

Millikin University  
Student Learning in the Mathematics and Computer Science Major  
for Academic Year 2006-2007



- 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- we provide the skills necessary for students to succeed in an increasingly technological world
3. To prepare students for a personal life of meaning and value we help our students develop the intellectual framework, and instill in them the mindset, that will enable them to remain life-long learners. Our students are taught to think rigorously and rationally, and to revel in the sheer pleasure of thinking.

### Snapshot

The Department of Mathematics and Computer Science guides students in the completion of three different majors: mathematics education, applied mathematics, and computer science. Currently, 46 students are following one of our major programs of study. There are 14 students majoring in computer science, 14 in mathematics education, and 18 in applied mathematics. The Department also serves elementary education students with mathematics concentrations.

General Description. The Department of Mathematics and Computer Science includes the disciplines of mathematics, computer science, and statistics. The department offers majors in Applied Mathematics, Mathematics- Secondary Teaching, and Computer Science. Minors are offered in Applied Mathematics and Computer Science. Elementary Education majors take a concentration in mathematics. The curriculum is structured to meet the overlapping needs of students who fall in one or more of the following categories:

those who plan to become high school mathematics teachers;

those who plan to have careers in computer science;

those who will apply mathematics and/or computer science in the natural sciences, social sciences, business or other areas of quantitative studies such as actuarial science.

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 hours in mathematics. Unique among institutions of comparable size we require a mathematics teaching internship experience as part of our program. During this experience, the student is paired with a member of the faculty in teaching an undergraduate mathematics course.

### The Learning Story

Applied mathematics and mathematics education majors follow nearly the same curriculum within the Department. The Department believes that to be a good mathematics teacher one needs to know mathematics. Therefore, the education majors are expected to compete successfully with the applied majors in most of their mathematics courses. The program assumes entering students can start with calculus the fall of their freshman year. Additionally, education majors are advised to have completed the core of

our majors to score a 5 (the suggested score for placement into Calculus I). Computer science students are expected to start with Computer Programming I and Discrete Mathematics. Students are assessed within our programs in numerous ways: course exams, problem sets, and written and oral demonstrations. Additionally, the Department

relationships from numerical, graphical and symbolic points of view was necessary to pass the exams.

- a. In the spring of 2007 Differential Equations and Numerical Analysis were not offered. Dr. Rogers taught MA 208 Discrete Mathematics in the spring

- a. All students passed the state exam! A curricular concern was noted. The exam is partitioned into five content areas and no student received a passing score on the statistical portion of the exam. Dr. Beck is reviewing the content on this part of the exam and will be adjusting the required statistics courses.

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 a 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.

- a. Math History was not offered in the spring of 2007.

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

All Mathematics Education majors will be required to submit 2 graded lesson plans to the department chair prior to student teaching. These lesson plan may come from a variety of courses; MA 425 Teaching Secondary and Middle School Mathematics, MA 471 Mathematics Internship, or any other education cou2 350.33 Tm{other)5(r95.691350.33 Tm{ose)6( bh)-11(e)4(t le)5(duire)5(



## Assessing the Computer Science Major Goals

A computer science major will

1. be able to write, modify and debug programs in Java, C++, and at least one other programming language,
2. understand the mathematical theory of computer science and how that theory is manifested in computer science practice,
3. be comfortable working with a variety of operating systems and be able to write web software, and



## Appendix 1

## Appendix 2

