

MATHEMATICS (APPLIED MATHEMATICS) - BACHELOR OF SCIENCE

The Applied Mathematics concentration is intended to prepare students planning a mathematically oriented career upon graduation. The coursework in this concentration provides a foundation in mathematics important in many scientific and engineering applications.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		
<i>English Composition - Level 1</i>		
ENGL 1110G	Composition I	4
<i>English Composition - Level 2</i>		
Choose one from the following:		3
ENGL 2130G	Advanced Composition	
ENGL 2210G	Professional and Technical Communication Honors	
ENGL 2215G	Advanced Technical and Professional Communication	
<i>Oral Communication</i>		
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
<i>Area II: Mathematics</i>		
MATH 1511G	Calculus and Analytic Geometry I (Departmental/College Requirement) ¹	4
	or MATH 1511H	Calculus and Analytic Geometry I Honors
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i> 10-11		
Area III: Laboratory Sciences Course (4 credits) ²		
Area IV: Social/Behavioral Sciences Course (3 credits) ²		
Either an Area III/IV: Laboratory Sciences or Social/Behavioral Sciences Course (4 credits or 3 credits) ²		
<i>Area V: Humanities</i> ²		
<i>Area VI: Creative and Fine Arts</i> ²		
<i>General Education Elective</i>		
MATH 1521G	Calculus and Analytic Geometry II (Departmental/College Requirement)	4
	or MATH 1521H	Calculus and Analytic Geometry II Honors
Viewing a Wider World ³		
Departmental/College Requirements		
MATH 1531	Introduction to Higher Mathematics	3
MATH 2415	Introduction to Linear Algebra	3
MATH 2530G	Calculus III	3
MATH 3140	Introduction to Numerical Methods	3

MATH 3160	Introduction to Ordinary Differential Equations	3
MATH 4210	Complex Variables	3
MATH 4220	Fourier Series and Boundary Value Problems	3
STAT 3110	Statistics for Engineers and Scientists	3
STAT 4210	Probability: Theory and Applications	3
<i>Departmental Electives</i>		
Select at least 6 credits of approved additional upper-division courses prefixed MATH or STAT (one must be 400-level), excluding the following:		6
MATH 3997	Directed Readings	
MATH 4991	Undergraduate Research	
MATH 4997	Directed Reading	
STAT 400	Undergraduate Research	
Non-Departmental Requirements (in addition to Gen.Ed/VWW)		
C S 172	Computer Science I (C- or better)	4
Select a minimum of 9 credit hours of electives to form a coherent cluster in an applied area from the following: ⁴		9
Examples of acceptable clusters:		
<i>Signals</i>		
E E 320	Signals and Systems I	
E E 395	Introduction to Digital Signal Processing	
E E 496	Introduction to Communication Systems	
<i>Structures</i>		
PHYS 1310G	Calculus-Based Physics I ⁵	
C E 233	Mechanics-Statics	
C E 315	Structural Analysis	
<i>Operations Research</i>		
I E 311	Engineering Data Analysis	
I E 365	Quality Control	
I E 413	Engineering Operations Research I	
I E 423	Engineering Operations Research II	
I E 460	Evaluation of Engineering Data	
<i>Algorithm Theory</i>		
C S 272	Introduction to Data Structures	
C S 370	Compilers and Automata Theory	
C S 372	Data Structures and Algorithms	
<i>Bioinformatics</i>		
BIOL 2110G	Principles of Biology: Cellular and Molecular Biology ⁵	
BIOL 2110L	Principles of Biology: Cellular and Molecular Biology Laboratory ⁵	
C S 486	Bioinformatics	
Choose one from the following:		
C S 272	Introduction to Data Structures	
C S 370	Compilers and Automata Theory	
C S 371	Software Development	
C S 372	Data Structures and Algorithms	
<i>Computer Systems</i>		
C S 271	Object Oriented Programming	
	or C S 272	Introduction to Data Structures
C S 371	Software Development	
C S 370	Compilers and Automata Theory	
C S 474	Operating Systems I	
C S 475	Artificial Intelligence I	
C S 476	Computer Graphics I	
C S 482	Database Management Systems I	
C S 484	Computer Networks I	

C S 485	Human-Centered Computing	
Second Language Requirement: (not required)		
Electives, to bring the total credits to 120⁶		34
9-15 credits must be Upper-Division		
Total Credits		120-121

- ¹ MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1511G first.
- ² See the General Education (<https://catalogs.nmsu.edu/nmsu/general-education-viewing-wider-world/>) section of the catalog for a full list of courses.
- ³ See the Viewing a Wider World (<https://catalogs.nmsu.edu/nmsu/general-education-viewing-wider-world/#viewingawiderworldtext>) section of the catalog for a full list of courses.
- ⁴ A grade of C- or better must be earned. Students may propose clusters subject to departmental approval. A cluster must contain C S 172 Computer Science I. A major or minor in any of the following fields (along with C S 172 Computer Science I) will also fulfill the Cluster Electives requirement: Computer Science, Physics, Biology, Chemistry and Biochemistry, Chemical Engineering, Engineering Physics, Electrical and Computer Engineering, Industrial Engineering, Mechanical Engineering, Civil Engineering, Economics and Finance.
- ⁵ If these courses are selected, they could count towards the General Education Area III requirement.
- ⁶ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

Second Language Requirement

For the Bachelor of Science with a major in Mathematics with a Concentration in Applied Mathematics, there is no second language requirement for the degree.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1511G Calculus and Analytic Geometry I and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and english. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

Some students may be able to bypass one or more courses in the calculus sequence MATH 1511G - MATH 1521G - MATH 2530G. The calculus sequence, Introduction to Higher Mathematics, and Linear Algebra provide knowledge that is basic to further work, and students are advised to complete them or their equivalent as early as possible.

First Year		Credits
ENGL 1110G	Composition I (C- or better)	4
MATH 1511G	Calculus and Analytic Geometry I (C- or better)	4
or MATH 1511H	¹ or Calculus and Analytic Geometry I Honors	
Area III: Laboratory Science Course ²		4
C S 172	Computer Science I (C- or better)	4

Choose one from the following:		3
ENGL 2130G	Advanced Composition	
ENGL 2210G	Professional and Technical Communication Honors	
ENGL 2215G	Advanced Technical and Professional Communication	
MATH 1521G	Calculus and Analytic Geometry II (C- or better)	4
or MATH 1521H	or Calculus and Analytic Geometry II Honors	
Either an Area III/IV: Laboratory Science Course or Social/Behavioral Science Course ²		3-4
Area V: Humanities Course ²		3
Elective Course ³		1
Credits		30-31

Second Year		3
Choose one from the following:		
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
Area VI: Creative and Fine Arts Course ²		3
MATH 2415	Introduction to Linear Algebra (C- or better)	3
MATH 2530G	Calculus III (C- or better)	3
Elective Course(s) ³		6
Area IV: Social/Behavioral Science Course ²		3
MATH 1531	Introduction to Higher Mathematics	3
MATH 3160	Introduction to Ordinary Differential Equations	3
Cluster Course (C- or better)		3
Credits		30

Third Year		3
VWW - Viewing a Wider World Course ⁴		3
STAT 3110	Statistics for Engineers and Scientists (C- or better)	3
MATH 4210	Complex Variables (C- or better)	3
Cluster Course (C- or better)		6
Elective Course(s) ^{3,5}		9
MATH 3140	Introduction to Numerical Methods (C- or better)	3
MATH 4220	Fourier Series and Boundary Value Problems (C- or better)	3
Credits		30

Fourth Year		3
VWW - Viewing a Wider World ⁴		3
MATH/STAT Elective Course: 300/3000-level or higher (C- or better) ^{6,7}		3
STAT 4210	Probability: Theory and Applications (C- or better)	3
Elective Course - Upper Division ³		12
MATH/STAT Elective Course: 400/4000-level (C- or better) ⁷		3
Elective Course(s) ³		6
Credits		30
Total Credits		120-121

¹ Math Placement: MATH 1511G Calculus and Analytic Geometry I is the starting Math course for the degree, however, students may need to complete any prerequisites prior to enrolling into this course.

² See the General Education (<https://catalogs.nmsu.edu/nmsu/general-education-viewing-wider-world/>) section of the catalog for a full list of courses.

- ³ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.
- ⁴ See the Viewing a Wider World (<https://catalogs.nmsu.edu/nmsu/general-education-viewing-wider-world/#viewingawiderworldtext>) section for a full list of courses.
- ⁵ Students who plan to get a Masters in MATH should take MATH 3120 Introduction to Analysis as an elective.
- ⁶ MATH/STAT 300/3000-level courses that cannot be taken to fulfill this requirement: MATH 3997 Directed Readings.
- ⁷ MATH/STAT 400-level courses that cannot be taken to fulfill this requirement: MATH 4991 Undergraduate Research, MATH 4997 Directed Reading, STAT 400 Undergraduate Research.