

Program Change Request

Date Submitted: 10/24/18 1:12 pm

Viewing: **SC-BS-MATH : Mathematics, BS**

Last approved: 03/01/18 10:18 pm

Last edit: 11/12/18 1:41 pm

Changes proposed by: jbazaz

Catalog Pages
Using this Program [Mathematics, BS](#)

In Workflow

1. **MATH Chair**
2. **SC Curriculum Committee**
3. SC Associate Dean
4. SC CAT Editor
5. Assoc Provost- Undergraduate
6. Registrar-Programs

Are you completing this form on someone else's behalf?

Yes

Requestor:

| Name | Extension | Email |
|------------|-----------|--------|
| Igor Griva | 4511 | igriva |

Effective Catalog: 2019-2020

Program Level: Undergraduate

Program Type: Bachelor's

Degree Type: Bachelor of Science

Title: Mathematics, BS

Banner Title: **Mathematics, BS**

Registrar/OAPI Use Only – SCHEV Status Approved

Registrar's Office Use Only – Program Start Term

Registrar/OAPI Use Only – SCHEV Letter

Concentration(s):

Approval Path

1. 11/12/18 12:23 pm
David Walnut
(dwalnut):
Approved for MATH Chair

History

1. Nov 21, 2017 by
clmig-jwehrheim
2. Nov 21, 2017 by
clmig-jwehrheim
3. Jan 17, 2018 by
Rebekah Zacharias
(rzachari)
4. Feb 7, 2018 by
Rebekah Zacharias
(rzachari)
5. Mar 1, 2018 by
Jennifer Bazaz
Gettys (jbazaz)

| | Associated Concentrations | Registrar's Office Use Only: Concentration Code |
|---|---------------------------|---|
| 1 | Actuarial Mathematics | ACTM |
| 2 | Applied Mathematics | AMT |
| 3 | Mathematical Statistics | MTHS |

Registrar/IRR Use Only – Concentration CIP Code

College/School: College of Science

Department / Academic Unit: Mathematical Sciences

Jointly Owned Program? No

Justification
Adding option of having a biology science sequence to BS in mathematics.
The Department of Mathematical Sciences would like to add a biology sequence to the acceptable science sequences for the BS degree. The allowable sequence would be BIOL 213: Cell Biology (4 credits including lab), followed by one of the following: BIOL 311: Genetics (4 credits including lab), BIOL 308: Ecology and Evolution (5 credits including lab), or BIOL

310/330: Biodiversity lecture and lab (5 credits). BIOL 311, 308, and 310/330 require BIOL 213 as a prerequisite but do not have to be taken in a specific order after BIOL 213.

All of these courses are taken by majors in Biology, and BIOL 213 is taken by all Neuroscience majors and by Biology minors. None of these courses, including BIOL 213, can be replaced by AP or IB credits.

Adding the science sequence in Biology would accomplish several goals. Firstly, it would make official a course substitution that has been allowed informally in the past. Secondly, it would formally offer math majors an additional rigorous possibility for completing their science requirement. Finally, a mathematically inclined student ultimately interested in a career in biomedical sciences would be well-served by a rigorous biology sequence.

Also, the Society of Actuaries has introduced a new required exam: Statistics for Risk Modeling. The Department of Mathematical Sciences would like to modify the required course sequence for Concentration in Actuarial Mathematics to reflect the changes in SOA exam requirements. Also, we would like to add MATH 125 to the list of required courses. The material covered in the course is fundamental. The concentration in Actuarial Mathematics is the only track of BS in Math that that currently does not require MATH 125.

Total Credits Required: Total credits: minimum 120

Registrar's Office Use Only - Program Code:
SC-BS-MATH

Registrar/IRR Use Only – Program CIP Code

Admission Requirements:

Admissions

University-wide admissions policies can be found in the [Undergraduate Admissions Policies](#) section of this catalog.

To apply for this program, please complete the [George Mason University Admissions Application](#).

Program-Specific Policies:

Policies

Students must fulfill all [Requirements for Bachelor's Degrees](#), including the [Mason Core](#).

[MATH 290](#) Introduction to Advanced Mathematics meets the writing intensive requirement for this major.

For policies governing all undergraduate programs, see [AP.5 Undergraduate Policies](#).

Graduating seniors are required to have an exit interview.

Language Proficiency Recommendation

The department recommends proficiency in French, German, or Russian.

Course Recommendations and Policies

A maximum of 6 credits of grades below 2.00 in coursework designated MATH or STAT may be applied toward the major.

Students intending to enter graduate school in mathematics are strongly advised to take [MATH 315](#) Advanced Calculus I and [MATH 321](#) Abstract Algebra.

Students may not receive credit for both [MATH 214](#) Elementary Differential Equations and [MATH 216](#) Theory of Differential Equations; both [MATH 213](#) Analytic Geometry and Calculus III and [MATH 215](#) Analytic Geometry and Calculus III (Honors); both [MATH 351](#) Probability and [STAT 344](#) Probability and Statistics for Engineers and Scientists I; and both [MATH 352](#) Statistics and [STAT 354](#) Probability and Statistics for Engineers and Scientists II.

After receiving a grade of 'C' or better in one of the courses listed below on the left, students may not receive credit for the corresponding course on the right:

| Course | MATH credit | May Not Receive Credit for |
|--|--|----------------------------|
| MATH 113 or MATH 123 | MATH 105 or MATH 108 | |
| MATH 351 or STAT 344 | MATH 110 | |
| MATH 441 | MATH 111 | |
| MATH 125 | MATH 112 | |

Degree Requirements:

Students should refer to the [Admissions & Policies](#) tab for specific policies related to this program.

In addition to the mathematics core, science, and computational skills requirements, students may select an optional concentration in Actuarial Mathematics (ACTM), Applied Mathematics (AMT) or Mathematical Statistics (MTHS).

Mathematics Core

| Code | Course List Title | Credits |
|-----------------------------|---|---------|
| MATH 113 | Analytic Geometry and Calculus I (Mason Core) | 4 |
| MATH 114 | Analytic Geometry and Calculus II | 4 |
| MATH 203 | Linear Algebra | 3 |
| MATH 213 | Analytic Geometry and Calculus III | 3 |
| or MATH 215 | Analytic Geometry and Calculus III (Honors) | |
| MATH 214 | Elementary Differential Equations | 3 |
| or MATH 216 | Theory of Differential Equations | |
| MATH 290 | Introduction to Advanced Mathematics 1 | 3 |
| MATH 322 | Advanced Linear Algebra | 3 |
| Total Credits | | 23 |

1 Fulfills the writing intensive requirement.

Science

| Code | Course List Title | Credits |
|---|---|---------|
| Select a one-year sequence of a laboratory science from the following Mason Core Natural Science courses: | | 8-9 |
| Biology Sequence: | | |
| BIOL 213 | Cell Structure and Function (Mason Core) | |
| Choose one from the following: | | |
| BIOL 308 | Foundations of Ecology and Evolution | |
| BIOL 310 | Biodiversity | |
| & BIOL 330 | and Biodiversity Lab and Recitation | |
| BIOL 311 | General Genetics | |
| Chemistry Sequence: | | |
| CHEM 211 | General Chemistry I (Mason Core) | |
| & CHEM 213 | and General Chemistry Laboratory I (Mason Core) | |
| CHEM 212 | General Chemistry II (Mason Core) | |
| & CHEM 214 | and General Chemistry Laboratory II (Mason Core) | |
| Geology Sequence: | | |
| GEOL 101 | Introductory Geology I (Mason Core) | |
| GEOL 102 | Introductory Geology II (Mason Core) | |
| Physics Sequence: | | |
| PHYS 160 | University Physics I (Mason Core) | |
| & PHYS 161 | and University Physics I Laboratory (Mason Core) | |
| PHYS 260 | University Physics II (Mason Core) | |
| & PHYS 261 | and University Physics II Laboratory (Mason Core) | |
| Total Credits | | 8-9 |

Computational Skills

| Code | Course List Title | Credits |
|------------------------|---|---------|
| CS 112 | Introduction to Computer Programming (Mason Core) | 4 |
| Total Credits | | 4 |

BS without Concentration

In addition to the mathematics core, science, and computational skills requirements listed above, students who are not choosing a concentration must complete the following coursework:

| Code | Course List Title | Credits |
|------|----------------------|---------|
|------|----------------------|---------|

| Code | Title | Credits |
|--|---|---------|
| Traditional Mathematics | | |
| MATH 125 | Discrete Mathematics I (Mason Core) | 3 |
| MATH 315 | Advanced Calculus I | 3 |
| MATH 316 | Advanced Calculus II | 3 |
| MATH 321 | Abstract Algebra | 3 |
| or MATH 431 | Topology | |
| Select 12 additional credits of MATH courses numbered above 300 1 | | 12 |
| Additional Science | | |
| Select additional science credits from one of the following three options: | | 4-9 |
| A second sequence from the choices under "Science" above | | |
| 6 credits from more advanced courses in biology, chemistry, geology, or physics 2 | | |
| The 4-credit option of PHYS 262 and PHYS 263 | | |
| Total Credits | | 28-33 |
| 1Excluding MATH 400 History of Math (Topic Varies) (Mason Core) | | |
| 2Only refers to courses acceptable for credit toward a natural science major. Suggested courses include: CHEM 313 Organic Chemistry I through CHEM 332 Physical Chemistry II, CHEM 463 General Biochemistry I, GEOL 302 Mineralogy through GEOL 364 Marine Geology, and PHYS 266 Introduction to Thermodynamics. | | |

Concentration in Actuarial Mathematics (ACTM)

This concentration provides exciting opportunities for students interested in studying actuarial mathematics. Expertise in this field leads directly into a career as a practicing actuary with an insurance company, consulting firm, or in government employment.

| Code | Course List Title | Credits |
|---|--|--------------|
| ACTM Courses | | |
| MATH 125 | Discrete Mathematics I (Mason Core) | 3 |
| MATH 351 | Probability | 3 |
| MATH 352 | Statistics | 3 |
| MATH 551 | Regression and Time Series | 3 |
| MATH 554 | Financial Mathematics | 3 |
| MATH 555 | Actuarial Modeling I | 3 |
| MATH 556 | Actuarial Modeling II | 3 |
| MATH 557 | Financial Derivatives | 3 |
| ACCT 203 | Survey of Accounting | 3 |
| ECON 103 | Contemporary Microeconomic Principles (Mason Core) | 3 |
| ECON 306 | Intermediate Microeconomics 1 | 3 |
| or ECON 310 | Money and Banking | |
| or FNAN 321 | Financial Institutions | |
| STAT 362 | Introduction to Computer Statistical Packages | 3 |
| Select two from the following: | | 6 |
| MATH 441 | Deterministic Operations Research | |
| MATH 442 | Stochastic Operations Research | |
| MATH 446 | Numerical Analysis I | |
| MATH 453 | Advanced Mathematical Statistics | |
| Total Credits | | 39 |
| 1For mathematics majors, the Department of Economics has agreed to waive the ECON 104 Contemporary Macroeconomic Principles (Mason Core) prerequisite | | |

Concentration in Applied Mathematics (AMT)

This concentration provides exciting opportunities for students interested in taking additional classes on applied mathematics. The concentration prepares numerical analysts able to deal with real world applications in science and engineering.

| Code | Course List Title | Credits |
|--------------------------|---|---------|
| AMT Courses | | |
| MATH 125 | Discrete Mathematics I (Mason Core) | 3 |
| MATH 315 | Advanced Calculus I | 3 |
| MATH 351 | Probability | 3 |
| MATH 413 | Modern Applied Mathematics I | 3 |

| Code | Title | Credits |
|---|-------------------------------|---------|
| MATH 414 | Modern Applied Mathematics II | 3 |
| MATH 446 | Numerical Analysis I | 3 |
| Select 6 credits of MATH courses numbered above 300 1 | | 6 |
| Additional Science Courses | | |
| Select additional science credits from one of the following three options: | | 4-9 |
| A second sequence from the choices under "Science" above | | |
| 6 credits from more advanced courses in biology, chemistry, geology, or physics 2 | | |
| The 4-credit option of PHYS 262 and PHYS 263 | | |
| Total Credits | | 28-33 |

1Excluding [MATH 400](#) History of Math (Topic Varies) ([Mason Core](#))

2Only refers to courses acceptable for credit toward a natural science major). Suggested courses include: [CHEM 313](#) Organic Chemistry I through [CHEM 332](#) Physical Chemistry II, [CHEM 463](#) General Biochemistry I, [GEOL 302](#) Mineralogy through [GEOL 364](#) Marine Geology, and [PHYS 266](#) Introduction to Thermodynamics.

Concentration in Mathematical Statistics (MTHS)

This concentration provides exciting opportunities for students interested in taking additional classes on statistics and data analysis. The concentration prepares data analysts able to deal with real world applications in science and engineering.

| Code | Title | Credits |
|---|---|---------|
| MTHS Courses | | |
| MATH 125 | Discrete Mathematics I (Mason Core) | 3 |
| MATH 315 | Advanced Calculus I | 3 |
| MATH 351 | Probability | 3 |
| MATH 352 | Statistics | 3 |
| MATH 453 | Advanced Mathematical Statistics | 3 |
| MATH 551 | Regression and Time Series | 3 |
| STAT 362 | Introduction to Computer Statistical Packages | 3 |
| Select two from the following: | | 6 |
| STAT 455 | Experimental Design | |
| STAT 463 | Introduction to Exploratory Data Analysis | |
| STAT 474 | Introduction to Survey Sampling | |
| Additional Science Courses | | |
| Select additional science credits from one of the following options: | | 4-9 |
| A second sequence from the choices under "Science" above | | |
| 6 credits from more advanced courses in biology, chemistry, geology, or physics 1 | | |
| The 4-credit option of PHYS 262 and PHYS 263 | | |
| Total Credits | | 31-36 |

1Only refers to courses acceptable for credit toward a natural science major). Suggested courses include: [CHEM 313](#) Organic Chemistry I through [CHEM 332](#) Physical Chemistry II, [CHEM 463](#) General Biochemistry I, [GEOL 302](#) Mineralogy through [GEOL 364](#) Marine Geology, and [PHYS 266](#) Introduction to Thermodynamics

**Retroactive
Requirements
Updates:**

Plan of Study:

**Honors
Information:**

Honors in the Major

Eligibility

Mathematics majors who have maintained a GPA of at least 3.50 in mathematics courses and a GPA of 3.50 in all courses taken at George Mason University may apply to the departmental honors program upon completion of two MATH courses at the 300+ level (excluding [MATH 400](#) History of Math (Topic Varies) ([Mason Core](#))), at least one of which has [MATH 290](#) Introduction to Advanced Mathematics as a prerequisite. Admission to the program will be monitored by the undergraduate committee.

Honors Requirements

To graduate with honors in mathematics, a student is required to maintain a minimum GPA of 3.50 in mathematics courses and successfully complete [MATH 405](#) Honors Thesis in Mathematics I and [MATH 406](#) RS: Honors Thesis in Mathematics II with an average GPA of at least 3.50 in these two courses.

Additional Program Information

This information is required by the Office of Accreditation and Program Integrity.

Courses offered via distance (if applicable):

What is the primary delivery format for the program? Face-to-Face Only

Does any portion of this program occur off-campus? No

Are you working with a vendor / other collaborators to offer your program? No

Related Departments

Could this program prepare students for any type of professional licensure, in Virginia or elsewhere? No

Are you adding or removing a licensure component? No

Additional SCHEV & SACSCOC Information

Are you changing the total number of credits required for this program?

Are you changing the delivery format in any way (e.g adding an online option)?

Are you adding/removing a licensure option which was approved by SCHEV?

Will any portion of this program be offered at an off-campus location?

Are you adding significant new content areas to the program?

Will this program change affect any specialized accreditation?

Green Leaf Program Designation

Is this a Green Leaf program? No

Does this program cover material which crosses into another department? No

Additional Attachments [UGC-COS-Program Mod BS Math.pdf](#)
[UGC-COS-Program-Mod-bsmath_001.pdf](#)
[BS in math modification ProgramApprovalForm COSCC-2 ACTUARIAL.pdf](#)

SCHEV Proposal Executive Summary

Reviewer
Comments

Additional
Comments

Is this course required of all students in this degree program?

%wi_required.eshtml%

Key: 587