Report

Goals

The Department of Mathematics supports the mission of the university in preparing students for professional success, democratic citizenship in a global community, and a personal life of meaning and value. The mission of the department is to produce graduates who achieve the following learning outcome goals:

1. Applied Mathematics

An applied mathematics major will

a. be able to integrate and differentiate functions,
b. be able to express and interpret mathematical relationships from numerical, graphical and symbolic points of view,
c. be able to read and construct mathematical proofs in analysis and algebra, and
d. be able to apply mathematics to at least two areas taken from biology, physics, chemistry, economics or computer science.

2. Mathematics Education

A mathematics education major will

a. be able to pass the Illinois high school mathematics certification exam,
b. know in broad terms the history of calculus, algebra, and probability,
c. have prepared at least 2 lesson plans in mathematics, and
d. have served as an teaching intern for a member of the mathematics faculty

4. To prepare students for professional success.
    a. Applied mathematics we provide core mathematical experiences and a range of application areas to prepare students for work or graduate study.
    b. Mathematics education we prepare students for the Illinois State Certification Exam, give them experience in teaching, and keep them current on the use of technology in mathematics education.
    c. Computer science we train students in fundamental programming techniques and theory so that they can learn new technologies in this rapidly changing field.

5. To prepare students for democratic citizenship in a diverse and dynamic global environment.
    a. Applied mathematics- we provide fundamental tools to analyze dynamic events that will inform public policy.

b. Mathematics education- in a world where political leaders are becoming increasingly numbers driven, we provide the teachers the skills to empower children by enhancing their ability to reason quantitatively.
c. Computer science-

and 8 in spring 13). The adjunct load has remained constant at 2 FTE for years with PACE contributing 1 FTE.

Description Applied Mathematics**.** The applied mathematics major is for students interested in immediate employment or further study in applied mathematics or in actuarial sciences. Applied mathematics majors take a minimum of 33 credit hours in mathematics. The core courses and required advanced courses are those specified in *Undergraduate Programs and Courses in the Mathematical Sciences: CUPM Curriculum Guide 2004* by the Committee on the Undergraduate Program in Mathematics of The Mathematical Association of America.

Description Mathematics Education. The Mathematics-Secondary Teaching major is a rigorous course of study in mathematics and education. The major has 38 required credit

final exams each semester to verify the assertion that expressing and interpreting mathematical relationships from numerical, graphical and symbolic points of view was necessary to pass the exams.

a. See attached final exams and reviews of these finals by the individual faculty members.

3. be able to read and construct mathematical proofs in analysis and algebra, and

   All Applied Mathematics majors are required to take and pass Discrete Mathematics, Calculus III and Linear Algebra. It is the consensus of the department that it would not be possible to pass these three courses without the ability to read and construct mathematical proofs in analysis and algebra. Therefore verifying the completion of these two courses by all Applied Mathematics majors will assess fulfillment of this goal. Additionally, the department chair will collect copies of all Discrete Mathematics, Calculus III and Linear Algebra final exams each semester to verify the assertion that reading and constructing mathematical proofs in analysis and algebra was necessary to pass the exams.

   a. Discrete Mathematics, Calculus III and Linear Algebra were all offered this year. A copy of the final exams from Calculus III and Linear Algebra are attached. A review of these exams support the contention that it would not be possible to pass these three courses without the ability to read and construct mathematical proofs in analysis and algebra. See attached final exams and reviews of these finals by the individual faculty members.

4. be able to apply mathematics to at least two areas taken from biology, physics, chemistry, economics or computer science.

   All Mathematics majors are required to take Calculus I and II and Discrete Mathematics. The final exams from all sections of these courses will be review by the department chair to ensure that these routinely contain problems from biology, physics, chemistry, economics or computer science. Specifically, physics will be covered in Calculus I; biology, chemistry, and economics in Calculus II, and computer science applications in Discrete Mathematics.

   a. This review was completed and verified that the exam contained appropriate problems involving biology, physics, chemistry, economics or computer science. All final exams for these courses are attached. Again, see attached final exams and reviews of these finals by the individual faculty members.

Assessing the Mathematics Education Major Goals

A mathematics education major will

1. be able to pass the Illinois high school mathematics certification exam,

   The department chair will verify that each Mathematics Education major has

passed the state certification exam prior to student teaching. Additionally, the chair will note and analyze the subject area sub scores on an ongoing basis to determine the need for curricular change.

a. All students passed the state exam!
b. The program is nationally accredited!!

2. know in broad terms the history of calculus, algebra, and probability,

   All Mathematics Education majors are required to take and pass Mathematics History to graduate with an Mathematics Education degree. It is the consensus of the department that it would not be possible to pass this course without knowing in broad terms the history of calculus, algebra, and probability. Therefore verifying the completion of this course by all Mathematics Education majors will assess fulfillment of this goal. Additionally, the department chair will audit the Mathematics History syllabus each semester to verify the assertion that the assignments cover the history of calculus, algebra, and probability. Samples of student work will also be collected by the instructor for chair evaluation.

3. have prepared at least 2 lesson plans in mathematics, and

   All Mathematics Education majors will be required to submit 2 graded lesson plans to the department teaching supervisor prior to student teaching. These lesson plans may come from a variety of courses; MA 425 Teaching Secondary and Middle School Mathematics, MA 471 Mathematics Internship, or any other education course that required the completion of a mathematics lesson plan.

   a. Lesson plans for MA 425 and MA471 were collected and reviewed by the department. Dr. Paula R. Stickles has taken over this assessment.

4. have served as a teaching intern for a member of the mathematics faculty

   In support of this goal, all Mathematics Education majors are required to take and pass the departmental teaching internship MA 471 to graduate with a Mathematics Education degree. The departmental chair will collect and analyze the end of course reflection required for this internship to determine the effectiveness of the experience.

   a.

Student Publications and Presentations
Department of Mathematics
2010-2013
(Contact Dr. Joe Stickles for the most current list)

Peck, H. Summer Undergraduate Research Fellowship, Millikin University. One of five recipients. (Summer 2012)

Bloome, L. Accepted to the Summer Mathematics Institute at Cornell University, Ithica, NY. One of twelve participants in a summer program learning analysis and completing a research project (June-July 2012)

Bloome, L. Conference Presentation. *Connections between Central Sets and Cut Sets in Zero-Divisor Graphs of Commutative Rings*, Rose-Hulman Undergraduate Mathematics Conference, Terre Haute, IN, twenty minutes. Recognized as one of the five best talks of the conference. (April 2012)

Buhrmann, J. Conference Presentation. *The U.S. Life Insurance Industry: Time Series Analysis*, Rose-Hulman Undergraduate Mathematics Conference, Terre Haute, IN, twenty minutes. Recognized as one of the five best talks of the conference. (April 2012)

Perkins, M. Conference Presentation. *The Predicted Success Rate in Lower 10 Percent of Accepted Students*, Rose-Hulman Undergraduate Math

Morin, M. Conference Presentation. *Formalizing Course Materials for a Quantitative Reasoning Course*, University of Dayton Undergraduate Mathematics Day, Dayton, OH, fifteen minutes (November 2011)

Stickles, P. and **Morin, M.** Conference Presentation. *Undergraduate Fellows Program AKA Getting an Undergraduate to Do Your Work and Enjoy it!* Annual Meeting of the Illinois Council of Teachers of Mathematics. Springfield, IL, sixty minutes (October 2011)

Stickles, J., **Helding, C.**, and **Morin, M.** Conference Presentation. *Undergraduate Teaching Internship Program at Millikin University*, Annual Meeting of the Illinois Council of Teachers of Mathematics. Springfield, IL, sixty minutes (October 2011)

Lee, E., Lee, S., Elliot, D., Mathy, K., and **Walker, D.** Interval Estimation for Extreme Value Parameter with Censored Data, ISRN Applied Mathematics (2011), Article ID 687343, 1-12.

Weber, D. Zero-Divisor Graphs and Lattices of Finite Commutative Rings, Rose-Hulman Undergraduate Math Journal, 12 (2011), no. 1, 58-70.

Coté, B., Ewing, C., Huhn, M. and Plaut, C., **Weber, D.** Cut-sets in Zero-Divisor Graphs of Finite Commutative Rings, Communications in Algebra, 39 (2011), no. 8, 2849-2864

Weber, D. James Millikin Scholar Project. Zero-Divisor Graphs and Zero-Divisor Lattices of Finite Commutative Rings. Received Outstanding JMS Project Award. (May 2011)

Stickles, P., **Helding, C., and Smith, B.** Conference Presentation. Authentic Teaching Experiences in Secondary Mathematics Methods Courses. Annual Meeting of the National Council of Teachers of Mathematics. Indianapolis, IN, sixty minutes (April 2011)

Bloome, L. Conference Presentation. Compressed Zero-divisor Graphs of Finite
Hulman Undergraduate Mathematics Conference, Terre Haute, IN, twenty minutes (March 2011)

Luciano, G. Conference Presentation. Usings Data Mining to Determine Academic Success

Coté, B., Ewing, C., Huhn, M. and Plaut, C., **Weber, D.** Cut-sets in Cut-

Table 1. Full time faculty: Mathematics

Faculty	Highest Degree	Rank	Tenure Status	Year Hired	Specialty Field	Courses taught
James Rauff	Ph.D.	Professor	Tenured	1988	Formal Languages, Computational Linguistics, Ethnomathematics.	Discrete Math, Computing Theory, History of Math, Linear Algebra, Calculus, Remedial Algebra.
Randal Beck	Ph.D.	Associate Professor	Tenured	1979	Partial Differential Equations, Statistics.	Calculus, Statistics, Differential Equations.
Daniel Miller	Ph.D.	Professor	Tenured	1997	Mathematics Education, Geometry, Educational Technology.	Teaching Methods, Precalculus, Geometry, Remedial Algebra
Joe Stickles	Ph.D.	Professor	Tenured	2006	Ring Theory.	Calculus, Liberal Arts Mathematics, Abstract Algebra.
Eun-Joo Lee	Ph.D.	Assistant Professor	Tenured	2006	Mathematical Statistics.	Statistics, Calculus.
Paula Stickles	Ph.D.	Associate Professor	Tenured	2006	Problem Solving/Posing, Mathematical Modeling	Secondary Methods, Calculus, Mathematics Content for Elementary Teachers

Appendix 1

Appendix 2