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				
Area I: Communication	S			
English Composition -	English Composition - Level 1			
ENGL 1110G	Composition I	4		
English Composition -	Level 2			
Choose one from the	following:	3		
ENGL 2130G	Advanced Composition			
ENGL 2210G	Professional and Technical Communication Honors			
ENGL 2215G	Advanced Technical and Professional Communication			
Oral Communication				
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			
Area II: Mathematics				
MATH 1511G	Calculus and Analytic Geometry I (Departmental/College Requirement) ¹	4		
or MATH 1511H	Calculus and Analytic Geometry I Honors			
Area III/IV: Laboratory	Sciences and Social/Behavioral Sciences	10-11		
Area III: Laborator	y Sciences Course (4 credits) ²			
Area IV: Social/Bel	navioral Sciences Course (3 credits) ²			
	V: Laboratory Sciences or Social/Behavioral 4 credits or 3 credits) ²			
Area V: Humanities ²		3		
Area VI: Creative and F	ïne Arts ²	3		
General Education Elec	tive			
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		6		
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 MATH 4210	Introduction to Ordinary Differential Equations	3
	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
Departmental Elective		
	dits of approved additional upper-division courses FAT (one must be 400-level), excluding the	(
MATH 3997	Directed Readings	
MATH 4991	Undergraduate Research	
MATH 4997	Directed Reading	
STAT 400	Undergraduate Research	
Non-Departmental F	Requirements (in addition to Gen.Ed/VWW)	
C S 172	Computer Science I (C- or better)	4
	f 9 credit hours of electives to form a coherent area from the following: ⁴	Q
Examples of accepta	able clusters:	
Signals		
E E 320	Signals and Systems I	
E E 395	Introduction to Digital Signal Processing	
E E 496	Introduction to Communication Systems	
Structures		
PHYS 1310G	Calculus -Based Physics I ⁵	
C E 233	Mechanics-Statics	
C E 315	Structural Analysis	
Operations Research	of dotard / maryolo	
IE 311	Engineering Data Analysis	
I E 365	Quality Control	
I E 413		
I E 423	Engineering Operations Research I Engineering Operations Research II	
I E 460		
	Evaluation of Engineering Data	
Algorithm Theory C S 272	Introduction to Data Structures	
C S 370		
	Compilers and Automata Theory	
C S 372	Data Structures and Algorithms	
Bioinformatics		
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	-	
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	
Computer Systems		
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	
	Artificial Intelligence I	
C S 475		
C S 475 C S 476	Computer Graphics I	
	Computer Graphics I Database Management Systems I	

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Total Credits		120-121	
9-15 credits m	nust be Upper-Division		
Electives, to bring the total credits to 120 ⁶		34	
Second Language Requirement: (not required)			
C S 485	Human-Centered Computing		

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/generaleducation-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.
- 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 or MATH 1511H	Calculus and Analytic Geometry I (C- or better) or Calculus and Analytic Geometry I Honors	4
Area III: Laboratory Science Course ²		4
C S 172	Computer Science I (C- or better)	4

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) or MATH 1521H 4 Science Course 2 3 Area V. Humanities Course 2 3 Elective Course 3 1 Credits 300-31 Second Year 3 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 Linear Algebra (C- or better) ATH 2530G Calculus III (C- or better) 3 6 Area IV: Social/Behavioral Science Course 2 3 MATH 2530 Calculus III (C- or better) 3 MATH 1531 Introduction to Higher Mathematics 3 MATH 3160 Introduction to Ordinary Differential Equations 3 Cluster Course (C- or better) 3 3 Cluster Course (C- or better) 3 3 <th>Choose one from the</th> <th>followina:</th> <th>3</th>	Choose one from the	followina:	3
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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 Area V. Humanities Course ² 3 Elective Course ³ Credits 30.31 Second Year 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 Area V: Creative and Fine Arts Course ² 3 MATH 2415 Introduction to Communication HONOrs Area IV: Creative and Fine Arts Course ² 3 MATH 2530G Calculus III (C- or better) 3 Elective Course(s) ³ Area IV: Social/Behavioral Science Course ² 3 MATH 1531 Introduction to Inger Mathematics 3 MATH 3160 Introduction to Ordinary Differential Equations Cluster Course (C- or better) 3 STAT 3110 Statistics for Engineers and Scientists (C- or better) 4 MATH 4210 Complex Variables (C- or better) 3 Cluster Course (S - 5 9 MATH 3140 Introduction to Numerical Methods (C- or better) 4 MATH 4210 Complex Variables (C- or better) 3 MATH 3140 Introduction to Numerical Methods (C- or better) 4 MATH 4220 Fourier Series and Boundary Value Problems (C- or better) 4 MATH 4210 Proving and Boundary Value Problems (C- or better) 4 MATH 4210 Proving Science Addition A	ENGL 2215G		
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Area VI: Creative and Fine Arts Course ² MATH 2415 Introduction to Linear Algebra (C- or better) MATH 2530G Calculus III (C- or better) Elective Course(s) ³ Calculus III (C- or better) 3 Elective Course(s) 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 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 410 Introduction to Numerical Methods (C- or better) MATH 420 Fourier Series and Boundary Value Problems (C- or better) 5 Fourth Year 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) 6 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 Credits 30 Corb 2 Credits 30 Corb 2 Credits 30 Corb 2 Credits 30 Corb 3 Credits 30 Corb 3 Credits 30 Credits	COMM 1130G	Public Speaking	
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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/generaleducation-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.