Bachelor of Science with a Major in Applied Mathematics

Selected Educational Outcomes

1. Students will solve problems involving groups, rings, fields, and their applications.
2. Students will derive discrete and continuous probability distributions and solve problems involving linear and non-linear optimization, expected values and probabilities for discrete and continuous random variables, and numerical methods.
3. Students will exhibit the logical reasoning skills and technical background necessary to do mathematical proofs by proving theorems in Transitions to Higher Math, analysis, linear algebra, mathematical statistics, and modern algebra.
4. Students will use mathematical software and modeling to solve problems in numerical analysis, operations research, and statistics.
5. Students will communicate mathematical ideas and modeling and present them in class to the faculty.

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.

Requirements for the Bachelor of Science Degree with a Major in Applied Mathematics

Core Curriculum		60
Core Curriculum Areas A-E (See VSU Core Curriculum)		42
Applied 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 1301	Principles of Programming I (3 credits “spill over” into “Supporting Courses”)	1
PHYS 2211K	Principles of Physics I	4
PHYS 2212K	Principles of Physics II	4
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 4081	Modern Algebra I	3
MATH 4260	Mathematical Analysis	3
MATH 4651	Numerical Analysis I	3
MATH 4901	Operations Research I	3
MATH 4910	Mathematical Models	3
Select one of the following:		3
MATH 4622	Mathematical Statistics II	
MATH 4652	Numerical Analysis II	
MATH 4902	Operations Research II	

PHYS 3100	Optics	
PHYS 4111	Theoretical Mechanics I	
PHYS 4211	Electromagnetism I	
PHYS 4411	Quantum Mechanics I	
Supporting Courses		6-9
CS 1301	Principles of Programming I (“spillover” from Area F)	
Foreign Language & Culture Requirement		
Electives (Must include at least 6 hours of courses numbered 3000 or above in a single discipline outside the major)		15-18
Total hours required for the degree		120

Additional Requirements and Notes

1. Students must complete 16 credits of laboratory science, including the calculus-based physics indicated in Area F.
2. A grade of “C” or better must be earned in all “Courses Required for the Major.” Also, a grade of “C” or better is required in MATH 1111, MATH 1112, MATH 1113, MATH 2150, MATH 2261, MATH 2262, MATH 2263, and CS 1301, if any of those courses are taken.
3. Students must complete a sequence of two courses in any foreign language, either in “Supporting Courses” or in a combination of Area C and “Supporting Courses.” Minimum acceptable grades in the language courses are the same as minimum acceptable grades in the Core Curriculum.