MATHEMATICS, BA

Banner Code: SC-BA-MATH

Academic Advising

Exploratory Hall, Room 4411
Fairfax Campus

Phone: 703-993-1482
Email: danders1@gmu.edu
Website: math.gmu.edu/degree-programs.php

Students may select an optional concentration in mathematics education; students who do not select this concentration study traditional mathematics.

Teacher Licensure

Students who wish to become teachers and plan to seek teacher licensure should consider the following options:

• Secondary Education – Mathematics (6-12) Undergraduate Certificate
• Mathematics, BA or BS/Curriculum and Instruction, Accelerated MEd (Secondary Education Mathematics concentration)

Interested students should attend an information session early in their undergraduate career. For more information, visit the Graduate School of Education’s website (http://gse.gmu.edu).

Admissions & Policies

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 (https://www2.gmu.edu/admissions-aid/apply-now).

Policies

Students must fulfill all Requirements for Bachelor’s Degrees, including the Mason Core. As outlined in the Requirements tab, students in this bachelor’s program must also complete the additional College Requirements for the BA Degree.

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.

Course Recommendations and Policies

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 Statistics for Engineers and Scientists I; and both MATH 352 Statistics and STAT 344 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:

<table>
<thead>
<tr>
<th>Course</th>
<th>May Not Receive Credit for</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 113 or MATH 123</td>
<td>MATH 105 or MATH 108</td>
</tr>
<tr>
<td>MATH 351 or STAT 344</td>
<td>MATH 110</td>
</tr>
<tr>
<td>MATH 441</td>
<td>MATH 111</td>
</tr>
<tr>
<td>MATH 125</td>
<td>MATH 112</td>
</tr>
</tbody>
</table>

Requirements

Degree Requirements

Total credits: minimum 120

Students should refer to the Admissions & Policies tab for specific policies related to this program.

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

Students may select an optional concentration in mathematics education; students who do not select this concentration study traditional mathematics.

Core Courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 113</td>
<td>Analytic Geometry and Calculus I (Mason Core)</td>
<td>4</td>
</tr>
<tr>
<td>MATH 114</td>
<td>Analytic Geometry and Calculus II</td>
<td>4</td>
</tr>
<tr>
<td>MATH 125</td>
<td>Discrete Mathematics I (Mason Core)</td>
<td>3</td>
</tr>
<tr>
<td>MATH 203</td>
<td>Linear Algebra</td>
<td>3</td>
</tr>
<tr>
<td>MATH 213 or MATH 215</td>
<td>Analytic Geometry and Calculus III (Honors)</td>
<td>3</td>
</tr>
<tr>
<td>MATH 214 or MATH 216</td>
<td>Elementary Differential Equations Theory of Differential Equations</td>
<td>3</td>
</tr>
<tr>
<td>MATH 290</td>
<td>Introduction to Advanced Mathematics</td>
<td>3</td>
</tr>
<tr>
<td>MATH 322</td>
<td>Advanced Linear Algebra</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Credits 26

1 Fulfills the writing intensive requirement.

BA without Concentration

In addition to completing the core courses above, students not selecting the concentration option must complete 12 additional traditional mathematics credits in MATH courses numbered above 300.

Select 12 credits in MATH 300-level or higher 1 12

Total Credits 12

1 Excluding MATH 400 History of Math (Topic Varies) (Mason Core)
Concentration in Mathematics Education (MTHE)

Students selecting the mathematics education concentration take the following coursework. A grade of ‘C’ or better is required for all licensure coursework.

- **MATH 302** Foundations of Geometry *3*
  or **MATH 312** Geometry *3*
- **MATH 315** Advanced Calculus I *3*
- **MATH 321** Abstract Algebra *3*
- **MATH 351** Probability *3*
- **EDCI 372** Teaching Mathematics in the Secondary School *3*
- **EDCI 472** Advanced Methods for Teaching Mathematics in the Secondary School *3*
- **EDCI 490** Student Teaching in Education (Mason Core) *6*
- **EDRD 419** Literacy in the Content Areas *3*
- **EDUC 372** Human Development, Learning, and Teaching (Mason Core) *3*
- **EDUC 422** Foundations of Secondary Education *3*

**Total Credits** *33*

Mason Core and Elective Credits

In order to meet a minimum of 120 credits, this degree requires additional credits (specific credit counts by concentration are shown below), which may be applied toward any remaining Mason Core requirements (outlined below), Requirements for Bachelor’s Degrees, College Requirements for the BA Degree (outlined below), and elective courses. Students are strongly encouraged to consult with their advisors to ensure that they fulfill all requirements.

- Without concentration: 82 credits
- With concentration: 61 credits

Mason Core

Note: Some Mason Core requirements may already be fulfilled by the major requirements listed above. Students are strongly encouraged to consult their advisors to ensure they fulfill all remaining Mason Core requirements.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Philosophy or Religious Studies</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Code</td>
<td>Title</td>
<td>Credits</td>
</tr>
<tr>
<td>PHIL</td>
<td>1 Classical Western Political Theory</td>
<td>minimum 3 credits</td>
</tr>
<tr>
<td>RELI</td>
<td>1 Modern Western Political Theory</td>
<td></td>
</tr>
</tbody>
</table>

**Social and Behavioral Sciences**

Choose one approved Mason Core: Social and Behavioral Sciences course in addition to the Mason Core-required course for a total of 6 credits. The two courses used to fulfill the combined college-level and university requirements must be from different disciplines.

This requirement may be fulfilled by completing any course in ANTH, CRIM, ECON, GOVT, HIST, LING, PSYC, or SOCI, and the following GGS courses:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>GGS 101</td>
<td>Major World Regions (Mason Core)</td>
<td></td>
</tr>
<tr>
<td>GGS 103</td>
<td>Human Geography (Mason Core)</td>
<td></td>
</tr>
<tr>
<td>GGS 110</td>
<td>Introduction to Geoinformation</td>
<td></td>
</tr>
<tr>
<td>GGS 301</td>
<td>Political Geography</td>
<td></td>
</tr>
<tr>
<td>GGS 303</td>
<td>Geography of Resource Conservation</td>
<td></td>
</tr>
<tr>
<td>GGS 304</td>
<td>Population Geography (Mason Core)</td>
<td></td>
</tr>
<tr>
<td>GGS 305</td>
<td>Economic Geography</td>
<td></td>
</tr>
<tr>
<td>GGS 306</td>
<td>Urban Geography</td>
<td></td>
</tr>
<tr>
<td>GGS 315</td>
<td>Geography of the United States</td>
<td></td>
</tr>
<tr>
<td>GGS 316</td>
<td>Geography of Latin America</td>
<td></td>
</tr>
<tr>
<td>GGS 320</td>
<td>Geography of Europe</td>
<td></td>
</tr>
<tr>
<td>GGS 325</td>
<td>Geography of North Africa and the</td>
<td></td>
</tr>
<tr>
<td>GGS 330</td>
<td>Geography of the Soviet Succession</td>
<td></td>
</tr>
<tr>
<td>GGS 357</td>
<td>Structures in Urban Governance and</td>
<td></td>
</tr>
<tr>
<td>GGS 380</td>
<td>Geography of Virginia</td>
<td></td>
</tr>
</tbody>
</table>

**Total Credits** *3*
HIST 100 History of Western Civilization (Mason Core) and HIST 125 Introduction to World History (Mason Core) may not be used to fulfill this requirement.

**Natural Science**

Choose one credit in addition to the Mason Core: Natural Science requirement for a total of 8 credits. This combined college-level and university requirement must be fulfilled by completing two of any approved Mason Core: Natural Science courses that include a laboratory experience.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Select an additional Mason Core Natural Science course</td>
<td>1</td>
</tr>
</tbody>
</table>

1. BIOL 124 Human Anatomy and Physiology and BIOL 125 Human Anatomy and Physiology may not be used to fulfill this requirement.

**Foreign Language**

Intermediate-level proficiency in one foreign language is required. This requirement may be fulfilled by completing a course in a foreign language numbered 202, 209, or 210 (or higher-level courses taught in the language).

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Select a foreign language course numbered 202, 209, 210, or higher if a waiver isn't applicable</td>
<td>0-3</td>
</tr>
</tbody>
</table>

1. Students may be eligible for a waiver of this requirement if they are already proficient in a second language or if they have received a satisfactory score on an approved proficiency test. Additional information on waivers can be found via the college's Office of Academic and Student Affairs (https://cos.gmu.edu/uaa).

**Non-Western Culture**

Choose one approved Non-Western Culture Requirement course in addition to the course used to fulfill the Mason Core: Global Understanding requirement. A course used to fulfill the Mason Core: Global Understanding requirement may not be simultaneously used to satisfy this college-level requirement. However, a course used to fulfill this requirement may be used simultaneously to fulfill any other requirements (Mason Core requirements, college-level requirements, or requirements for the major).

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Select 3 credits from approved Non-Western Culture courses if a waiver isn't applicable:</td>
<td>0-3</td>
</tr>
</tbody>
</table>

- ANTH 114 Introduction to Cultural Anthropology (Mason Core) 3
- ANTH 300 Civilizations 3
- ANTH 301 Native North Americans 3
- ANTH 302 Peoples and Cultures of Latin America (Mason Core) 3
- ANTH 303 Peoples and Cultures of the Andes 3
- ANTH 306 Peoples and Cultures of Island Asia (Mason Core) 3
- ANTH 307 Ancient Mesoamerica (Mason Core) 3
- ANTH 308 Peoples and Cultures of the Middle East (Mason Core) 3
- ANTH 309 Peoples and Cultures of India (Mason Core) 3
- ANTH 313 Myth, Magic, and Mind (Mason Core) 3
- ANTH 314 Zombies 3
- ANTH 316 Peoples and Cultures of the Caribbean (Mason Core) 3
- ANTH 323 Digging and Dealing in the Dead: Ethics in Archaeology 3
- ANTH 330 Peoples and Cultures of Selected Regions: Non-Western 3
- ANTH 332 Cross-Cultural Perspectives on Globalization (Mason Core) 3
- ANTH 381 Medical Anthropology 3
- ANTH 383 Cities of the Global South 3
- ANTH 396 Issues in Anthropology: Social Sciences (Mason Core) 3
- ARAB 360 Topics in Arabic Cultural Production 3
- ARAB 420 Survey of Arabic Literature 3
- ARAB 440 Topics in Arabic Religious Thought and Texts (Mason Core) 3
- ARTH 203 Survey of Asian Art (Mason Core) 3
- ARTH 204 Survey of Latin American Art (Mason Core) 3
- ARTH 206 Survey of African Art (Mason Core) 3
- ARTH 318 Art and Archaeology of Ancient Egypt 3
- ARTH 319 Art and Archaeology of the Ancient Near East (Mason Core) 3
- ARTH 320 Art of the Islamic World (Mason Core) 3
- ARTH 382 Arts of India (Mason Core) 3
- ARTH 383 Arts of Southeast Asia (Mason Core) 3
- ARTH 384 Arts of China (Mason Core) 3
- ARTH 385 Arts of Japan (Mason Core) 3
- ARTH 386 The Silk Road (Mason Core) 3
- ARTH 482 RS: Advanced Studies in Asian Art 3
- CHIN 318 Introduction to Classical Chinese (Mason Core) 3
- CHIN 320 Contemporary Chinese Film 3
- CHIN 325 Major Chinese Writers (Mason Core) 3
- DANC 118 World Dance (Mason Core) 3
- ECON 361 Economic Development of Latin America (Mason Core) 3
- ECON 362 African Economic Development (Mason Core) 3
- FREN 451 Topics in Sub-Saharan Francophone Literature and Culture 3
- FREN 454 Topics in Caribbean Francophone Literature and Culture 3
- GGS 101 Major World Regions (Mason Core) 3
- GGS 316 Geography of Latin America 3
- GGS 325 Geography of North Africa and the Middle East 3
- GGS 330 Geography of the Soviet Succession States 3
- GGS 399 Select Topics in GGS 3
- GOVT 328 Non-Western Political Theory 3
- GOVT 332 Government and Politics of the Middle East and North Africa 3
- GOVT 333 Government and Politics of Asia 3
GOVT 340 Central Asian Politics 3
GOVT 341 Chinese Foreign Policy 3
GOVT 345 Islam and Politics 3
GOVT 432 Political Change and Social Development in Sub-Saharan Africa 3
GOVT 433 Political Economy of East Asia 3
HIST 251 Survey of East Asian History (Mason Core) 3
HIST 252 Survey of East Asian History (Mason Core) 3
HIST 261 Survey of African History (Mason Core) 3
HIST 262 Survey of African History (Mason Core) 3
HIST 271 Survey of Latin American History (Mason Core) 3
HIST 272 Survey of Latin American History (Mason Core) 3
HIST 281 Survey of Middle Eastern Civilization (Mason Core) 3
HIST 282 Survey of Middle Eastern Civilization (Mason Core) 3
HIST 326 Stalinism 3
HIST 327 The Soviet Union and Russia Since World War II 3
HIST 328 Rise of Russia (Mason Core) 3
HIST 329 Modern Russia and the Soviet Union (Mason Core) 3
HIST 353 History of Traditional China 3
HIST 354 Modern China 3
HIST 356 Modern Japan (Mason Core) 3
HIST 357 Postwar Japan (Mason Core) 3
HIST 358 Post-1949 China (Mason Core) 3
HIST 360 History of South Africa (Mason Core) 3
HIST 364 Revolution and Radical Politics in Latin America (Mason Core) 3
HIST 365 Conquest and Colonization in Latin America (Mason Core) 3
HIST 366 Comparative Slavery 3
HIST 367 History, Fiction, and Film in Latin America 3
HIST 387 Topics in Global History (Mason Core) 3-6
HIST 426 The Russian Revolution 3
HIST 460 Modern Iran (Mason Core) 3
HIST 461 Arab-Israeli Conflict 3
HIST 462 Women in Islamic Society (Mason Core) 3
HIST 465 The Middle East in the 20th Century 3
JAPA 310 Japanese Culture in a Global World (Mason Core) 3
JAPA 340 Topics in Japanese Literature (Mason Core) 3
KORE 320 Korean Popular Culture in a Global World 3
MUSI 103 Musics of the World (Mason Core) 3
RELI 211 Religions of the West (Mason Core) 3
RELI 212 Religions of Asia (Mason Core) 3
RELI 240 Death and the Afterlife in World Religions 3
RELI 272 Islam 3
RELI 313 Hinduism (Mason Core) 3
RELI 314 Chinese Philosophies and Religious Traditions 3
RELI 315 Buddhism (Mason Core) 3
RELI 337 Mysticism: East and West 3
RELI 365 Muhammad: Life and Legacy 3
RELI 374 Islamic Thought (Mason Core) 3
RELI 375 Qur’an and Hadith 3
RELI 379 Islamic Law, Society, and Ethics 3
RELI 387 Islam, Democracy, and Human Rights 3
RELI 490 Comparative Study of Religions (Mason Core) 3
RUSS 353 Russian Civilization (Mason Core) 3
RUSS 354 Contemporary Post-Soviet Life (Mason Core) 3

1 Students who can document attendance at a native school in a non-western country for at least four years may request a waiver from this requirement through the CHSS Undergraduate Academic Affairs Office (http://chssundergrad.gmu.edu).

Honors

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.

Accelerated Master’s

Mathematics, BA or BS/Mathematics, Accelerated MS

Overview
This degree program allows academically strong Mathematics, BA and Mathematics, BS students to obtain their bachelor’s and a Mathematics, MS by successfully completing 144 credits. Well-prepared students may be admitted to this program after the completion of 90 undergraduate credits. Upon completion and conferral of the bachelor’s degree and with satisfactory graduate-level performance (3.00 GPA) in graduate courses, students are given advanced standing in the Mathematics, MS program and complete an additional 24 credits to receive the master’s degree.
For more detailed information, see AP.6.7 Bachelor’s/Accelerated Master’s Degrees. For policies governing all graduate degrees, see AP.6 Graduate Policies.

**Application Requirements**

Applicants to all graduate programs at George Mason University must meet the admission standards and application requirements for graduate study as specified in Graduate Admission Policies. Application information for this accelerated master’s program can be found on the Department of Mathematical Sciences website (http://math.gmu.edu).

Successful applicants will have an overall undergraduate GPA of at least 3.00. Additionally, they will have completed the following courses with a GPA of 3.00 or higher: MATH 315 Advanced Calculus I, MATH 321 Abstract Algebra, and MATH 322 Advanced Linear Algebra.

**Accelerated Option Requirements**

At the beginning of the student’s final undergraduate semester, students must submit a bachelor’s/accelerated master’s transition form (available from the Office of the University Registrar (http://registrar.gmu.edu)) to the College of Science’s Office of Academic and Student Affairs (https://cos.gmu.edu/about/contact-us). Students must begin their master’s program in the semester immediately following conferral of the bachelor’s degree.

Students must maintain an overall GPA of 3.00 or higher in graduate coursework.

**Reserve Graduate Credit**

While still in undergraduate status, a maximum of 6 additional graduate credits may be taken as reserve graduate credit and applied to the master’s program. Reserve graduate credits do not apply to the undergraduate degree. See AP.1.4.4 Graduate Course Enrollment by Undergraduates.

**Mathematics, BA or BS/Curriculum and Instruction, Accelerated MEd, (Secondary Education Mathematics concentration)**

**Overview**

Highly-qualified undergraduates may be admitted to the bachelor’s/accelerated master’s program and obtain a BA or BS in Mathematics and an MEd in Curriculum and Instruction (concentration in secondary education mathematics) in an accelerated time-frame after satisfactory completion of 149 credits. See AP.6.7 Bachelor’s/Accelerated Master’s Degree for policies related to this program.

This accelerated option is offered jointly by the Department of Mathematical Sciences and the Graduate School of Education.

Students in an accelerated degree program must fulfill all university requirements for the master’s degree. For policies governing all graduate degrees, see AP.6 Graduate Policies.

**Application Requirements**

Applicants to all graduate programs at George Mason University must meet the admission standards and application requirements for graduate study as specified in Graduate Admissions Policies. For information specific to this accelerated master’s program, see Application Requirements and Deadlines (https://cehd.gmu.edu/bachelors-accelerated-masters-program).

### Accelerated Option Requirements

Students complete the following courses in their senior year:

<table>
<thead>
<tr>
<th></th>
<th>Fall Semester</th>
<th>Credits</th>
<th>Spring Semester</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDCI 572</td>
<td></td>
<td>3</td>
<td>EDCI 672</td>
<td>3</td>
</tr>
<tr>
<td>EDUC 672</td>
<td></td>
<td>3</td>
<td>EDRD 619</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Credits 12

Alternative course options are available for students who begin their program in the spring. Students should contact the coordinator for the Bachelor’s/Accelerated Master’s Degree program in the College of Education and Human Development.

While undergraduate students, accelerated master’s students are able to apply two of the courses listed above to both the bachelor’s and master’s degrees. These courses are considered advanced standing for the MEd. A minimum grade of B must be earned to be eligible to count as advanced standing. The other two courses are taken as reserve graduate credit and do not apply to the undergraduate degree. Early in their final undergraduate semester, students must submit the Bachelor’s/Accelerated Master’s Transition Form to the CEHD Admissions Office and specify which of the four courses are to be designated as advanced standing and reserve graduate credit.