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, is in the *Arts and Sciences* section of the *2022-2023 Undergraduate Bulletin*.

UK Core Requirements

See the *UK Core* section of the *2022-2023 Undergraduate Bulletin* for the complete UK Core requirements. The courses listed below are (a) recommended by the college, or (b) required courses that also fulfill UK Core areas. Students should work closely with their advisor to complete the UK Core requirements.

I. Intellectual Inquiry in Arts and Creativity
Choose one course from approved list..3

II. Intellectual Inquiry in the Humanities
Choose one course from approved list..3

III. Intellectual Inquiry in the Social Sciences
Choose one course from approved list..3

IV. Intellectual Inquiry in the Natural, Physical, and Mathematical Sciences
Choose one course from approved list..3

V. Composition and Communication I
CIS/WRD 110 Composition and Communication I 3

VI. Composition and Communication II
CIS/WRD 111 Composition and Communication II 3

VII. Quantitative Foundations
MA 113 Calculus I 4

VIII. Statistical Inferential Reasoning
Choose one course from approved list..3

IX. Community, Culture and Citizenship in the USA
Choose one course from approved list..3

X. Global Dynamics
Choose one course from approved list..3

UK Core hours **31**

Graduation Composition and Communication Requirement (GCCR)

MA 391 Mathematics: Composition and Communication 3

Graduation Composition and Communication Requirement hours (GCCR)..**3**

College Requirements

I. Foreign Language *(placement exam recommended)* 0-14
II. Disciplinary Requirements
    a. Natural Science..3
    b. Social Science 3
    c. Humanities..3
III. Laboratory or Field Work..1
IV. Race and Ethnicity Requirement.. 0-3
V. Electives..6

College Requirement hours: **16-33**

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 College requirements can also be counted here 14

Other Major hours: **32**

OPTION B - Mathematical Sciences

Premajor Requirements

*MA 113 Calculus I
  or
*MA 137 Calculus I with Life Science Applications...4

MA 114 Calculus II
  or
MA 138 Calculus II with Life Science Applications 4

CS 115 Introduction to Computer Programming...3

Premajor hours:.. **11**

Major Requirements

CS 215 Introduction to Program Design, Abstraction
  and Problem Solving..4
MA 213 Calculus III 4
MA 214 Calculus IV 3
MA/STA 320 Introductory Probability 3
MA/CS 321 Introduction to Numerical Methods 3
MA 322 Matrix Algebra and its Applications 3
STA 321 Basic Statistical Theory I 3

plus a two-semester sequence chosen from the following:

MA/CS 340 Applicable Algebra
  and
MA/CS 415G Combinatorics and Graph Theory

MA 432G Methods of Applied Mathematics I
  and
MA 433G Introduction to Complex Variables

MA 481G Differential Equations
  and
MA 483G Introduction to Partial Differential Equations

MA/CS 416G Introduction to Optimization
  and
MA/STA 417G Decision Making Under Uncertainty...6

Major Core hours:.. **29**

Other Course Work Required for the Major

From the Major Department:

Choose six hours of acceptable MA courses at the 300 level and above (MA 308 may not be used)...6

From Outside the Major Department

Nine hour supporting program chosen from one area outside mathematics. The Director of Undergraduate Studies must approve the supporting program. Courses in the supporting program must be at the 300 level and above. Cross-listed courses may be used for the supporting program provided they are not used to satisfy another major requirement 9

Other Major hours: **15**

Electives

Choose electives to lead to the minimum total of 120 hours required for graduation0-9

Total Minimum Hours

Required for Degree.. **120**

Course used towards completion of a UK Core 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.