



BACHELOR OF SCIENCE MATHEMATICS

Catalog year Fall 2009 and later

The program requires 8-10 400-level courses in mathematics including at least 12 credits taken for a grade at Illinois; a computer programming course; and at least 12 hours of approved supporting coursework in an area outside of mathematics but using mathematical methods. Each student must fulfill BOTH the requirements of the CORE program and the requirements of one of the five CONCENTRATIONS.

THE CORE – required of all students

- Math 241 _____ (Calculus)
- CS 101 or CS 125 _____ (Computer Programming)
- Math 347 or 348 _____ (Fundamental Mathematics)
- Math 416 _____ (Linear Algebra)
- Math 417 or 427 _____ (Abstract Algebra)
- Math 461 or 463 _____ (Probability or Statistics)
- Math 444 or 447 or 424 _____ (Real Analysis)
- Any minor or at least 12 hours of approved supporting coursework

CONCENTRATION 1: GENERAL MATHEMATICS

- Two courses chosen from two of the following lists:
Math 402, 403, 423, 481 _____ (Geometry)
Math 441, 446, 448 _____ (Differential Equations or Complex Analysis)
Math 453 _____ (Number Theory)
- Two additional 400-level Mathematics courses

CONCENTRATION 2: GRADUATE PREPARATORY

- Math 447 or 424; Math 448 _____ (Real & Complex Analysis)
- Math 441 _____ (Differential Equations)
- Math 423 or 425 or 432 _____ (Differential Geometry or Topology)
- Math 418 or 428 _____ (Abstract Algebra II or Honors Topics Course)
- Two additional 400-level Mathematics courses

The courses chosen from the core and the honors concentration above must include at least two of the following:

- Math 424, Math 425, Math 427, Math 428.

CONCENTRATION 3: APPLIED MATHEMATICS

- Math 441 _____ (Differential Equations I)
- Math 446 or 448 _____ (Complex Analysis)
- One of the three courses
Math/CS 357 _____ (Numerical Methods)
Math 442 _____ (Introduction to Partial Differential Equations)
Math 489 _____ (Differential Equations II)
- At least one of Math 412, 413, 482 _____ (Discrete Mathematics)
- One additional 400-level Mathematics course

CONCENTRATION 4: OPERATIONS RESEARCH

- Math/CS 357 _____ (Numerical Methods)
- Math 463 and either 464 or 469 _____ (Statistics)
- Math 482 _____ (Optimization)
- Math 412 or 484 _____ (Graph Theory or Nonlinear Programming)

CONCENTRATION 5: TEACHER EDUCATION For this option, described on a different balance sheet, students are admitted to a teacher education minor and need not do other supporting coursework.

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GENERAL EDUCATION REQUIREMENTS

Lists of courses satisfying the requirements are available on the Web: <http://courses.illinois.edu>

Students in the Teacher Education Concentration must satisfy the general education requirements of LAS and take a speech performance course.

Language other than English _____

Composition I and Advanced Composition _____

Humanities and the Arts

(includes Literature & Arts, Historical & Philosophical Perspectives) _____ (6 hours)

Social and Behavioral Sciences

(includes Social Science, Behavioral Science) _____ (6 hours)

Natural Sciences and Technology

(includes Physical Sciences, Life Sciences) _____ (6 hours)

Western/Comparative Cultures _____ (1 course)

Nonwestern/US Minority Cultures _____ (1 course)

Guidelines to Self-advising for Mathematics Majors

Don't!

See an advisor for help. However, you can make some plans on your own. The LAS website <http://www.las.illinois.edu/students/requirements/> contains a wealth of information on graduation requirements. The Undergraduate Mathematics website, <http://www.math.uiuc.edu/UndergraduateProgram/> contains links to many useful sites. Your DARS audit at <http://registrar.illinois.edu/dars> shows your progress toward graduation.

It is ultimately the student's responsibility to meet all graduation requirements: Mathematics, Composition, General Education, Hours, GPA, Residency, and Advanced Hours. However, your advisor, the Undergraduate Office in 313 Altgeld, and your records officer in the LAS college office will help in any way they can. Check with them often.

Math 347 can be taken concurrently with 241. A grade lower than B in a calculus class or Math 347 should be taken as a warning of potential problems in upper level courses. **The proper sequencing of courses at the 400 level depends upon your ability and mathematical maturity.** Although different upper level courses may have the same prerequisites, their level of difficulty can be radically different. It is best to speak to an advisor. Some suggestions: For the first 400-level course, Math 402, 403, 416, 461, and 463 are good choices. Math 444 or 447 should be taken after one or more 400-level courses have been completed. Students with A's in their preceding courses should consider taking Math 447 rather than 444. A student can construct a very high quality program by sticking as closely as possible to the Graduate Preparatory option. Similarly, the Operations Research option can serve as a guide for students interested in industrial engineering applications. The department offers a variety of other courses at the undergraduate level not mentioned above that it encourages you to explore; some examples are Combinatorics (413), Logic (414), and History of Calculus (406). Very strong students should consult with the Director of Undergraduate Studies about taking courses in the Honors Sequence, Math 424-428, or graduate math courses. All students are encouraged to take more than the minimum of science and computer based courses.

The choice of supporting coursework depends upon your interests and professional goals. Any minor or second major will fulfill the requirement. Some possibilities are given below. It would be wise to consult both with your

math advisor and with an advisor in the specialty. Supporting coursework must be in a single area and cannot include courses cross-listed with Math.

Physics	211, 212, 213, 214
Economics	102, 103, 302, 465 (see also 471)
Philosophy	102 or 103, 202, 270, 317, 318 (any 12 hours)
Computer Science	Any 12 hours of courses different from CS 101 and 125 and not cross-listed with Math.

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