concerned about the Dragon Core statistics requirement. They do not want to require another course in the major, and besides, none of our statistics classes meet their needs. Perhaps a better course could be developed for Physics and Chemistry. We need to be watchful and eliminate any potential problems, e.g. other departments offering stats courses.

Peil mentioned that many transfer students enter MSUM with credit for College Algebra, but do not know enough to succeed in Math 229. Many cannot audit our College Algebra due to credit hour requirements in certain scholarship and Veteran's programs. Perhaps we should offer a 2-hour Math 129 course, which includes a review and topics such as logarithms.

Summer School – now Academic Affairs fixes the number of allocations for summer and if the allocations go over this time, it comes out of the next academic year. In the future we will be given a certain number of allocations. If the class has less than 12 enrolled, we will lose it next year. Hatzenbuhler will let the department know what courses will be taught, and get a clarification on the six hour rule, i.e., can a professor teach a four credit and a three credit course in a session; or is six hours the maximum, thus limiting the professor to only one class in the session?

Some indicated that the stat attachments sent by Dean Jeppson are un-openable. It was determined it may be because those are in Windows 2007, or because its forwarded.

Drouilhet stated that he and Matt Craig may initiate a series of evening videos for math students and physics students.

Mathematics alumnus Angie Hodge of NDSU will present at the TCU Math Colloquium next Thursday, November 1, at Concordia at 3:30 p.m. We should try to attend this.

Hill inquired of the mathematics Assessment Committee if they want their name on the report Hill will present. It was decided Hill need only sign her name.

Hatzenbuhler advised that his chair term is up in 2009. He asked the department to think about this and to let him know who's interested. Hatzenbuhler said it's also possible he may do it one more year afterwards as a transition thing.

We were adjourned at 4:00 *p.m.*

Respectfully submitted,

*Sheryl Jones*

Sheryl Jones, Recorder

Cc: President Roland Barden  
Vice President Bette Midgarden  
Dean Ronald Jeppson