Mathematics - B.S.

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 111 of the 2010-2011 UK Bulletin.

University Studies Program Requirements
I. Math (completed by Premajor Requirement) ......................................................... 4
II. Foreign Language (placement exam recommended) .............................................. 0-8
III. Inference–Logic (completed by Premajor Requirement) .................................. 0-4
IV. Written Communication ...................................................................................... 3
V. Oral Communication ............................................................................................ 3
VI. Natural Sciences .................................................................................................. 6
VII. Social Sciences ................................................................................................. 6
VIII. Humanities ..................................................................................................... 6
IX. Cross-Cultural (choose a Humanities course) ................................................... 3
X. Electives (choose one Social Science and one Natural Science course) .............. 6

USP hours: ............................................................................................................. 30-42

Graduation Writing Requirement
After attaining sophomore status, students must complete a Graduation Writing Requirement course. See "University Writing Requirement" on pages 78-79 of the 2010-2011 UK Bulletin.

Graduation Writing Requirement Hours: ........................................................... 3

College Requirements
I. Foreign Language (placement exam recommended) .............................................. 0-8
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 .................................................................................. 1
IV. Electives ............................................................................................................ 6

College Requirement hours: .................................................................................. 6-14

OPTION A - Mathematics

Premajor Requirements
^MA 113 Calculus I .................................................................................................. 4
MA 114 Calculus II ................................................................................................... 4
CS 115 Introduction to Computer Programming ...................................................... 3
Premajor hours: ...................................................................................................... 11

Major Requirements
Major Core Requirements
MA 213 Calculus III .................................................................................................. 4
MA 214 Calculus IV or
MA 261 Introduction to Number Theory ................................................................ 3
MA 322 Matrix Algebra and its Applications .......................................................... 3
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 416G and MA/STA 417G; at least two 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. .......................................................................................... 18

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 ........................................ 14

Other Major hours: .................................................................................................. 32

OPTION B - Mathematical Sciences

Premajor Requirements
^MA 113 Calculus I .................................................................................................. 4
MA 114 Calculus II ................................................................................................... 4
CS 115 Introduction to Computer Programming ...................................................... 3
CS 215 Introduction to Program Design, Abstraction and Problem Solving .......... 4
Premajor hours: ...................................................................................................... 15

College Requirement hours: .................................................................................... 6-14

2010-2011 Series
Major Requirements

Major Core Requirements
MA 213 Calculus III ................................................................. 4
MA 214 Calculus IV ................................................................. 3
CS 216 Introduction to Software Engineering ......................... 3
STA 281 Probability and Statistics Using Interactive
  Computer Techniques ......................................................... 3
MA/STA 320 Introductory Probability ....................................... 3
CS/MA 321 Introduction to Numerical Methods ....................... 3
STA 321 Basic Statistical Theory I .......................................... 3
MA 322 Matrix Algebra and its Applications ......................... 3
STA 422G Basic Statistical Theory II ..................................... 3

Major Core hours: .................................................................... 31

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 Math-
ematical Sciences Cooperative Education Program which provides the
opportunity for alternate semesters of academic study and full-time employ-
ment in business or industry. Guidelines and application forms are available
in the Engineering/Math Sciences Co-op Program Office, 320 Robotics
Building.