

## Mathematics BS – Sample Programs of Study

The following are examples of *just a few* possibilities. The first example shows that nothing has really changed; a degree identical to what we already offer can still be earned. The remaining examples highlight the focus a student might wish to follow.

The flexibility of the (increased) 42 credits of electives permits mathematics majors to be highly specialized (mathematical sciences) or interdisciplinary (one or more other disciplines).

### **Example 1: Preparation for Graduate Studies in the Mathematical Sciences**

#### **GERs (35 credits)**

*Includes 8 credits of Physics*

#### **Major Requirements (43 credits)**

MATH S251 Calculus I (4 credits)

MATH S252 Calculus II (4 credits)

MATH S253 Calculus III (4 credits)

MATH S265 Introduction to Mathematical Proofs (3 credits)

MATH S302 Differential Equations (3 credits)

MATH S311 Modern Algebra (3 credits)

MATH S314 Linear Algebra I (3 credits)

MATH S324 Advanced Calculus (3 credits)

MATH S392 Junior Seminar (2 credits)

MATH S492 Senior Seminar (2 credits)

STAT S200 Elementary Statistics (3 credits)

MATH S410 Complex Variables (3 credits)

MATH S460 Mathematical Modeling (3 credits)

STAT S373 Probability and Statistics (3 credits)

#### **Electives/Minor/Double Major (42 credits)**

Additional UAS or exchange/transfer upper division mathematics and/or statistics courses – 15 credits

Selected lab courses in the sciences – 12 credits

Additional interdisciplinary electives involving the use of technology – 15 credits

Possibilities include GIS courses from ENV5/GEOG and/or programming courses from CIS.

**Total credits – 120**

## Mathematics BS – Sample Programs of Study

### Example 2: Preparation for Secondary School Teaching

#### **GERs (35 credits)**

*Includes 8 credits of Physics*

**and Social Science GER** – PSY 101 and PSY 250

#### **Major Requirements (43 credits)**

MATH S251 Calculus I (4 credits)

MATH S252 Calculus II (4 credits)

MATH S253 Calculus III (4 credits)

MATH S265 Introduction to Mathematical Proofs (3 credits)

MATH S302 Differential Equations (3 credits)

MATH S311 Modern Algebra (3 credits)

MATH S314 Linear Algebra I (3 credits)

MATH S324 Advanced Calculus (3 credits)

MATH S392 Junior Seminar (2 credits)

MATH S492 Senior Seminar (2 credits)

STAT S200 Elementary Statistics (3 credits)

MATH S305 Geometry (3 credits)

MATH S411 History of Mathematics (3 credits)

MATH S460 Mathematical Modeling (3 credits)

#### **Electives/Minor/Double Major (42 credits)**

Selected Psychology courses – 15 credits

Selected Education courses – 9 credits

Science and Social Science courses – 18 credits

BIOL S105 Fundamentals of Biology (4 credits)

CHEM S105 General Chemistry I (4 credits)

CIS S105 Computer Literacy (3 credits)

ECON S202 Principles of Microeconomics (3 credits)

ENVS S102 Earth and the Environment (4 credits)

**Total credits – 120**

## Mathematics BS – Sample Programs of Study

### **Example 3: Double Major with Biology**

#### **GERs (35 credits)**

*Includes 8 credits of Physics*

#### **Major Requirements (43 credits)**

MATH S251 Calculus I (4 credits)  
MATH S252 Calculus II (4 credits)  
MATH S253 Calculus III (4 credits)  
MATH S265 Introduction to Mathematical Proofs (3 credits)  
MATH S302 Differential Equations (3 credits)  
MATH S311 Modern Algebra (3 credits)  
MATH S314 Linear Algebra I (3 credits)  
MATH S324 Advanced Calculus (3 credits)  
MATH S392 Junior Seminar (2 credits)  
MATH S492 Senior Seminar (2 credits)  
STAT S200 Elementary Statistics (3 credits)

MATH S460 Mathematical Modeling (3 credits)  
STAT S400 Statistical Computing with R (2 credits)  
STAT S401 Regression and Analysis of Variance (4 credits)

#### **Biology Major (60 credits)**

BIOL S105 and BIOL S106 – 8 credits

Biology Major Requirements (32 credits)

*Excludes STAT S200 and 8 Physics credits (covered for Math BS)*

Biology Breadth Electives (20 credits)

Electives (0 credits needed)

*Covered by Math BS major requirements*

**Total credits – approximately  $120 + 18 = 138$**

Note: Total credits may be a little higher or a little lower.

## Mathematics BS – Sample Programs of Study

### **Example 4: Double Major with Marine Biology**

#### **GERs (35 credits)**

*Includes 8 credits of Physics*

#### **Major Requirements (43 credits)**

MATH S251 Calculus I (4 credits)  
MATH S252 Calculus II (4 credits)  
MATH S253 Calculus III (4 credits)  
MATH S265 Introduction to Mathematical Proofs (3 credits)  
MATH S302 Differential Equations (3 credits)  
MATH S311 Modern Algebra (3 credits)  
MATH S314 Linear Algebra I (3 credits)  
MATH S324 Advanced Calculus (3 credits)  
MATH S392 Junior Seminar (2 credits)  
MATH S492 Senior Seminar (2 credits)  
STAT S200 Elementary Statistics (3 credits)

MATH S460 Mathematical Modeling (3 credits)  
STAT S400 Statistical Computing with R (2 credits)  
STAT S401 Regression and Analysis of Variance (4 credits)

#### **Marine Biology Major (60 credits)**

BIOL S105 and BIOL S106 (8 credits)

Marine Biology Major Requirements (35 credits)

*Excludes STAT S200 and 8 Physics credits (covered for Math BS)*

Marine Biology core courses (11 credits)

Biology Breadth Electives (6 credits)

Electives (0 credits needed)

*Covered by Math BS major requirements*

**Total credits – approximately  $120 + 18 = 138$**

Note: Total credits may be a little higher or a little lower.

## Mathematics BS – Sample Programs of Study

### **Example 5: Double Major with Environmental Science**

#### **GERs (35 credits)**

*Includes 8 credits of Physics*

#### **Major Requirements (43 credits)**

MATH S251 Calculus I (4 credits)  
MATH S252 Calculus II (4 credits)  
MATH S253 Calculus III (4 credits)  
MATH S265 Introduction to Mathematical Proofs (3 credits)  
MATH S302 Differential Equations (3 credits)  
MATH S311 Modern Algebra (3 credits)  
MATH S314 Linear Algebra I (3 credits)  
MATH S324 Advanced Calculus (3 credits)  
MATH S392 Junior Seminar (2 credits)  
MATH S492 Senior Seminar (2 credits)  
STAT S200 Elementary Statistics (3 credits)

MATH S460 Mathematical Modeling (3 credits)  
STAT S400 Statistical Computing with R (2 credits)  
STAT S401 Regression and Analysis of Variance (4 credits)

#### **Environmental Science Major (53 credits)**

BIOL S105 and ENVS S102 (8 credits)

Environmental Sciences Major Requirements (27 credits)  
*Excludes STAT S200 and 8 Physics credits (covered for Math BS)*

Quantitative and Spatial Analysis (0 credits needed)  
*Covered by Math BS major requirements*

Concentration Areas (18 credits)

Electives (0 credits needed)  
*Covered by Math BS major requirements*

**Total credits – 120 + 11 = 131**

Note: Total credits may be a little higher or a little lower.

## Mathematics BS – Sample Programs of Study

### **Example 6: Double Major with Geography and Environmental Resources**

#### **GERs (35 credits)**

*Includes 8 credits of Physics*

**and Social Science GER GEOG S101**

#### **Major Requirements (43 credits)**

MATH S251 Calculus I (4 credits)

MATH S252 Calculus II (4 credits)

MATH S253 Calculus III (4 credits)

MATH S265 Introduction to Mathematical Proofs (3 credits)

MATH S302 Differential Equations (3 credits)

MATH S311 Modern Algebra (3 credits)

MATH S314 Linear Algebra I (3 credits)

MATH S324 Advanced Calculus (3 credits)

MATH S392 Junior Seminar (2 credits)

MATH S492 Senior Seminar (2 credits)

STAT S200 Elementary Statistics (3 credits)

MATH S460 Mathematical Modeling (3 credits)

STAT S400 Statistical Computing with R (2 credits)

STAT S401 Regression and Analysis of Variance (4 credits)

#### **Geography and Environmental Resources Major (54 credits)**

BIOL S105 and GEOL S104 (8 credits)

Major Requirements (46)

*Use Mathematics BS major requirements toward 10 credits of Geographic Analysis*

Electives (0 credits needed)

*Covered by Math BS major requirements*

**Total credits – 120 + 12 = 132**

Note: Total credits may be a little higher or a little lower.

## Mathematics BS – Sample Programs of Study

### **Example 7: Interest in Business and Economics**

#### **GERs (35 credits)**

*Includes 8 credits of Physics*

**and Social Science GER** ECON S201 and ECON S202

#### **Major Requirements (43 credits)**

MATH S251 Calculus I (4 credits)

MATH S252 Calculus II (4 credits)

MATH S253 Calculus III (4 credits)

MATH S265 Introduction to Mathematical Proofs (3 credits)

MATH S302 Differential Equations (3 credits)

MATH S311 Modern Algebra (3 credits)

MATH S314 Linear Algebra I (3 credits)

MATH S324 Advanced Calculus (3 credits)

MATH S392 Junior Seminar (2 credits)

MATH S492 Senior Seminar (2 credits)

STAT S200 Elementary Statistics (3 credits)

MATH S460 Mathematical Modeling (3 credits)

STAT S400 Statistical Computing with R (2 credits)

STAT S401 Regression and Analysis of Variance (4 credits)

#### **Electives plus Economics and Business Minors (42 credits)**

Economics Minor (12 credits)

Business Minor (15 credits)

*Additional upper division coursework in statistics, economics, business, accounting, and computer information systems (15 credits)*

**Total credits – 120**

## Mathematics BS – Sample Programs of Study

### **Example 8: Interest in Social Sciences**

#### **GERs (35 credits)**

*Includes 8 credits of Physics*

**and Social Science GER ANTH S101 and ANTH S102**

#### **Major Requirements (43 credits)**

MATH S251 Calculus I (4 credits)  
MATH S252 Calculus II (4 credits)  
MATH S253 Calculus III (4 credits)  
MATH S265 Introduction to Mathematical Proofs (3 credits)  
MATH S302 Differential Equations (3 credits)  
MATH S311 Modern Algebra (3 credits)  
MATH S314 Linear Algebra I (3 credits)  
MATH S324 Advanced Calculus (3 credits)  
MATH S392 Junior Seminar (2 credits)  
MATH S492 Senior Seminar (2 credits)  
STAT S200 Elementary Statistics (3 credits)

MATH S460 Mathematical Modeling (3 credits)  
STAT S400 Statistical Computing with R (2 credits)  
STAT S401 Regression and Analysis of Variance (4 credits)

#### **Anthropology and Geography Electives (42 credits)**

ANTH S211 Fundamentals of Archeology (3 credits)  
ANTH S311 Methods and Theories in Archeology (3 credits)  
ANTH S312 Humans and the Environment (3 credits)  
ANTH S314 Archeology of Southeast Alaska (3 credits)  
  
GEOG S102 Earth and Environment (4 credits)  
GEOG S110 Introduction to ArcGIS (1 credit)  
GEOG S210 Temperate Rainforest Ecosystems (3 credits)  
GEOG S212 Natural Hazards (3 credits)  
GEOG S309 Mobile GIS Technology and Applications (2 credits)  
GEOG S338 Introduction to GIS (3 credits)  
GEOG S406 Remote Sensing (3 credits)  
GEOG S409 Projects in GIS and Remote Sensing (3 credits)  
GEOG S410 Advanced Geographic Information Systems (3 credits)  
GEOG S415 Biogeography and Landscape Ecology (3 credits)  
GEOG S491 Geography Internship (2 credits)

**Total credits – 120**



## Mathematics BS – Sample Programs of Study

### **Example 9: BS in Mathematics plus a second BA or BBA degree**

#### **GERs (35 credits)**

*Includes 8 credits of Physics*

**and** appropriate selection of Humanities and Social science GER courses

#### **Major Requirements (43 credits)**

MATH S251 Calculus I (4 credits)

MATH S252 Calculus II (4 credits)

MATH S253 Calculus III (4 credits)

MATH S265 Introduction to Mathematical Proofs (3 credits)

MATH S302 Differential Equations (3 credits)

MATH S311 Modern Algebra (3 credits)

MATH S314 Linear Algebra I (3 credits)

MATH S324 Advanced Calculus (3 credits)

MATH S392 Junior Seminar (2 credits)

MATH S492 Senior Seminar (2 credits)

STAT S200 Elementary Statistics (3 credits)

Appropriate Upper division MATH/STAT electives (9 credits)

#### **Coursework leading toward second BA or BBA degree (42 credits)**

*Must include upper division credits as needed*

#### **Total credits - 120**

#### **Second Degree – BA or BBA**

Requires a **minimum of 24 additional credits** *beyond* the 120 credits used above for the mathematics BS *and applicable to the BA or BBA degree.*