

APPLIED MATHEMATICS (PLEASE SEE NOTE BELOW)

NOTE: Admission to this program was discontinued effective October 5, 2021 and a teach-out plan is in place for current students.

Home Department: Mathematics

Department Head:

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Applied Mathematics Program Curriculum Requirements

Code	Title	Credit Hours
First Year Experience		
CILE-101	First Year Foundations	1
General Education		
COMM-101	Rhetoric & Writing	4
ECON-201	Economic Principles	4
LS-201	Sophomore Seminar: Exploring the Human Condition	4
LS-489	Senior Seminar: Leadership, Ethics, and Contemporary Issues	4
Advanced Humanities Electives ¹		8
Advanced Social Science Electives ¹		8
Total Credit Hours		33

¹ Humanities and Social Science advanced electives must be selected from approved 300 and 400 level courses.

Code	Title	Credit Hours
Computer Programming		
Select one of the following:		4
CS-101	Computing & Algorithms I	
ECE-101	MATLAB and C Programming	
IME-211	Algorithms and Computer Programming	
<i>Credit Hours Subtotal:</i>		4
Basic Science		
CHEM-135 & CHEM-136	Principles of Chemistry and Principles of Chemistry Lab	4
PHYS-114 & PHYS-115	Newtonian Mechanics and Newtonian Mechanics Laboratory	4
PHYS-224 & PHYS-225	Electricity and Magnetism and Electricity and Magnetism Laboratory	4
<i>Credit Hours Subtotal:</i>		12

Mathematics		
MATH-101	Calculus I	4
or MATH-101X	Calculus I	
MATH-102	Calculus II	4
or MATH-102X	Calculus II	
MATH-203	Multivariate Calculus	4
or MATH-203X	Multivariate Calculus	
MATH-204	Differential Equations & Laplace Transforms	4
MATH-305	Numerical Methods and Matrices	4
MATH-307	Matrix Algebra	4
MATH-308	Abstract Algebra	4
MATH-313	Boundary Value Problems	4
MATH-321	Real Analysis I	4
MATH-327	Probability & Stochastic Modeling	4
MATH-412	Complex Variables	4
MATH-416	Vector Analysis	4
<i>Credit Hours Subtotal:</i>		48

Concentration	
Select one of the following concentrations:	28-36
(Courses for each concentration are listed in the Plan of Study Tab)	
Actuarial Science	
Applied and Computational Mathematics	
Applied Statistics	
Mathematical Biology	
<i>Credit Hours Subtotal:</i>	
	28-36

Electives	
Science Electives	8
Free Electives	16-24
<i>Credit Hours Subtotal:</i>	
	24-32

Culminating Undergraduate Experience		
CILE-400	Culminating Undergraduate Experience: Thesis ²	4

(Minimum) Total Credits Required for Program: 161

² Students are automatically registered for CILE-400 in a co-op term when they reach Junior II status.

Representative Program

Course	Title	Credit Hours
Freshman I		
CILE-101	First Year Foundations	1
CHEM-135	Principles of Chemistry	3
CHEM-136	Principles of Chemistry Lab	1
COMM-101	Rhetoric & Writing	4
MATH-101	Calculus I	4
Select one of the following:		4
CS-101	Computing & Algorithms I	
IME-211	Algorithms and Computer Programming	

ECE-101	MATLAB and C Programming	
Credit Hours		17
Freshman II		
ECON-201	Economic Principles	4
MATH-102	Calculus II	4
MATH-307	Matrix Algebra	4
PHYS-114	Newtonian Mechanics	3
PHYS-115	Newtonian Mechanics Laboratory	1
Credit Hours		16
Sophomore I		
MATH-203	Multivariate Calculus	4
MATH-308	Abstract Algebra	4
LS-201	Sophomore Seminar: Exploring the Human Condition	4
PHYS-224	Electricity and Magnetism	3
PHYS-225	Electricity and Magnetism Laboratory	1
Credit Hours		16
Sophomore II		
MATH-204	Differential Equations & Laplace Transforms	4
MATH-327	Probability & Stochastic Modeling	4
Science Elective		4
Free Elective		4
Credit Hours		16
Total Credit Hours		65

Actuarial Science Concentration

Course	Title	Credit Hours
Junior I		
MATH-258	Probability and Statistics	4
MATH-313	Boundary Value Problems	4
MATH-350	Financial Mathematics	4
BUSN-221	Financial Accounting	4
Advanced Communications Elective		4
Credit Hours		20
Junior II		
MATH-305	Numerical Methods and Matrices	4
MATH-321	Real Analysis I	4
ECON-342	Intermediate Microeconomics: Managerial Economics	4
Advanced Humanities Elective		4
Free Elective		4
Credit Hours		20
Senior I		
MATH-427	Statistical Inference & Modeling	4
MATH-360	Life Contingencies I	4
MATH-416	Vector Analysis	4
Science Elective		4
Advanced Social Science Elective		4
Credit Hours		20
Senior II		
MATH-361	Life Contingencies II	4

MATH-412	Complex Variables	4
ECON-344	Intermediate Macroeconomics: Economic Growth and Fluctuation	4
Free Elective		4
Credit Hours		16
Senior III		
MATH-450	Statistics for Risk Modeling	4
BUSN-331	Financial Management	4
LS-489	Senior Seminar: Leadership, Ethics, and Contemporary Issues	4
Advanced Comm, Humanities or Social Science Elective		4
Credit Hours		16
Any Term		
CILE-400	Culminating Undergraduate Experience: Thesis	4
Credit Hours		4
Total Credit Hours		96

(Minimum) Total Credits Required for Program: 161

Applied and Computational Mathematics Concentration

Course	Title	Credit Hours
Junior I		
MATH-305	Numerical Methods and Matrices	4
MATH-313	Boundary Value Problems	4
Advanced Communications Elective		4
Free Elective		4
Credit Hours		16
Junior II		
MATH-328	Methods of Applied Mathematics	4
MATH-418	Intermediate Differential Equations	4
Advanced Humanities		4
Free Elective		4
Credit Hours		16
Senior I		
MATH-416	Vector Analysis	4
Engineering Applications/CS Sequence		4
Advanced Social Science Elective		4
Free Electives		8
Credit Hours		20
Senior II		
MATH-321	Real Analysis I	4
MATH-423	Partial Differential Equations	4
Engineering Applications/CS Sequence		4
Science Elective		4
Free Elective		4
Credit Hours		20
Senior III		
LS-489	Senior Seminar: Leadership, Ethics, and Contemporary Issues	4
MATH-412	Complex Variables	4
Engineering Applications/CS Sequence		8

Advanced Comm, Humanities or Social Science Elective	4
Credit Hours	20
Any Term	
CILE-400 Culminating Undergraduate Experience: Thesis	4
Credit Hours	4
Total Credit Hours	96

(Minimum) Total Credits Required for Program: 161

The student will develop an engineering applications or computer science sequence with the assistance of an academic advisor. The following are examples of a possible CS-sequence, EE-sequence, IME-sequence, MECH-sequence, and PHYS sequence.

Code	Title	Credit Hours
CS-Sequence		
CS-102	Computing & Algorithms II	4
CS-203	Computing & Algorithms III	4
CS-312	Theory of Computation	4
CS-415	Cryptography	4
EE-Sequence		
EE-210	Circuits I	3
EE-240	Electromagnetic Fields and Applications	4
EE-340	Electromagnetic Wave Propagation	4
EE-348	Electromagnetic Compatibility	4
IME-Sequence		
IME-351	Engineering Economics	4
IME-321	Operations Research I - Deterministic Models	4
IME-423	Operations Research II - Stochastic Models	4
IME-453	Tools for Managing the Supply Chain	4
MECH-Sequence		
MECH-210	Statics	4
MECH-212	Mechanics of Materials	4
MECH-310	Dynamics	4
MECH-320	Thermodynamics	4
PHYS-Sequence		
PHYS-302	Vibration, Sound and Light	4
PHYS-362	Modern Physics and Lab	4
PHYS-412	Theoretical Mechanics	4
PHYS-462	Quantum Mechanics	4

Applied Statistics Concentration

Course	Title	Credit Hours
Junior I		
MATH-258	Probability and Statistics	4
MATH-313	Boundary Value Problems	4
MATH-412	Complex Variables	4
Advanced Communications Elective		4
Credit Hours		16

Junior II		
MATH-305	Numerical Methods and Matrices	4
MATH-450	Statistics for Risk Modeling	4
Industrial/MATH Elective ¹		4
Free Elective		4
Advanced Humanities Elective		4
Credit Hours		20

Senior I		
MATH-350	Financial Mathematics	4
MATH-416	Vector Analysis	4
MATH-427	Statistical Inference & Modeling	4
Free Elective		4
Advanced Social Science Elective		4
Credit Hours		20

Senior II		
IME-471	Quality Assurance	4
IME-473	Design of Experiments	4
MATH-321	Real Analysis I	4
Free Elective		4
Science Elective		4
Credit Hours		20

Senior III		
LS-489	Senior Seminar: Leadership, Ethics, and Contemporary Issues	4
Industrial/Math Elective ¹		4
Advanced Comm, Humanities or Advanced Social Science Elective		4
Free Elective		4
Credit Hours		16

Any Term		
CILE-400	Culminating Undergraduate Experience: Thesis	4
Credit Hours		4
Total Credit Hours		96

(Minimum) Total Credits Required for Program: 161

¹ The student should select at least two IME/MATH electives from the following courses: IME-321, IME-422, IME-423, and MATH-428.

Mathematical Biology Concentration

Course	Title	Credit Hours
Junior I		
MATH-313	Boundary Value Problems	4
Advanced Chemistry Elective		4
Advanced Communications Elective		4
Advanced Humanities Elective		4
Credit Hours		16
Junior II		
MATH-328	Methods of Applied Mathematics	4
MATH-418	Intermediate Differential Equations	4
BIOL-241	Human Biology	3

BIOL-242	Human Biology Lab	1
Advanced Social Science Elective		4
Free Elective		4
Credit Hours		20
Senior I		
MATH-258	Probability and Statistics	4
MATH-416	Vector Analysis	4
BIOL-341	Anatomy and Physiology	4
Science Elective		4
Advanced Comm, Humanities or Advanced Social Science Elective		4
Credit Hours		20
Senior II		
MATH-321	Real Analysis I	4
MATH-330	Biostatistics	4
BIOL-381	Molecular Biology	4
BIOL-382	Molecular Biology Lab	3
Free Elective		4
Credit Hours		19
Senior III		
BIOL-351	Genetics	4
LS-489	Senior Seminar: Leadership, Ethics, and Contemporary Issues	4
MATH-412	Complex Variables	4
Free Electives		8
Credit Hours		20
Any Term		
CILE-400	Culminating Undergraduate Experience: Thesis	4
Credit Hours		4
Total Credit Hours		99

(Minimum) Total Credits Required for Program: 161