MATHEMATICS MAJOR

Program Director: Larry Washington, Ph.D.

The program in Mathematics leads to a degree of Bachelor of Science in Mathematics and offers students training in preparation for graduate work, teaching, and positions in government or industry. Mathematical training is integrated with computer use in several courses. Because a strong mathematical background is important in many fields, over half of UMCP Mathematics majors are double majors. Additional information on these topics and mathematics is available from the departmental website.

Placement in Courses

The Department of Mathematics has a large offering to accommodate a great variety of background, interests, and abilities. The department permits students to take any course for which they have the appropriate background, regardless of formal course work. For example, students with a high school calculus course may be permitted to begin in the middle of the calculus sequence even if they do not have advanced standing. Students may obtain undergraduate credit for mathematics courses in any of the following ways: passing the appropriate CEEB Advanced Placement Examination, passing standardized CLEP examinations, and through the department's credit-by-examinations. Students are urged to consult with advisors from the Department of Mathematics to assist with proper placements.

Program Objectives

The Department of Mathematics educates its majors in a broad range of modern mathematics while instilling in them a strong ability to solve problems, apply mathematics to other areas, and create rigorous mathematical arguments. The program prepares the majors to further their mathematical education in graduate school, or to teach at the secondary school level, or to work in government or business.

Program Learning Outcomes

1. Students will acquire problem-solving skills in a broad range of significant mathematics.
2. Students will gain an understanding of what constitutes mathematical thinking, including the ability to produce and judge the validity of rigorous mathematical arguments.
3. Students will be able to communicate mathematical ideas and arguments.
4. Students will be prepared to use mathematics in their future endeavors, not only in the discipline of mathematics, but also in other disciplines.

Statistics and Probability and Applied Mathematics

Courses in statistics and probability, and applied mathematics are offered by the Department of Mathematics. These courses are open to non-majors as well as majors, and carry credit in mathematics. Students wishing to concentrate in the above may do so by choosing an appropriate program under the Department of Mathematics.

REQUIREMENTS

There are four tracks for the major: the traditional track, the applied mathematics track, the secondary education track, and the statistics track. The secondary education track is for students seeking to become certified to teach mathematics at the secondary level. Each mathematics major must complete each required course with a grade of C- or better and with an overall major GPA of 2.0.

Traditional Track

Course	Title	Credits
Introductory Sequence [1]		
MATH140	Calculus I	4
MATH141	Calculus II	4
MATH240	Introduction to Linear Algebra	4
MATH241	Calculus III	4
MATH310	Introduction to Mathematical Proof	3
Select one of the following:		3
MATH246	Differential Equations for Scientists and Engineers	
MATH436	Differential Geometry of Curves and Surfaces I	
MATH462	Partial Differential Equations	
MATH/AMSC/STAT Courses		
Select eight courses of 400-level or higher; must include: [2]		
MATH410	Advanced Calculus I	3
Select one of the following:		3
MATH401	Applications of Linear Algebra	
MATH403	Introduction to Abstract Algebra	
MATH405	Linear Algebra	
MATH423	Linear Optimization	
Select one of the following:		3
AMSC460	Computational Methods	
AMSC466	Introduction to Numerical Analysis I	
Any 400-level STAT course other than STAT464		3
Select depth requirement; a one year sequence chosen from the following:		3-6
MATH410 & MATH411	Advanced Calculus I and Advanced Calculus II	
MATH410 & MATH463	Advanced Calculus I and Complex Variables	
MATH403 & MATH404	Introduction to Abstract Algebra and Field Theory	
MATH403 & MATH405	Introduction to Abstract Algebra and Linear Algebra	
STAT410 & STAT420	Introduction to Probability Theory and Theory and Methods of Statistics	
Select electives: 400-level MATH/AMSC/STAT course [3, 4]		6-9
Computer Programming Requirement		
Select one of the following:		3-4
CMSC106	Introduction to C Programming	
CMSC131	Object-Oriented Programming I	
CMSC132	Object-Oriented Programming II	
ENAE202	Computing Fundamentals for Engineers	
ENEE150	Intermediate Programming Concepts for Engineers	
PHYS265	Introduction to Scientific Programming	
Supporting three-course sequence [5]		
Select one of eight sequences		9-13
Sequence One (11 credits)		

PHYS161	General Physics: Mechanics and Particle Dynamics
PHYS260 & PHYS261	General Physics: Electricity, Magnetism and Thermodynamics and General Physics: Mechanics, Vibrations, Waves, Heat (Laboratory)
PHYS270 & PHYS271	General Physics: Waves, Optics, Relativity and Modern Physics and General Physics: Electrodynamics, Light, Relativity and Modern Physics (Laboratory)
Sequence Two (9 credits)	
PHYS171	Introductory Physics: Mechanics
PHYS272	Introductory Physics: Fields
PHYS273	Intermediate Oscillations and Waves
Sequence Three (9 credits)	
ENES102	Mechanics I
PHYS161	General Physics: Mechanics and Particle Dynamics
ENES220	Mechanics II
Sequence Four (12 credits)	
CMSC131	Object-Oriented Programming I
CMSC132	Object-Oriented Programming II
CMSC216	Introduction to Computer Systems
Sequence Five (13 credits)	
CHEM146 & CHEM177	Principles of General Chemistry and Introduction to Laboratory Practices and Research in the Chemical Sciences
CHEM237	Principles of Organic Chemistry I
CHEM247	Principles of Organic Chemistry II
Sequence Six (12 credits)	
CHEM131 & CHEM132	Chemistry I - Fundamentals of General Chemistry and General Chemistry I Laboratory
CHEM231 & CHEM232	Organic Chemistry I and Organic Chemistry Laboratory I
CHEM241 & CHEM242	Organic Chemistry II and Organic Chemistry Laboratory II
Sequence Seven (11 credits)	
ECON200	Principles of Microeconomics
ECON201	Principles of Macroeconomics
ECON305 or ECON306	Intermediate Macroeconomic Theory and Policy Intermediate Microeconomic Theory & Policy
OR	
ECON325 or ECON326	Intermediate Macroeconomic Analysis Intermediate Microeconomic Analysis
Sequence Eight (9 credits)	
BMGT220	Principles of Accounting I
BMGT221	Principles of Accounting II
BMGT340	Business Finance
Total Credits	**55-66**

[1] Or honors sequence: MATH340-MATH341.Completion of MATH340 satisfies the requirement for MATH241; completion of MATH340-MATH341 satisfies the requirement for MATH240-MATH241-MATH246.

[2] At least four courses must be taken at College Park.

[3] 400 level courses. Students with a strong interest in applied mathematics may, with the approval of the Undergraduate Office, substitute two courses (with strong mathematics content) from outside the Mathematics Department for one upper-level elective course.

[4] May not include: MATH461, MATH478, MATH480-MATH484, STAT464

[5] Intended to broaden the student's mathematical experience. (Other sequences might be approved by the Undergraduate Office but they would have to make use of mathematical ideas, comparable to the sequences on this list.)

Applied Mathematics Track

Course	Title	Credits
Introductory Sequence [1]		
MATH140	Calculus I	4
MATH141	Calculus II	4
MATH240	Introduction to Linear Algebra	4
MATH241	Calculus III	4
MATH310	Introduction to Mathematical Proof	3
Select one of the following:		3
MATH246	Differential Equations for Scientists and Engineers	
MATH436	Differential Geometry of Curves and Surfaces I	
MATH462	Partial Differential Equations	
MATH/AMSC/STAT Courses		
Select eight 400-level or higher; must include: [2]		
MATH410	Advanced Calculus I	3
STAT410	Introduction to Probability Theory	3
STAT4XX	One additional STAT course other than STAT400, STAT410, STAT464	3
MATH401	Applications of Linear Algebra	3
or MATH405	Linear Algebra	
or MATH423	Linear Optimization	
AMSC460	Computational Methods	3
or AMSC466	Introduction to Numerical Analysis I	
Select one of the following:		3
MATH416	Applied Harmonic Analysis: An Introduction to Signal Processing	
MATH420	Mathematical Modeling	
MATH424	Introduction to the Mathematics of Finance	
MATH431	Geometry for Computer Applications	
MATH452	Introduction to Dynamics and Chaos	
MATH456	Cryptography	
MATH462	Partial Differential Equations	
MATH463	Complex Variables	
MATH464	Transform Methods	
MATH475	Combinatorics and Graph Theory	
Select depth requirement; a one year sequence chosen from the following:		3
MATH410 & MATH411	Advanced Calculus I and Advanced Calculus II	
MATH410 & MATH463	Advanced Calculus I and Complex Variables	

MATH416 & MATH464	Applied Harmonic Analysis: An Introduction to Signal Processing and Transform Methods
MATH462 & MATH463	Partial Differential Equations and Complex Variables
STAT410 & STAT420	Introduction to Probability Theory and Theory and Methods of Statistics
Select electives: 400-level MATH/AMSC/STAT course [3]	

Computer Programming Requirement

Select one of the following:

CMSC106	Introduction to C Programming
CMSC131	Object-Oriented Programming I
CMSC132	Object-Oriented Programming II
ENAE202	Computing Fundamentals for Engineers
ENEE150	Intermediate Programming Concepts for Engineers
PHYS265	Introduction to Scientific Programming

Supporting Three-course Sequence [4]

Select one of twelve sequences		9-13

Sequence One (11 credits)

PHYS161	General Physics: Mechanics and Particle Dynamics
PHYS260 & PHYS261	General Physics: Electricity, Magnetism and Thermodynamics and General Physics: Mechanics, Vibrations, Waves, Heat (Laboratory)
PHYS270 & PHYS271	General Physics: Waves, Optics, Relativity and Modern Physics and General Physics: Electrodynamics, Light, Relativity and Modern Physics (Laboratory)

Sequence Two (9 credits)

PHYS171	Introductory Physics: Mechanics
PHYS272	Introductory Physics: Fields
PHYS273	Intermediate Oscillations and Waves

Sequence Three (9 credits)

ENES102	Mechanics I
PHYS161	General Physics: Mechanics and Particle Dynamics
ENES220	Mechanics II

Sequence Four (12 credits)

CMSC131	Object-Oriented Programming I
CMSC132	Object-Oriented Programming II
CMSC216	Introduction to Computer Systems

Sequence Five (13 credits)

CHEM146 & CHEM177	Principles of General Chemistry and Introduction to Laboratory Practices and Research in the Chemical Sciences
CHEM237	Principles of Organic Chemistry I
CHEM247	Principles of Organic Chemistry II

Sequence Six (12 credits)

CHEM131 & CHEM132	Chemistry I - Fundamentals of General Chemistry and General Chemistry I Laboratory
CHEM231 & CHEM232	Organic Chemistry I and Organic Chemistry Laboratory I
CHEM241 & CHEM242	Organic Chemistry II and Organic Chemistry Laboratory II

Sequence Seven (11 credits)

ECON200	Principles of Microeconomics
ECON201	Principles of Macroeconomics
ECON305	Intermediate Macroeconomic Theory and Policy
or ECON306	Intermediate Microeconomic Theory & Policy
OR	
ECON325	Intermediate Macroeconomic Analysis
or ECON326	Intermediate Microeconomic Analysis

Sequence Eight (9 credits)

BMGT220	Principles of Accounting I
BMGT221	Principles of Accounting II
BMGT340	Business Finance

Sequence Nine (12-13 credits)

BSCI170 & BSCI171	Principles of Molecular & Cellular Biology and Principles of Molecular & Cellular Biology Laboratory
BSCI160 & BSCI161	Principles of Ecology and Evolution and Principles of Ecology and Evolution Lab
CHEM131 & CHEM132	Chemistry I - Fundamentals of General Chemistry and General Chemistry I Laboratory
OR	
CHEM146 & CHEM177	Principles of General Chemistry and Introduction to Laboratory Practices and Research in the Chemical Sciences

Sequence Ten (10 credits)

ASTR120	Introductory Astrophysics - Solar System
ASTR121	Introductory Astrophysics II - Stars and Beyond [5]
PHYS161	General Physics: Mechanics and Particle Dynamics
or PHYS171	Introductory Physics: Mechanics

Sequence Eleven (12 credits)

GEOL100	Physical Geology
Select Two From:	
GEOL322	Mineralogy
GEOL340	Geomorphology
GEOL341	Structural Geology
GEOL375	Introduction to the Blue Ocean

Sequence Twelve (10 credits)

AOSC200 & AOSC201	Weather and Climate and Weather and Climate Laboratory
Two additional 400-level AOSC courses	

Total Credits	**52-56**

[1] Or honors sequence: MATH340-MATH341. Completion of MATH340 satisfies the requirement for MATH241; completion of MATH340-MATH341 satisfies the requirement for MATH240-MATH241-MATH246.

[2] At least four courses must be taken at College Park.

[3] 400 level courses. May not include: MATH461, MATH478, MATH480-MATH484, STAT464

[4] Intended to broaden the student's mathematical experience. (Other sequences might be approved by the Undergraduate Office but they would have to make use of mathematical ideas, comparable to the sequences on this list.

[5] ASTR121 is restricted to Astronomy majors, but may be open to Mathematics majors if space is available. Consequently, Mathematics majors are not guaranteed a seat in this course. Contact the Astronomy department for more information.

Secondary Education Track

Course	Title	Credits
Introductory Sequence [1]		
MATH140	Calculus I	4
MATH141	Calculus II	4
MATH240	Introduction to Linear Algebra	4
MATH241	Calculus III	4
MATH310	Introduction to Mathematical Proof	3
Select one of the following:		3-4
MATH246	Differential Equations for Scientists and Engineers	
MATH341	Multivariable Calculus, Linear Algebra, Differential Equations II (Honors)	
MATH401	Applications of Linear Algebra	
MATH420	Mathematical Modeling	
MATH452	Introduction to Dynamics and Chaos	
MATH462	Partial Differential Equations	
AMSC460	Computational Methods	
AMSC466	Introduction to Numerical Analysis I	
MATH/AMSC/STAT Courses [2]		
Select seven courses at the 400-level or higher, must include:		
MATH410	Advanced Calculus I	3
MATH430	Euclidean and Non-Euclidean Geometries	3
MATH402	Algebraic Structures	3
or MATH403	Introduction to Abstract Algebra	
STAT400	Applied Probability and Statistics I	3
or STAT410	Introduction to Probability Theory	
Select one of the following:		3
MATH406	Introduction to Number Theory	
MATH445	Elementary Mathematical Logic	
MATH446	Axiomatic Set Theory	
MATH456	Cryptography	
MATH475	Combinatorics and Graph Theory	
Select electives: 400-level MATH/AMSC/STAT course [3]		
Computer Programming Requirement		
Select one of the following:		3-4
CMSC106	Introduction to C Programming	
CMSC131	Object-Oriented Programming I	
CMSC132	Object-Oriented Programming II	
ENAE202	Computing Fundamentals for Engineers	
ENEE150	Intermediate Programming Concepts for Engineers	
PHYS265	Introduction to Scientific Programming	
Education Requirements [4]		
TLPL478	Professional Seminar in Education (TLPL478D: Professional Seminar in Education: Mathematics)	1
TLPL488	Special Topics in Education (TLPL488B: Teaching Academically, Culturally and Linguistically Diverse Students in Secondary Education)	2
TLPL489	Internship in Education (TLPL489D: Internship in Education: Mathematics)	12
Supporting Sequence [5]		
Select one of six sequences		7-8
Sequence One (8 credits)		
CHEM131 & CHEM132	Chemistry I - Fundamentals of General Chemistry and General Chemistry I Laboratory	
CHEM231 & CHEM232	Organic Chemistry I and Organic Chemistry Laboratory I	
Sequence Two (7 credits)		
PHYS161	General Physics: Mechanics and Particle Dynamics	
PHYS260 & PHYS261	General Physics: Electricity, Magnetism and Thermodynamics and General Physics: Mechanics, Vibrations, Waves, Heat (Laboratory)	
Sequence Three (8 credits)		
BSCI170 & BSCI171	Principles of Molecular & Cellular Biology and Principles of Molecular & Cellular Biology Laboratory	
BSCI160 & BSCI161	Principles of Ecology and Evolution and Principles of Ecology and Evolution Lab	
Sequence Four (7 credits)		
ASTR120	Introductory Astrophysics - Solar System	
ASTR121	Introductory Astrophysics II - Stars and Beyond	
Sequence Five (7-8 credits)		
GEOL100 & GEOL110	Physical Geology and Physical Geology Laboratory	
GEOL322	Mineralogy	
or GEOL340	Geomorphology	
or GEOL341	Structural Geology	
or GEOL375	Introduction to the Blue Ocean	
Sequence Six (7 credits)		
AOSC200 & AOSC201	Weather and Climate and Weather and Climate Laboratory	
AOSC4xx Any 400 level AOSC course		
Total Credits		**62-65**

[1] Or honors sequence: MATH340-MATH341. Completion of MATH340 satisfies the requirement for MATH241; completion of MATH340-MATH341 satisfies the requirement for MATH240-MATH241-MATH246.

[2] At least four courses must be taken at College Park.

[3] May not include: MATH461, MATH478, MATH480-MATH484, or STAT464

[4] The student-teaching courses have further prerequisites in the College of Education. In order to take these courses the student must be admitted into the College of Education. A student in the secondary education track of the mathematics major would normally be expected to receive a double major in Mathematics and Mathematics Education.

[5] These are intended to broaden the student's mathematical experience. (Other sequences might be approved by the Undergraduate Office but they would have to make use of mathematical ideas, comparable to the sequences on this list.)

Statistics Track

Course	Title	Credits
Introductory Sequence [1]		
MATH140	Calculus I	4
MATH141	Calculus II	4
MATH240	Introduction to Linear Algebra	4
MATH241	Calculus III	4
MATH310	Introduction to Mathematical Proof	3
Select one of the following:		3
MATH246	Differential Equations for Scientists and Engineers	
MATH436	Differential Geometry of Curves and Surfaces I	
MATH462	Partial Differential Equations	
MATH/AMSC/STAT Courses [2]		
Select eight courses, must include:		
MATH410	Advanced Calculus I	3
STAT410	Introduction to Probability Theory	3
STAT430	Introduction to Statistical Computing with SAS	3
AMSC460	Computational Methods	3
or AMSC466	Introduction to Numerical Analysis I	
MATH401	Applications of Linear Algebra	3
or MATH405	Linear Algebra	
or MATH423	Linear Optimization	
STAT401	Applied Probability and Statistics II	3
or STAT420	Theory and Methods of Statistics	
Select two of the following:		6
STAT4xx	Any 400-level or higher STAT courses [3]	
MATH411	Advanced Calculus II	
MATH420	Mathematical Modeling	
MATH424	Introduction to the Mathematics of Finance	
MATH464	Transform Methods	
Computer Programming Requirement		
Select one of the following:		3-4
CMSC106	Introduction to C Programming	
CMSC131	Object-Oriented Programming I	
CMSC132	Object-Oriented Programming II	
ENAE202	Computing Fundamentals for Engineers	
ENEE150	Intermediate Programming Concepts for Engineers	
PHYS265	Introduction to Scientific Programming	
Supporting Three-course Sequence [4]		
Select one of eight sequences		9-13
Sequence One (11 credits)		
PHYS161	General Physics: Mechanics and Particle Dynamics	
PHYS260 & PHYS261	General Physics: Electricity, Magnetism and Thermodynamics and General Physics: Mechanics, Vibrations, Waves, Heat (Laboratory)	
PHYS270 & PHYS271	General Physics: Waves, Optics, Relativity and Modern Physics and General Physics: Electrodynamics, Light, Relativity and Modern Physics (Laboratory)	
Sequence Two (9 credits)		
PHYS171	Introductory Physics: Mechanics	
PHYS272	Introductory Physics: Fields	
PHYS273	Intermediate Oscillations and Waves	
Sequence Three (9 credits)		
ENES102	Mechanics I	
PHYS161	General Physics: Mechanics and Particle Dynamics	
ENES220	Mechanics II	
Sequence Four (12 credits)		
CMSC131	Object-Oriented Programming I	
CMSC132	Object-Oriented Programming II	
CMSC216	Introduction to Computer Systems	
Sequence Five (13 credits)		
CHEM146 & CHEM177	Principles of General Chemistry and Introduction to Laboratory Practices and Research in the Chemical Sciences	
CHEM237	Principles of Organic Chemistry I	
CHEM247	Principles of Organic Chemistry II	
Sequence Six (12 credits)		
CHEM131 & CHEM132	Chemistry I - Fundamentals of General Chemistry and General Chemistry I Laboratory	
CHEM231 & CHEM232	Organic Chemistry I and Organic Chemistry Laboratory I	
CHEM241 & CHEM242	Organic Chemistry II and Organic Chemistry Laboratory II	
Sequence Seven (11 credits)		
ECON200	Principles of Microeconomics	
ECON201	Principles of Macroeconomics	
ECON305	Intermediate Macroeconomic Theory and Policy	
or ECON306	Intermediate Microeconomic Theory & Policy	
OR		
ECON325	Intermediate Macroeconomic Analysis	
or ECON326	Intermediate Microeconomic Analysis	
Sequence Eight (9 credits)		
BMGT220	Principles of Accounting I	
BMGT221	Principles of Accounting II	
BMGT340	Business Finance	
Total Credits		**58-63**

[1] Or honors sequence: MATH340-MATH341.Completion of MATH340 satisfies the requirement for MATH241; completion of MATH340-MATH341 satisfies the requirement for MATH240-MATH241-MATH246.

[2] At least four courses must be taken at College Park.

[3] except STAT464

[4] Intended to broaden the student's mathematical experience. (Other sequences might be approved by the Undergraduate Office but they would have to make use of mathematical ideas comparable to the sequences on this list.)

Other Requirements for the Major

Areas of Study

Within the Department of Mathematics there are a number of identifiable areas which students can pursue to suit their own goals and interests.

They are briefly described below. Note that they do overlap and that students need not confine themselves to one of them.

1. Pure Mathematics

Courses that belong to this area include:

Course	Title	Credits
MATH402	Algebraic Structures	3
MATH403	Introduction to Abstract Algebra	3
MATH404	Field Theory	3
MATH405	Linear Algebra	3
MATH406	Introduction to Number Theory	3
MATH410	Advanced Calculus I	3
MATH411	Advanced Calculus II	3
MATH430	Euclidean and Non-Euclidean Geometries	3
MATH432	Introduction to Topology	3
MATH436	Differential Geometry of Curves and Surfaces I	3
MATH437	Differential Forms	3
MATH445	Elementary Mathematical Logic	3
MATH452	Introduction to Dynamics and Chaos	3
MATH456	Cryptography	3
STAT410	Introduction to Probability Theory	3
STAT420	Theory and Methods of Statistics	3

Students preparing for graduate school in mathematics should include:

Course	Title	Credits
MATH403	Introduction to Abstract Algebra	3
MATH405	Linear Algebra	3
MATH410	Advanced Calculus I	3
MATH411	Advanced Calculus II	3
MATH463	Complex Variables	3
or MATH660	Complex Analysis I	
MATH432	Introduction to Topology (is also desirable)	3
or MATH730	Fundamental Concepts of Topology	

Other courses from the above list and graduate courses are also appropriate.

2. Secondary Teaching

In addition to the courses required by the Secondary Education Track, the following courses are particularly suited for students preparing to teach:

Course	Title	Credits
MATH401	Applications of Linear Algebra	3
MATH406	Introduction to Number Theory	3
MATH445	Elementary Mathematical Logic	3
MATH470	Mathematics for Secondary Education	3
MATH475	Combinatorics and Graph Theory	3

Students who are interested in secondary teaching should contact also the College of Education for certification requirements and other information: www.education.umd.edu/studentinfo (https://academiccatalog.umd.eduHTTP://www.education.umd.edu/studentinfo/).

3. Statistics

For a student with a Bachelor's degree seeking work requiring some statistical background, the minimal program is STAT400-STAT401. To work primarily as a statistician, one should combine STAT400-STAT401 with STAT430 and at least one more statistics course, most suitably, STAT440.   A deeper sequence is STAT410, STAT420, STAT430. This offers a better understanding and wider knowledge of statistics and is a general purpose program (i.e., does not specify one area of application).   For economics applications,

MATH424, STAT400, STAT401, STAT430, STAT440 should be considered. To prepare for graduate work, STAT410 and STAT420 give the best background, with STAT430, STAT440 added at some later stage.

4. Computational Mathematics

There are a number of math courses which emphasize the computational aspects of mathematics including the use of the computer. They are:

Course	Title	Credits
AMSC460	Computational Methods	3
AMSC466	Introduction to Numerical Analysis I	3
MATH431	Geometry for Computer Applications	3
MATH456	Cryptography	3
MATH475	Combinatorics and Graph Theory	3
STAT430	Introduction to Statistical Computing with SAS	3

Students interested in this area should take the CMSC supporting sequence as soon as possible.

5. Applied Mathematics

The courses that lead most rapidly to applications are the courses listed above in 3 and 4 and

Course	Title	Credits
MATH401	Applications of Linear Algebra	3
MATH416	Applied Harmonic Analysis: An Introduction to Signal Processing	3
MATH420	Mathematical Modeling	3
MATH452	Introduction to Dynamics and Chaos	3
MATH462	Partial Differential Equations	3
MATH464	Transform Methods	3

A student interested in applied mathematics should obtain, in addition to a solid training in mathematics, a good knowledge of at least one area in which mathematics is currently being applied. Concentration in this area is good preparation for employment in government and industry or for graduate study in applied mathematics.

GRADUATION PLANS

Click here (https://cmns.umd.edu/undergraduate/advising-academic-planning/academic-planning/four-year-plans/four-year-plans-gened/) for roadmaps for graduation plans in the College of Computer, Mathematical, and Natural Sciences.

Additional information on developing a graduation plan can be found on the following pages:

- http://4yearplans.umd.edu
- the Student Academic Success-Degree Completion Policy (https://academiccatalog.umd.edu/undergraduate/registration-academic-requirements-regulations/academic-advising/#success) section of this catalog