Augustana College

Applied Mathematics

Courses required for the first year: MATH-160 or the necessary prerequisites for MATH-160
Courses recommended for the first year: MATH-160, MATH-220, MATH-250
Contact: Dr. Stacey Rodman, Department Chair (staceyrodman@augustana.edu)

The Major in Applied Mathematics

It is recommended that the student complete MATH-160 Calculus, MATH-220 Integration Methods, and MATH-250 Discrete Mathematics in the first year to allow for the flexibility in scheduling. It is strongly recommended that the student, at minimum, complete MATH-160 Calculus the first year. A student must complete MATH-160 Calculus no later than Fall term of the second year to graduate in four years.

If a student has credit for MATH-160, then MATH-260 Multivariable Calculus is recommended for Fall term first year.

A student places into Calculus (MATH-160) if at least one of the following criteria is met:

- Student's MIS* score is 920 or better AND the student has completed a pre-calculus course with a grade of B or better
- Student completed MATH-140 with a grade of C or better
- Student has transfer credit for a pre-calculus course
- Student's MIS* score is between 840 and 920, the student completed a pre-calculus course with a grade of B or better, and the student completed Augustana's ALEKS Prep for Calculus course

A student places into Pre-Calculus (MATH-140) if at least one of the following criteria is met:

- Student's MIS* score is 840 or above
- Student completed MATH-090 with a grade of A
- Student has transfer credit for a college algebra course
- Student completed Augustana's ALEKS Prep for Precalculus course

A student places into Preparation for College Mathematics (MATH-090) if ALL of the following criteria are met:

- Student's MIS is below 840
- Student is a first year incoming student in fall term
- Student's intended major field of study requires that they take Precalculus (MATH-140)

Note that MATH-090 is only offered fall term.

*A student's Math Index Score (MIS) is calculated using the student's high school GPA and their math subscore on the ACT or SAT exam. More information about MIS scores and ALEKS can be found at https://www.augustana.edu/information-new-students/orientation/placement-charts and https://www.augustana.edu/academics/aleks

A major in applied mathematics is 34 credits in MATH, including MATH-160, MATH-220, MATH-250, MATH-260, MATH-320, MATH-340, MATH-460; at least one of MATH-330 or MATH-350; and one elective at 300 - 400 level. In addition, CSC-201 and 8 additional credits from an area outside of MATH (specified later in this document). (Total of 46 credits)

A grade of C or better is required for each prerequisite course.

Required Courses

Course Number	Course Name	Learning Perspective	Prerequisites	Credits
MATH-160	Calculus		MIS placement or MATH-140	4
MATH-220	Integration: Techniques and Applications		MATH-160	2
MATH-250	Discrete Mathematics		MATH-160	4
MATH-260	Multivariable Calculus		MATH-160	4
MATH-320	Differential Equations		MATH-220	4
MATH-340	Mathematical Modeling		MATH-250, CSC-201	4
MATH-460	Senior Inquiry: Applied Mathematics		MATH-260, MATH-320 & MATH-340	4
CSC-201	Introduction to Computer Science		At least placement into pre-calculus or completion of MATH-090 with grade of A	4
One of:				
MATH-350	Linear Algebra		MATH-250	4
MATH-330	Probability and Statistics		MATH-250	4
One elective at 300 - 400 level (additional choices listed in the next chart)				

Additional Mathematics Courses for Elective

Course Number	Course Name	Learning Perspective	Prerequisites	Credits
MATH-310	Introduction to Cryptography		MATH-250, CSC-201	4
MATH-360	Complex Variables		MATH-260	4
MATH-410	Real Analysis		MATH-350	4
MATH-430	Advanced Statistics		MATH-330	4
MATH-440	Numerical Methods		MATH-230, CSC-201	4
MATH-450	Algebraic Structures		MATH-350	4
MATH-470	Foundations of Geometry	PH	MATH-350	4
MATH-480	Advanced Topics		Permission of instructor	4

Additional Courses from area outside of MATH (8 credits from one area)

Course Number	Course Name	Learning Perspective	Prerequisites	Credits
Accounting: 8 credits in ACCT including 4 credits from:				
ACCT-311	Accounting Information Systems		ACCT-201, ACCT-202	4
ACCT-321	Intermediate Accounting		ACCT-201, ACCT-202	4
ACCT-314	Tax Accounting		ACCT-201, ACCT-202	4
Biology: 8 credits in BIOL including 4 credits from:				
BIOL-310	Evolutionary Biology		BIOL-250	4
BIOL-375	Molecular Biology		BIOL-250	4
BIOL-386	Ecology		BIOL-130, BIOL-140	4
BIOL-387	Aquatic Biology		BIOL-130, BIOL-140	4
Business: 8 credits in BUSN including 4 credit from:				
BUSN-313	Operations Management		BUSN-212, BUSN-200	4
BUSN-324	Marketing Research Methods		BUSN-205, BUSN-212, BUSN-321	4

BUSN-325	Digital Marketing Analytics		BUSN-211, BUSN-321	4
BUSN-334	Security Analysis & Portfolio Management		BUSN-205, BUSN-332	4
BUSN-335	Options & Other Derivatives		BUSN-332	4
Computer Science: 8 credits in CSC including 4 credits from:				
CSC-310	Database Systems		CSC-201	4
CSC-320	Principles of Artificial Intelligence		CSC-202, MATH-250	4
CSC-371	Algorithms & Computational Theory		CSC-202, MATH-250	4
Chemistry: 8 credits in CHEM including 4 credits from:				
CHEM-361	Physical Chemistry: Thermodynamics & Kinetics		CHEM-131 or CHEM-235, PHYS-102 or PHYS-202	4
CHEM-365	Physical Chemistry II: Quantum Chemistry & Spectroscopy		CHEM-131 or CHEM-235, PHYS-102 or PHYS-202	4
Economics: 8 credits in ECON including 4 credits from:				
ECON-301	Intermediate Macroeconomics		ECON-200	4
ECON-302	Intermediate Macroeconomics		ECON-200	4
Geography: 8 credits in GEOG including 4 credits from:				
GEOG-372	Digital Cartography and Design			4
GEOG-375	Applied Environmental GIS		GEOG-100 or GEOG-273 or GEOG-274	4
GEOG-475	Advanced GIS		GEOG-273 or GEOG-274	4
Geology: 8 credits in GEOL including 4 credits from:				
GEOL-309	Geomorphology		GEOL-101 or GEOL-105	4
GEOL-330	Hydrogeology		GEOL-101 or GEOL-105	4
GEOL-360	Petrology		GEOL-205	4
Physics: 8 credits in PHYS including 4 credits from:				
PHYS-300	Optics		PHYS-212	4

PHYS-313	Thermodynamics		PHYS-212, MATH-220	4
PHYS-360	Classical Mechanics		PHYS-211, PHYS-212, MATH-260	4
PHYS-377	Electricity and Magnetism		PHYS-211, PHYS-212, MATH-260	4
PHYS-401	Introductory Quantum Physics		PHYS-213, MATH-260	4

The Minor in Mathematics

A minor in mathematics is 20 credits, including MATH-160, MATH-250, MATH-350 and two electives at least one of which must be at the 300 - 400 level.

See the Major in Mathematics advising form for details.

Major Overview

Students majoring in applied mathematics have access to a wide array of internships, employment opportunities, and continued education. Summer internships that our students have participated in include: the Texas Medical Center (at Baylor College of Medicine), John Deere, Caterpillar, Horace Mann (actuarial training), Fermilab, and more. We also have successfully placed our students into graduate programs in mathematics (or closely related disciplines) at Dartmouth, Baylor, Miami University, Illinois State University, and University of Iowa to name a few. The majority of applied math majors graduate with a career path in a scientific, economic, or teaching related field. Our majors have acquired full-time employment at the following companies: United Airlines, Horace Mann, State Farm, Prudential, and more.

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