

Mathematics

Major Requirements for the Bachelor of Arts and Bachelor of Science in Mathematics

To fulfill the Natural Sciences requirement, the Department of Mathematics requires the following:

1. One of the year sequences
 - a) BIOL 002, BIOL 003, BIOL 005C
 - b) CHEM 001A, CHEM 001B, CHEM 001C, CHEM 01LA, CHEM 01LB, CHEM 01LC,
 - c) PHYS 002A, PHYS 002B, PHYS 002C or PHYS 040A, PHYS 040B, PHYS 040C
2. Either one course in the physical sciences listed above if (a) above is completed or one course in the biological sciences if (b) or (c) above is completed.

The major requirements for the B.A. and B.S. degrees in Mathematics are as follows:

For the Bachelor of Arts

1. Lower-division requirements: MATH 008B or MATH 009A, MATH 009B, MATH 009C, MATH 010A, MATH 010B, MATH 046
2. Four (4) units of either CS 010 or one upper-division course in Statistics
3. A minimum of 36 units of upper-division mathematics, excluding courses in the MATH 190–199 series

For the Bachelor of Science

Lower-division requirements for all programs are MATH 008B or MATH 009A, MATH 009B, MATH 009C, MATH 010A, MATH 010B, MATH 046, CS 010 (CS 012 is recommended).

1. Pure Mathematics program (56 units)

- a) Thirty-six (36) units of upper-division mathematics to include at least 24 units from MATH 131, MATH 132, MATH 145A, MATH 145B, MATH 151A, MATH 151B, MATH 151C, MATH 171, MATH 172
- b) At least three courses from (a) above must be from MATH 145A, MATH 145B, MATH 151A, MATH 151B, MATH 151C
- c) Courses in the MATH 190–199 series are excluded

d) Twenty (20) additional units of upper-division mathematics, upper-division computer science, or other related courses approved by the undergraduate advisor (For students who wish to pursue graduate work, courses in complex variables, differential equations, and probability may be particularly useful.)

2. Applied Mathematics programs

MATH 113 or MATH 131, MATH 132, MATH 146A, MATH 146B, MATH 146C and the courses in one of the following options:

- a) Biology option
 - (1) BIOL 005A, BIOL 05LA, BIOL 005B, BIOL 005C
 - (2) MATH 149A
 - (3) Three courses from MATH 120, MATH 121, MATH 135A, MATH 135B, MATH 149B, MATH 149C
 - (4) BIOL 102, BIOL 105, BIOL 108, BIOL 117

(5) Four (4) additional units of upper-division biology

- b) Chemistry option
 - (1) CHEM 001A, CHEM 001B, CHEM 001C, CHEM 01LA, CHEM 01LB, CHEM 01LC
 - (2) Either PHYS 040A, PHYS 040B, PHYS 040C (preferred); or PHYS 002A, PHYS 002B, PHYS 002C

(3) Four courses from MATH 120, MATH 135A, MATH 135B, MATH 149A, MATH 149B, MATH 149C, MATH 165A, MATH 165B

(4) CHEM 110A, CHEM 110B, CHEM 111, CHEM 113

(5) Four (4) additional units of upper-division chemistry

- c) Economics option
 - (1) MATH 120, MATH 121, MATH 149A, MATH 149B, MATH 149C

(2) Five upper-division economics courses (at least 20 units) to consist of ECON 102A and four courses to be chosen from ECON 102B, ECON 103A, ECON 103B, ECON 107, ECON 108, ECON 110, ECON 111, ECON 134/BUS 106, ECON 135, ECON 143A/ENSC 143A, ECON 143B/ENSC 143B, ECON 143C/ENSC 143C, ECON 156, ECON 206

d) Environmental Sciences option

- (1) CHEM 001A, CHEM 001B, CHEM 001C, CHEM 01LA, CHEM 01LB, CHEM 01LC

(2) ECON 006/ENSC 006

(3) GEO 001 is recommended

(4) MATH 149A

(5) Three courses from MATH 120, MATH 121, MATH 135A, MATH 135B, MATH 149B, MATH 149C, CS 177, STAT 155

(6) ENSC 100/SWSC 100, ENSC 101, ENSC 102

(7) Eight (8) additional units of upper-division environmental sciences

e) Physics option

- (1) MATH 135A, MATH 165A, MATH 165B

(2) Either MATH 120 or MATH 171

(3) PHYS 130A, PHYS 130B

(4) Either PHYS 135A, PHYS 135B, PHYS 136 or PHYS 156A, PHYS 156B

f) Statistics option

- (1) MATH 120, MATH 149A, MATH 149B, MATH 149C

(2) Either STAT 130 or STAT 146

(3) STAT 161, STAT 170A, STAT 170B, STAT 171

3. Computational Mathematics program

a) MATH 011/CS 011, MATH 113 or MATH 131, MATH 120, MATH 132, MATH 135A, MATH 135B

b) CS 012, CS 014, CS 141, CS 150

c) One additional CS course to be chosen from the list of approved technical elective courses.

d) Twenty-four (24) units of technical electives to be chosen from

(1) MATH 111/CS 111, MATH 121, MATH 126, MATH 146A, MATH 146B, MATH 146C, MATH 149A, MATH 149B, MATH 149C, MATH 171

(2) CS 130, CS 133, CS 166, CS 170, CS 177

Major Requirements for the Bachelor of Science in Mathematics for Secondary School Teachers

1. Lower-division Mathematics requirements (24 units)

MATH 009A, MATH 009B, MATH 009C, MATH 010A, MATH 010B, MATH 046

2. Upper-division Mathematics requirements (36 units)

a. MATH 131, MATH 133, MATH 140, MATH 144, MATH 153

b. Four courses from: MATH 132, MATH 136, MATH 137, MATH 138A, MATH 145A, MATH 145B, MATH 149A, MATH 149B, MATH 149C, MATH 151A, MATH 151B, MATH 151C, MATH 171, MATH 172

3. Additional Mathematics and related disciplines requirements (12 units)
 - a. CS 010
 - b. CS 011/MATH 011
 - c. STAT 155
4. Natural Sciences (16-20 units)
 - a. BIOL 002 or BIOL 003 or BIOL 005A and BIOL 05LA
 - b. CHEM 001A and CHEM 01LA or CHEM 001HA and CHEM 1HLA
 - c. PHYS 002A or PHYS 040A
 - d. CHEM 001B and CHEM 01LB or CHEM 001HB and CHEM 1HLB or PHYS 002B or PHYS 040Bor an additional laboratory Biological science course
5. Social Sciences (16 units)
 - a. One course in ECON or POSC
 - b. One course in ANTH
 - c. One course in PSYC
 - d. One course in SOC
6. Mathematics Education and Education requirements (18 or 19 units):
EDUC 104/MATH 104, EDUC 003 or EDUC 004 or EDUC 100B or equivalent, EDUC 109, EDUC 110, EDUC 139
7. Recommended Courses
LING 020 or LING 021, EDUC 116, EDUC 174, EDUC 177A

Minor

The following are the requirements for a minor in Mathematics.

1. Lower-division courses (20 units):
MATH 008B or MATH 009A, MATH 009B, MATH 009C, MATH 010A, MATH 010B
2. Upper-division requirements:
24 units of upper-division mathematics courses. Of the specified upper-division units, a minimum of 16 must be unique to the minor and may not be used to satisfy major requirements and no more than 4 units in courses numbered 190–199.
Students with a minor in Mathematics should consult with a faculty advisor in Mathematics to construct a specific program consistent with their goals.

See Minors under the College of Natural and Agricultural Sciences in the Colleges and Programs section of this catalog for additional information on minors.