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Mathematics Form B: Discipline Objectives and Requirements 09/03/2004

Curriculum Committee

UNIVERSITY OF MINNESOTA, MORRIS

Curriculum Committee Form B: Discipline Objectives and Requirements

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All changes become effective the fall semester following Campus Assembly approval.

Date: Sept 3, 2004
Discipline/Division: Mathematics/Division of Science and Mathematics

I. Introductory Statement: no change

II. Objectives: The mission of the discipline is to advance knowledge of mathematics: by *teaching* mathematics and its processes, by *research* in mathematics and mathematical pedagogy, and by *dissemination* of this knowledge to students and the community we serve.

Historically, the study of mathematics has been central to a liberal arts education. The mathematics curriculum serves as an integral part of students' active pursuit of a liberal arts education. ~~The discipline's mission concentrates on the three main components of the institutional mission, namely, teaching, research, and outreach.~~ The mathematics program serves students who major or minor in mathematics, seek secondary mathematics teaching licensure, major or minor in programs that require a mathematical background, or wish to fulfill components of a general education. ~~The mathematics faculty provide guidance to students who choose to design their own major/minor. The discipline's mission includes dissemination of mathematical knowledge to the community.~~

The mathematics curriculum is designed to help students develop competence in mathematical techniques and methods; to sharpen students' mathematical intuition and abstract reasoning as well as their reasoning from numerical data; to encourage and stimulate the type of independent thinking required for research beyond the confines of the textbook; and to provide students with the basic knowledge and skills to make mathematical contributions to modern society and effectively disseminate mathematical knowledge to the community. ~~The mathematics curriculum is designed to help students develop competence in mathematical techniques and methods. It aims to sharpen the students' mathematical intuition and abstract reasoning as well as their reasoning from numerical data. It also encourages and stimulates the type of independent thinking required for research beyond the confines of the textbook. The mathematics program aims to provide students with the basic knowledge and skills to make mathematical contributions to modern society, whether in the form of pure mathematics or of mathematics applied in other disciplines.~~ The program seeks to enable students to see and communicate how the development of mathematics has been part of the development of several civilizations and is intimately interwoven with the cultural and scientific development of these societies. The curriculum prepares students to enter graduate school, pursue careers in applied mathematics, or teach mathematics.

~~The discipline uses various assessment methods and tools to evaluate and improve student academic achievement in mathematics. The results of the assessment help the discipline to shape a curriculum that is responsive to student needs. The Mathematics Major/Minor Student Portfolio is the major assessment tool used by the discipline. It includes characteristics of the entering student, documents related to the learning development of the student during his or her stay at UMM, and post-graduation information. Some other assessment methods and tools include proficiency tests in basic skills courses, performance in course projects, and specially designed exams in some courses. Graduates of the program are surveyed regularly to assess discipline objectives.~~

III. Assessment:

IV. Requirements for a Major:

Math 1101-1102-2101—Calculus I-II-III
Math 2111—Linear Algebra
Math 2202—Mathematical Perspectives
Math 3221—Analysis
Math 3231—Abstract Algebra I
Math 4901—Senior Seminar
Stat 2611—Mathematical Statistics
one course numbered Math x4xx
a minimum of 5 additional credits in Math courses at 2xxx or above

Students also are required to take a course with significant mathematical applications outside the mathematics discipline. This course must be approved by the mathematics discipline. Courses which meet this requirement are listed online at <www.mrs.umn.edu/academic/math/app-require.html>.

Required courses may not be taken S-N unless offered S-N only. Up to 6 credits of coursework with a grade of D may be used to meet the major requirements if offset by an equivalent number of credits of A or B.

Majors should begin with Math 1011—Pre-Calculus or Math 1101—Calculus I. Students with questions about placement are encouraged to discuss them with members of the mathematics faculty.

Recommended ~~courses~~ electives for students planning to pursue graduate work in *pure mathematics* are:
Math 4201—Complex Analysis
Math 4211—Real Analysis
Math 4221—Topology
Math 4231—Abstract Algebra II
Math 4241—Number Theory
Math 4252—Differential Geometry
Math 4253—Combinatorics

~~The r~~Recommended electives for students planning to work or pursue graduate work in *applied mathematics* or related fields are:
Math 2401—Differential Equations
Math 3401—Operations Research
Math 3411—Discrete and Combinatorial Mathematics
Math 4401—Numerical Methods with Applications in Mathematical Modeling
~~Math 4450—Variable Topics in Applied Mathematics~~
Math 4452—Mathematical Modeling

V. Requirements for a Minor:

Math 1101-1102—Calculus I-II
Math 2111—Linear Algebra
a minimum of 12 additional credits in Math courses at 2xxx or above in at least two of the following numbering systems x2xx, x4xx, x5xx, ~~or~~ Stat 2611, or Math 2101

Required courses may not be taken S-N unless offered S-N only. Up to 6 credits of coursework with a grade of D may be used to meet the minor requirements if offset by an equivalent number of credits of A or B.

VI. Requirements for Teacher Preparation: no change

VII. Other heading (include heading title) : no change