

Program Approval Form

For approval of new programs and deletions or modifications to an existing program.

Action Requested: Create New (SCHEV approval required except for minors) Type (Check one): Inactivate Existing B.A. X B.S. Minor X Modify Existing (check all that apply) M.A. M.S. M.Ed. Title (SCHEV approval required except for minors) Add Delete X Modify X Concentration (Choose one): Add Delete X Modify X Degree Requirements Admission Standards/ Application Requirements Other: Other: College/School: College of Science Department: MATH						
Submitted by: Jen Get	ttys	Ext: 3.5302	Email:	jbazaz@gmu.edu		
Effective Term: Fall Justification: (attach separa	2015 Please note: For studer program must be fully ap te document if necessary)	nts to be admitted to a ne oproved, entered into Ba	w degree, minor, certific nner, and published in th	cate or concentration, the e University Catalog.		
 Option of MATH 30 Adding "Mason Cor degree equals 120 	2 or MATH 312 re and Elective Credits" and "Mason C credits and how the Mason Core requ	ore" sections in order to irements can be fulfilled.	nave the catalog listing c	clearly show how the		
		I				
Program Title: (Required) Title must identify subject matter. L include name of college/school/dep	Mathematics, BS	1	New/Mo	odified		
Concentration(s):	1. MTHE					
Admissions Standards / Application Requirements (Required only if different from thos listed in the University Catalog) Degree Requirements: Consult University Catalog for mode attach separate document if necess using track changes for modification	e e els, 2. [Mason Core and E sary included]	Electives section not	 MATH 302 or I See the bottom listing attached 	MATH 312 n portion of the degree		
Courses offered via distai (if applicable)	nce:					
TOTAL CREDITS REQUIR	ED:					
*For Certificates Only: Ind	licate whether students are able to	pursue on a	ull-time basis	Part-time basis		
Approval Signature	es					
Department	Date College/School	Date	Provost's Office Required for Minors	Date and Interdisciplinary Programs		
If this program may impact another unit or is in collaboration with another unit at Mason, the originating department must circulate this proposal for review by those units and obtain the necessary signatures prior to submission. Failure to do so will delay action on this proposal.						
Unit Name	Unit Approval Name	Unit Approver's Sigr	nature D	ate		
For Graduate Progr	ams Only		L			

Graduate Council Member	Provost Office		Graduate Council Approval Date
For Registrar Office's Use Only: Received	Banner	Catalog	revised 6/7/12

Program Proposal Submitted to the College of Science Curriculum Committee (COSCC)

The form above is processed by the Office of the University Registrar. This second page is for the COSCC's reference. Please complete the applicable portions of this page to clearly communicate what the form above is requesting.

FOR ALL PROGRAMS (required)

Program Title: Mathematics, BS

Date of Departmental Approval: 3/11/2015

FOR INACTIVATED PROGRAMS (required if inactivating a program)

• Reason for Inactivation:

FOR MODIFIED PROGRAMS (required if modifying a program)

• Summary of the Modification: Option of MATH 302 or MATH 312 and adding "Mason Core and Elective Credits" and "Mason Core" sections.

- Text before Modification (title, degree requirements, etc.): Sections weren't included.
- Text after Modification (title, degree requirements, etc.): See attached.
- Reason for the Modification: In order to have the catalog listing clearly show how the degree equals 120 credits and how the Mason Core requirements can be fulfilled.

FOR NEW PROGRAMS (required if creating a new program)

- Reason for the New Program:
- Relationship to Existing Programs:
- Relationship to Existing Courses:
- Semester of Initial Offering:
- Insert Tentative SCHEV Proposal Below

Acalog ACMS™

2015-2016 University Catalog {working}

Mathematics, **BS**

Banner Code: SC-BS-MATH

This program of study is offered by the <u>Department of Mathematical Sciences</u> in the <u>College of Science</u>.

Students may select an optional concentration in actuarial mathematics (ACTM), applied mathematics (AMT), mathematics education (MTHE) or mathematical statistics (MTHS). Students who do not select a concentration study traditional mathematics.

Students must fulfill all <u>requirements for bachelor's degrees</u> including the <u>Mason Core</u>. In addition, students majoring in mathematics must satisfy the requirements listed below. These courses satisfy the <u>Mason Core</u> requirements in 'Quantitative Reasoning' and 'Natural Sciences'. A maximum of 6 credits of grades below 2.00 in coursework designated MATH may be applied toward the major.

MATH 290 meets the writing intensive requirement for this major.

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

Note: Students intending to enter graduate school in mathematics are strongly advised to take MATH 315 and MATH 321.

This undergraduate program offers students the option of applying to the <u>Mathematics, BS/Mathematics, Accelerated MS</u> or the <u>Mathematics, BA or BS/Curriculum and Instruction, Accelerated MEd, (Secondary Education Mathematics</u> <u>Concentration</u>); see each listing for specific requirements.

Students should carefully read the <u>General Notes on Undergraduate MATH Courses</u> section of this catalog before registering for courses.

Degree Requirements

Mathematics Core (23 credits)

- MATH 113 Analytic Geometry and Calculus I Credits: 4 (Mason Core: Quantitative Reasoning course)
- MATH 114 Analytic Geometry and Calculus II Credits: 4
- MATH 203 Linear Algebra Credits: 3
- <u>MATH 213 Analytic Geometry and Calculus III</u> Credits: 3 or <u>MATH 215 Analytic Geometry and Calculus III</u> (Honors) Credits: 3
- <u>MATH 214 Elementary Differential Equations</u> Credits: 3 or <u>MATH 216 Theory of Differential Equations</u> <u>Credits: 3</u>
- MATH 290 Introduction to Advanced Mathematics Credits: 3 (fulfills writing intensive requirement)
- MATH 322 Advanced Linear Algebra Credits: 3

Science (8 credits)

All students in the major choose a one-year sequence of a laboratory science from the following <u>Mason Core: Natural</u> <u>Science</u> courses:

Chemistry Sequence:

- <u>CHEM 211 General Chemistry</u> Credits: 4
- <u>CHEM 212 General Chemistry</u> Credits: 4 Geology Sequence:
- <u>GEOL 101 Introductory Geology I</u> Credits: 4
- <u>GEOL 102 Introductory Geology II</u> Credits: 4 Physics Sequence:
- PHYS 160 University Physics I Credits: 3 and PHYS 161 University Physics I Laboratory Credits: 1
- PHYS 260 University Physics II Credits: 3 and PHYS 261 University Physics II Laboratory Credits: 1

Computational Skills (4 credits)

All students in the major take:

• CS 112 - Introduction to Computer Programming Credits: 4

BS without Concentration (28-32 credits)

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:

Traditional Mathematics

- MATH 125 Discrete Mathematics I Credits: 3 (Mason Core: Quantitative Reasoning course)
- MATH 315 Advanced Calculus I Credits: 3
- MATH 316 Advanced Calculus II Credits: 3
- MATH 321 Abstract Algebra Credits: 3 or MATH 431 Topology Credits: 3
- 12 additional credits of MATH courses numbered above 300 (excluding MATH 400)

Additional Science

Select additional science credits from one of the following three options:

- 1. A second sequence from the choices under "Science (8 credits)" above
- 2. 6 credits from more advanced courses in chemistry, geology, or physics (but only courses acceptable for credit toward a natural science major)
- 3. The 4-credit option of <u>PHYS 262 University Physics III Credits: 3</u> and <u>PHYS 263 University Physics III</u> <u>Laboratory Credits: 1</u>

Without Concentration Total: 28-32 credits

BS with Concentration (28-47 credits)

In addition to the mathematics core, science, and computational skills requirements listed above, students may select an optional concentration in actuarial mathematics (ACTM), applied mathematics (AMT), mathematical statistics (MTHS), or mathematics education (MTHE).

▲ Concentration in Actuarial Mathematics (ACTM)

- MATH 351 Probability Credits: 3
- MATH 352 Statistics Credits: 3
- <u>MATH 551 Regression and Time Series</u> Credits: 3
- <u>MATH 554 Financial Mathematics</u> Credits: 3
- <u>MATH 555 Actuarial Modeling I</u> Credits: 3
- <u>MATH 556 Actuarial Modeling II</u> Credits: 3
- <u>ACCT 203 Survey of Accounting</u> Credits: 3
- ECON 103 Contemporary Microeconomic Principles Credits: 3
- ECON 306 Intermediate Microeconomics Credits: 3 or ECON 310 Money and Banking Credits: 3 or FNAN 321 - Financial Institutions Credits: 3
 For mathematics majors, the Department of Fernancial has agreed to units the ECON 104 manual statement of Fernancial Laboration and the ECON 104 manual statement of Fernancial Laboration and the ECON 104 manual statement of Fernancial Laboration and the ECON 104 manual statement of Fernancial Laboration and the ECON 104 manual statement of Fernancial Laboration and the ECON 104 manual statement of Fernancial Laboration and the ECON 104 manual statement of Fernancial Laboration and the ECON 104 manual statement of Fernancial Statement of Fernacial Statement of Fernancial Statement of Fernancial Statem

For mathematics majors, the <u>Department of Economics</u> has agreed to waive the <u>ECON 104</u> prerequisite for <u>ECON 306</u>

- <u>STAT 362 Introduction to Computer Statistical Packages</u> Credits: 3 Select two from the following three courses:
- MATH 441 Deterministic Operations Research Credits: 3
- <u>MATH 442 Stochastic Operations Research</u> Credits: 3
- MATH 446 Numerical Analysis I Credits: 3

ACTM Concentration Total: 36 credits

▲ Concentration in Applied Mathematics (AMT)

- MATH 125 Discrete Mathematics I Credits: 3 (Mason Core: Quantitative Reasoning course)
- MATH 315 Advanced Calculus I Credits: 3
- MATH 351 Probability Credits: 3
- <u>MATH 413 Modern Applied Mathematics I</u> Credits: 3
- <u>MATH 414 Modern Applied Mathematics II</u> Credits: 3
- MATH 446 Numerical Analysis I Credits: 3
- 6 credits of MATH courses numbered above 300 (excluding <u>MATH 400</u>)
- Select additional science credits from one of the following three options:
 - 1. A second sequence from the choices under "Science (8 credits)" above
 - 2. 6 credits from more advanced courses in chemistry, geology, or physics (but only courses acceptable for credit toward a natural science major)
 - 3. The 4-credit option of <u>PHYS 262 University Physics III Credits: 3</u> and <u>PHYS 263 University</u> <u>Physics III Laboratory Credits: 1</u>

AMT Concentration Total: 28-32 credits

Concentration in Mathematical Statistics (MTHS)

- MATH 125 Discrete Mathematics I Credits: 3 (Mason Core: Quantitative Reasoning course)
- MATH 315 Advanced Calculus I Credits: 3

- MATH 351 Probability Credits: 3
- MATH 352 Statistics Credits: 3
- MATH 453 Advanced Mathematical Statistics Credits: 3
- <u>MATH 551 Regression and Time Series</u> Credits: 3
- <u>STAT 362 Introduction to Computer Statistical Packages</u> Credits: 3 Select two from the following courses:
- STAT 455 Experimental Design Credits: 3
- STAT 463 Introduction to Exploratory Data Analysis Credits: 3
- STAT 474 Introduction to Survey Sampling Credits: 3
- Select additional science credits from one of the following three options:
 - 1. A second sequence from the choices under "Science (8 credits)" above
 - 2. 6 credits from more advanced courses in chemistry, geology, or physics (but only courses acceptable for credit toward a natural science major)
 - 3. The 4-credit option of <u>PHYS 262 University Physics III Credits: 3</u> and <u>PHYS 263 University</u> <u>Physics III Laboratory Credits: 1</u>

MTHS Concentration Total: 31-35 credits

▲ Concentration in Mathematics Education (MTHE)

A grade of 'C' or better is required for all licensure coursework.

- MATH 125 Discrete Mathematics I Credits: 3 (Mason Core: Quantitative Reasoning course)
- MATH 302 Foundations of Geometry Credits: 3 or MATH 312 Geometry Credits: 3
- MATH 315 Advanced Calculus I Credits: 3
- MATH 321 Abstract Algebra Credits: 3
- MATH 351 Probability Credits: 3
- EDCI 372 Teaching Mathematics in the Secondary School Credits: 3
- EDCI 472 Advanced Methods for Teaching Mathematics in the Secondary School Credits: 3
- EDCI 490 Student Teaching in Education Credits: 6 (Mason Core: Synthesis course)
- EDRD 419 Literacy in the Content Areas Credits: 3
- EDUC 372 Human Development, Learning, and Teaching Credits: 3 (Mason Core: Social and Behavioral Science course)
- EDUC 422 Foundations of Secondary Education Credits: 3
- One 3-credit MATH course numbered above 300 (excluding MATH 400)
- Select additional science credits from one of the following three options:
 - 1. A second sequence from the choices under "Science (8 credits)" above
 - 2. 6 credits from more advanced courses in chemistry, geology, or physics (but only courses acceptable for credit toward a natural science major)
 - 3. The 4-credit option of <u>PHYS 262 University Physics III Credits: 3</u> and <u>PHYS 263 University</u> <u>Physics III Laboratory Credits: 1</u>

MTHE Concentration Total: 43-47 credits

Mason Core and Elective Credits (38-57 credits)

The remaining credits (see below for specific credit counts by concentration) are available to fulfill any remaining Mason

<u>Core</u> requirements (outlined below). Once those and all <u>requirements for bachelor's degrees</u> are met, any remaining credits may be completed by elective courses. Students are strongly encouraged to consult with their advisor to ensure that they fulfill all requirements.

- Without concentration: 53-57 credits
- ACTM concentration: 49 credits
- AMT concentration: 53-57 credits
- MTHS concentration: 50-54 credits
- MTHE concentration: 38-42 credits

Mason Core

Please note that some Mason Core requirements may already be fulfilled by the major requirements listed above.

Expand each item below for a link to specific course lists for each category:

Foundation Requirements (15-19 credits)

- Mason Core UWCU Written Communication Credits: 6
- <u>Mason Core UOC Oral Communication Credits: 3</u>
- Mason Core UQR Quantitative Reasoning Credits: 3
- Mason Core UITC Information Technology Credits: 3-7

Core Requirements (22 credits)

- Mason Core UFA Arts Credits: 3
- Mason Core UGU Global Understanding Credits: 3
- Mason Core ULIT Literature Credits: 3
- Mason Core UNSL Natural Science Credits: 7
- Mason Core USBS Social and Behavioral Sciences Credits: 3
- Mason Core UWC Western Civilization/Western History Credits: 3

Synthesis/Capstone Requirement (minimum 3 credits)

• Mason Core USYN - Synthesis/Capstone Credits: minimum 3

Degree Total: Minimum 120 credits