Bachelor of Arts with a Major in Mathematics

Bachelor of Arts in Mathematics

Selected Educational Outcomes

1. Students will explain and produce mathematical proofs in set theory, algebra, and analysis to indicate that they have acquired the necessary logical reasoning, reading, and writing skills.
2. Students will prove statements, produce examples, and apply the appropriate theoretical results to a given problem to show understanding of various algebraic structures, including, but not limited to, groups, fields, rings, and vector spaces.
3. Students will prove statements, produce examples, and apply the appropriate theoretical results to a given problem to demonstrate understanding of the analytic structure necessary for the classical (real-valued function) calculus and its generalization.
4. Students will synthesize the results and techniques of the major branches of mathematics, demonstrated by presentation of mathematics in written and oral form.

Examples of Outcome Assessments

The department assesses the extent to which the program requirements create the desired outcomes by a variety of techniques. Examples of these assessments include the following:

1. The capstone courses are used to assess student progress since taking Area F courses. They determine if students have mastered effective oral and written communication skills, acquired critical analysis skills, and learned to use the library and technological resources in solving non-routine problems. Assessment methods include student projects and presentations.
2. Student examinations and samples of student work are kept in the department and are examined by the faculty to assess student content knowledge.
3. Available student and alumni survey data collected by the University will be examined to determine student satisfaction with their undergraduate preparation for further education or employment.

In addition to the assessments for students enrolled in the B.A. in mathematics, students in the teacher certification track will:

1. demonstrate content knowledge by passing the state-required content assessment.
2. demonstrate pedagogical content knowledge and knowledge of evidence-based strategies through development of lesson plans employing research-validated procedures and effective content pedadgogy.
3. demonstrate skills in assessment, instructional strategies, use of technology, and monitoring/modifying instruction during observed teaching episodes evaluated by a university professor and a P-12 mentor teacher.
4. demonstrate through a Teacher Work Sample (TWS) their ability to positively impact P-12 learning.

Requirements for the Bachelor of Arts Degree with a Major in Mathematics

Code	Title	Hours
Core Curriculum		**60**
Core Curriculum Areas A-E (See VSU Core Curriculum)		42
Mathematics majors are required to take MATH 1112 or MATH 1113 or MATH 2261 in Area A and MATH 2261 or MATH 2262 in Area D.		
Core Curriculum Area F		
MATH 2261	Analytic Geometry and Calculus I (“spillover” from Area D)	1
MATH 2262	Analytic Geometry and Calculus II	4
MATH 2263	Analytic Geometry and Calculus III	4
CS 1010	Algorithmic Problem Solving (1 credit spills over into “Supporting Courses”)	3
or CS 1301	Principles of Programming I	
or CS 1340	Computing for Scientists	
Part of 3-course sequence in any foreign language		6
Senior College Curriculum		**60**
MATH 2150	Introduction to Linear Algebra	3
MATH 3600	Probability and Statistics	3
MATH 4621	Mathematical Statistics I	3
MATH 3040	Set Theory	3
MATH 3340	Ordinary Differential Equations	3
MATH 4150	Linear Algebra	3

MATH 4260	Mathematical Analysis	3
MATH 4081	Modern Algebra I	3
MATH 4980	Senior Seminar	3
Select two of the following:		6
MATH 3010	History of Mathematics	
MATH 3510	Foundations of Geometry	
MATH 4082	Modern Algebra II	
MATH 4110	Number Theory	
MATH 4300	Functions of a Complex Variable	
MATH 4540	Topology	
Supporting Courses		
CS 1301	Principles of Programming I (“spillover” from Area F)	
Electives (must include at least 9 hours of courses numbered 3000 or above with at least 6 hours in a single discipline outside the major)		
Total hours required for the degree		**120**

Additional Requirements and Notes

1. The foreign language courses in Area F must meet Arts and Sciences guidelines for the B.A. degree; furthermore, these courses, along with an additional language course either in Area C or in Electives, must constitute a 3-course sequence in any foreign language. Minimum acceptable grades in the language courses are the same as minimum acceptable grades in the Core Curriculum.
2. If taken, a grade of “C” or better is required in MATH 1111, MATH 1112, MATH 1113, MATH 2150, MATH 2261, MATH 2262, MATH 2263, CS 1010, CS 1301, and CS 1340.

Bachelor of Arts in Mathematics -- Secondary Education Track

The Secondary Education Track as a 120-hour degree program that leads to initial Georgia teacher certification for mathematics grades 6-12. Students must be admitted to the Teacher Education Program in the Dewar College of Education and Human Services prior to enrolling in the 3000- and 4000-level courses in professional education. Student teachers must meet the Student Teaching requirements of the College of Education and Human Services.

Selected Educational Outcomes

Students in initial teacher education programs will:

1. master the content that they plan to teach and explain principles and concepts delineated in professional, state, and institutional standards.
2. understand the relationship of content and content-specific pedagogy to develop a broad knowledge of instructional strategies that draw upon content and pedagogical knowledge delineated in professional, state, and institutional standards.
3. analyze educational research findings and incorporate new information into their practice,
4. assess and analyze student learning, make appropriate adjustments to instruction, and monitor student learning.

Examples of Outcome Assessments

In addition to the assessments for students enrolled in the B.A. in Mathematics, students in the teacher certification track will:

1. demonstrate content knowledge by passing the state-required content assessment
2. demonstrate pedagogical content knowledge and knowledge of evidence-based strategies through development of lesson plans employing research-validated procedures and effective content pedagogy.
3. demonstrate skills in assessment, instructional strategies, use of technology, and monitoring/modifying instruction during observed teaching episodes evaluated by a university professor and P-12 mentor teacher.
4. demonstrate through a Teacher Work Sample (TWS) their ability to positively impact P-12 learning.

Requirements for the Bachelor of Arts Degree with a Major in Mathematics -- Secondary Education Track

Code	Title	Hours
Core Curriculum Areas A-E (See VSU Core Curriculum)		**42**
Mathematics majors are required to take MATH 1112 or MATH 1113 or MATH 2261 in Area A and MATH 2261 or MATH 2262 in Area D		
Core Curriculum Area F		**18**
MATH 2261	Analytic Geometry and Calculus I ("spillover" from Area D)	1

MATH 2262 & MATH 2263	Analytic Geometry and Calculus II and Analytic Geometry and Calculus III	8
Select one of the following:		3
CS 1010	Algorithmic Problem Solving	
CS 1301	Principles of Programming I	
CS 1340	Computing for Scientists	
Part of a three-course sequence in any foreign language		6
Senior College Curriculum		**60**
Courses Required for the Major		
MATH 2150	Introduction to Linear Algebra	3
MATH 3600	Probability and Statistics	3
MATH 4621	Mathematical Statistics I	3
MATH 3040	Set Theory	3
MATH 3340	Ordinary Differential Equations	3
MATH 4150	Linear Algebra	3
MATH 4260	Mathematical Analysis	3
MATH 4081	Modern Algebra I	3
MATH 4980	Senior Seminar	3
MAED 3500	Curriculum and Methods for Teaching Middle Grades Mathematics	3
Select one of the following:		
MATH 3010	History of Mathematics	
MATH 3510	Foundations of Geometry	
MATH 4082	Modern Algebra II	
MATH 4110	Number Theory	
MATH 4300	Functions of a Complex Variable	
MATH 4540	Topology	
Courses in Professional Education		
EDUC 2110	Investigating Critical and Contemporary Issues in Education	3
EDUC 2120	Exploring Socio-Cultural Perspectives on Diversity	3
EDUC 2130	Exploring Learning and Teaching	3
EDUC 2999	Teacher Education Requirements	0
SPEC 3000	Serving Students with Diverse Needs	3
MAED 4500	Curriculum and Methods for Teaching Secondary Mathematics	3
MAED 4790	Student Teaching	9
MAED 4800	Senior Professional Development Seminar	3
Total Hours Required for the Degree		**120**

Additional Requirements and Notes

1. The foreign language courses in Area F must meet Arts and Sciences guidelines for the B.A. degree; furthermore, these courses, along with an additional language course either in Area C or in Electives, must constitute a 3-course sequence in any foreign language. Minimum acceptable grades in the language courses are the same as minimum acceptable grades in the Core Curriculum.
2. If taken, a grade of “C” or better is required
   in MATH 1111, MATH 1112, MATH 1113, MATH 2150, MATH 2261, MATH 2262, MATH 2263, CS 1010, CS 1301, and CS 1340.