



Mathematics - B.S.

College of Arts and Sciences

The department offers two programs leading to the B.A. or B.S. degree. Students may major in mathematics by completing the requirements for either: Option A, Mathematics or Option B, Mathematical Sciences.

The mathematics option consists of courses offered solely by the department of mathematics and is intended for those who wish to follow a traditional mathematics career path. The mathematical sciences option consists of courses offered by the departments of computer science, mathematics and statistics, and is intended for those who opt for a career that requires the application of mathematics. The requirements for these programs are outlined below.

120 hours (minimum)

Any student earning a Bachelor of Science (BS) degree must complete a minimum of 60 hours in natural, physical, mathematical, and computer science. A complete description of College requirements for a Bachelor of Science degree, including a specific listing of courses applicable to the 60-hour requirement, can be found on page 96 of the 2004-2005 UK Bulletin.

University Studies Program Requirements

- I. Math (completed by Premajor Requirement)
II. Foreign Language (placement exam recommended)
III. Inference-Logic (completed by Premajor Requirement)
IV. Written Communication
V. Oral Communication
VI. Natural Sciences
VII. Social Sciences
VIII. Humanities
IX. Cross-Cultural (choose a Humanities course)
X. Electives (choose one Social Science and one Natural Science course)

USP hours: 33-44

College Requirements

- I. Foreign Language (placement exam recommended)
II. Disciplinary Requirements
a. Natural Science (completed by USP Elective Requirement)
b. Social Science (completed by USP Elective Requirement)
c. Humanities (completed by USP Cross-Cultural Requirement)
III. Laboratory or Field Work
IV. Electives

College Requirement hours: 6-14

OPTION A - Mathematics

Premajor Requirements

- ^MA 113 Calculus I
MA 114 Calculus II
CS 115 Introduction to Computer Programming

Premajor hours: 11

Major Requirements

Major Core Requirements

- MA 213 Calculus III
MA 214 Calculus IV
MA 322 Matrix Algebra and its Applications

Major Core hours: 10

Other Course Work Required for the Major

From the Major Department:

Choose 18 hours of 300+ level mathematics courses. One of the following sequences, or a substitute approved by the Director of Undergraduate Studies, must be included: MA 351/352, MA 361/362, MA 471G/472G, MA 481G/483G, CS/MA 321/422, CS/MA 416G and MA/STA 417G, MA 433G/485G; at least 2 of the following must be included (they can also count as the sequence if appropriate): MA 351, 352, 361, 362, 471G, 472G. May not include MA 322

From Outside the Major Department

Choose 14 hours outside Mathematics at the 300+ level. Courses are generally chosen from physics, chemistry, biology, logic, statistics, computer science, economics, and engineering. 200+ level courses used to satisfy USP and College requirements can also be counted here

Other Major hours: 32

OPTION B - Mathematical Sciences

Premajor Requirements

- ^MA 113 Calculus I
MA 114 Calculus II
CS 115 Introduction to Computer Programming
CS 215 Introduction to Program Design, Abstraction and Problem Solving

Premajor hours: 15

Major Requirements

Major Core Requirements

- MA 213 Calculus III
MA 214 Calculus IV
CS 216 Introduction to Software Engineering
STA 281 Probability and Statistics Using Interactive Computer Techniques
MA/STA 320 Introductory Probability
CS/MA 321 Introduction to Numerical Methods
STA 321 Basic Statistical Theory I
MA 322 Matrix Algebra and its Applications
CS/MA 416G Principles of Operations Research I
STA 422G Basic Statistical Theory II

Major Core hours: 31

# Mathematics (B.S.) • 2

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## Other Course Work Required for the Major

### From the Major Department:

Choose one of the following: MA 361, MA 433G, MA 471G ..... 3

Choose 9 hours of 300+ level mathematics courses. One of the following sequences, or a substitute approved by the Director of Undergraduate Studies, must be included: MA 481G/483G, CS/MA 321/422, CS/MA 416G and MA/STA 417G, CS 315/450G. A substitute sequence may be approved upon petition by the student to the Director of Undergraduate Studies. Approved courses in the mathematical sciences include those courses in computer science, engineering mechanics, mathematics, and statistics which are not of a service nature ..... 9

### From Outside the Major Department

Choose 9 hours outside Mathematics at the 300+ level. 200+ level courses used to satisfy USP and College requirements can also be counted here ..... 9

**Other Major hours:** ..... **21**

## Electives

Electives should be selected by the student to lead to the minimum total of 120 hours required for graduation ..... 0-9

**Total Minimum Hours Required for Degree** ..... **120**

*^Course used towards completion of a USP or College Requirement.*

## Mathematics Cooperative Education

Qualified students who major in mathematics may participate in the Mathematical Sciences Cooperative Education Program which provides the opportunity for alternate semesters of academic study and full-time employment in business or industry. Guidelines and application forms are available in the Engineering/Math Sciences Co-op Program Office, 320 Robotics Building.