

MATHEMATICS BS DEGREE REQUIREMENTS 2023-2024

OPTION II - APPLIED MATHEMATICS

Student name: _____ UNM ID: _____

Concentration: **Applied Mathematics** Minor (req): _____

Admitted to program on: _____ as a (circle one of) FR / SO / JR / SR .

Expected date of graduation: _____

Student's interests: _____

Completed Courses	Sem	Grade	Instructor	Pre-approved substitutions
Math 1512 (162) Calc 1				
Math 1522 (163) Calc 2				
Math 2531 (264) Calc 3				
Computing course at the level of ENG130L, CS 152L, PHYS 2415, or ECE 131L #1				
MATH 316 ODEs				
MATH 321 Lin Algebra				
At least 3 credits from MATH or STAT 300 - 699 #1				
MATH311 or MATH402				
MATH 312 PDEs				
MATH 313 Complex Variables				
MATH 375 Num Computing				
MATH 401 Adv Calculus I				
One from 412, 441, 462, 463, 464, *471, 472 (if MATH402 is not taken) #1				

Concentration Requirements, Reference: <https://catalog.unm.edu/catalogs/2023-2024/#/programs/r1mTQeXqs5/HyXKUQuss9?bc=true&bcCurrent=Bachelor%20of%20Science%20in%20Mathematics&bcGroup=Mathematics%20%26%20Statistics&bcItemType=programs>

- Complete all of the following
 - Complete at least 1 of the following:
 - [MATH311](#) - Vector Analysis (3)
 - [MATH402](#) - Advanced Calculus II (3)

- Complete the following:
 - [MATH312](#) - Partial Differential Equations for Engineering (3)
 - [MATH313](#) - Complex Variables (3)
 - [MATH316](#) - Applied Ordinary Differential Equations (3)
 - [MATH375](#) - Introduction to Numerical Computing (3)
- Earn at least 3 credits from the following types of courses:

Both 311 and 402 can be taken for credit. If 402 is not chosen, then the concentration must include one course from: **412, 441, 462, 463, 464, *471, 472.

- Earned at least 3 credits from MATH or STAT 300 - 699

Notes: Fall only: Math 322, 431, 441, 462, 464, 471; Spring only: Math 319, 402, 412, 421, 463, 472 {Alternate Springs}; Offered upon demand: MATH 439. For graduation, students must have 27 upper level math/stats credit hours.

Advisement History:

Date	Advised by	Semester	Recommended courses for semester

Minor Study Requirements, <https://catalog.unm.edu/catalogs/2023-2024/#/programs/SysNNI-oc?bc=true&bcCurrent=Minor%20in%20Mathematics&bcGroup=Mathematics%20%26%20Statistics&bcItemType=programs>

Minor in Mathematics

MATH 2530; 12 credit hours in Mathematics and Statistics courses numbered above 300. At least 6 of the 12 credit hours must be in courses labeled MATH. The Credit/No Credit grade option may not be used for minor study and the grades in all mathematics and statistics courses must be "C" (not "C-") or better. Courses required for a major may not be used to fulfill a minor requirement.

Minor in Statistics: Requirements for the Mathematics Major

MATH 1350 and 2530; STAT **345, 427, 428; an additional 3 credit hours of Statistics in courses numbered 300 and above. All 12 credit hours in courses 300-level and above must be in courses labeled STAT. The Credit/No Credit grade option may not be used for minor study and the grades in all statistics courses must be a "C" (not "C-") or better.

MATHEMATICS BS DEGREE REQUIREMENTS 2023 - 2024

OPTION IV - MATHEMATICS OF COMPUTATION

Student name: _____ UNM ID: _____

Concentration: **Mathematics of Computation** Minor (req): COMPUTER SCIENCE Admitted to program on: _____ as a (circle one of) FR / SO / JR / SR .

Expected date of graduation: _____

Student's interests: _____

Completed Courses	Sem	Grade	Instructor	Pre-approved substitutions
Math 1512 (162) Calc 1				
Math 1522 (163) Calc 2				
Math 2531 (264) Calc 3				
MATH 321 Linear Algebra				
Four from 312, 316, 317, 319, 322				
#1				
#2				
#3				
#4				
One from MATH 441 or STAT 345				
#1				
MATH 375 Intro Num Computing				
MATH 464 Appl Matrix				
MATH 471 Intro Scient Comp				
Computing course at the level of ENG130L, CS 152L, PHYS 2415, or ECE 131L				
#1				

Concentration Requirements

- Complete all of the following
 - Complete the following:
 - [MATH375](#) - Introduction to Numerical Computing (3)
 - [MATH464](#) - Applied Matrix Theory (3)
 - [MATH471](#) - Introduction to Scientific Computing (3)
 - Complete at least 1 of the following:
 - [MATH441](#) - Probability (3)

- [STAT345](#) - Elements of Mathematical Statistics and Probability Theory (3)
- Complete at least 4 of the following:
 - [MATH312](#) - Partial Differential Equations for Engineering (3)
 - [MATH316](#) - Applied Ordinary Differential Equations (3)
 - [MATH317](#) - Elementary Combinatorics (3)
 - [MATH319](#) - Theory of Numbers (3)
 - [MATH322](#) - Modern Algebra I (3)
- Note that MATH 401 is not required for this concentration, but is recommended for students contemplating advanced study in mathematics.
- A minor in Computer Science is required.

Reference: https://catalog.unm.edu/catalogs/2023-2024/#/programs/r1mTQeXqs5/BytU7_sj9?bc=true&bcCurrent=Bachelor%20of%20Science%20in%20Mathematics&bcGroup=Mathematics%20%26%20Statistics&bcItemType=programs

Notes: Fall only: Math 322, 441, 462, 464, 471.

Advisement History:

Date	Advised by	Semester	Recommended courses for semester

Minor Study Requirements, <https://catalog.unm.edu/catalogs/2023-2024/#/programs/SysNNI-oc?bc=true&bcCurrent=Minor%20in%20Mathematics&bcGroup=Mathematics%20%26%20Statistics&bcItemType=programs>

Minor in Mathematics

MATH 2530; 12 credit hours in Mathematics and Statistics courses numbered above 300. At least 6 of the 12 credit hours must be in courses labeled MATH. The Credit/No Credit grade option may not be used for minor study and the grades in all mathematics and statistics courses must be "C" (not "C-") or better. Courses required for a major may not be used to fulfill a minor requirement.

Minor in Statistics: Requirements for the Mathematics Major

MATH 1350 and 2530; STAT **345, 427, 428; an additional 3 credit hours of Statistics in courses numbered 300 and above. All 12 credit hours in courses 300-level and above must be in courses labeled STAT. The Credit/No Credit grade option may not be used for minor study and the grades in all statistics courses must be a "C" (not "C-") or better.

MATHEMATICS BS DEGREE REQUIREMENTS 2023 - 2024
OPTION III - MATHEMATICS EDUCATION

Student name: _____ UNM ID: _____

Concentration: **Mathematics Education** Minor (req): _____

Admitted to program on: _____ as a (circle one of) FR / SO / JR /SR

Expected date of graduation: _____

Student's interests: _____

Completed Courses	Sem	Grade	Instructor	Pre-approved substitutions
Math 1512 (162) Calc 1				
Math 1522 (163) Calc 2				
Math 2531 (264) Calc 3				
MATH 327 Intro Math thinking and Disc Structures				
MATH 305 Math Hist Persp				
MATH 321 or MATH 314 Linear Algebra				
MATH 322 Modern Algebra I				
MATH 306 College Geom				
STAT **345 Elements of Mathematical Statistics and Probability Theory				
One from MATH 316 or 375 or 412 #1				
MATH 401 Advanced Calculus I				
MATH 338 Math Second Teach				
Computing course at the level of ENG130L, CS 152L, PHYS 2415, or ECE 131L #1				

Concentration Requirements

- Complete all of the following
 - Complete the following:
 - [MATH305](#) - Mathematics from a Historical Perspective (3)
 - [MATH306](#) - College Geometry (3)
 - [MATH322](#) - Modern Algebra I (3)

- [MATH327](#) - Introduction to Mathematical Thinking and Discrete Structures (3)
- [MATH338](#) - Mathematics for Secondary Teachers (3)
- [MATH401](#) - Advanced Calculus I (4)
- [STAT345](#) - Elements of Mathematical Statistics and Probability Theory (3)
- Complete at least 1 of the following:
 - [MATH375](#) - Introduction to Numerical Computing (3)
 - [MATH412](#) - Nonlinear Dynamics and Chaos (3)
 - [MATH316](#) - Applied Ordinary Differential Equations (3)
- Complete at least 1 of the following:
 - [MATH314](#) - Linear Algebra with Applications (3)
 - [MATH321](#) - Linear Algebra (3)

Reference: <https://catalog.unm.edu/catalogs/2023-2024/#/programs/r1mTQeXqs5/HJbtUQui9?bc=true&bcCurrent=Bachelor%20of%20Science%20in%20Mathematics&bcGroup=Mathematics%20%26%20Statistics&bcItemType=programs>

Notes: *Fall* only: Math 305, 441, 462; *Spring* only: Math 306, 322, 412.

Advisement History:

Date	Advised by	Semester	Recommended courses for semester

Minor Study Requirements, <https://catalog.unm.edu/catalogs/2023-2024/#/programs/SysNNI-0c?bc=true&bcCurrent=Minor%20in%20Mathematics&bcGroup=Mathematics%20%26%20Statistics&bcItemType=programs>

Minor in Mathematics

MATH 2530; 12 credit hours in Mathematics and Statistics courses numbered above 300. At least 6 of the 12 credit hours must be in courses labeled MATH. The Credit/No Credit grade option may not be used for minor study and the grades in all mathematics and statistics courses must be "C" (not "C-") or better. Courses required for a major may not be used to fulfill a minor requirement.

Minor in Statistics: Requirements for the Mathematics Major

MATH 1350 and 2530; STAT **345, 427, 428; an additional 3 credit hours of Statistics in courses numbered 300 and above. All 12 credit hours in courses 300-level and above must be in courses labeled STAT. The Credit/No Credit grade option may not be used for minor study and the grades in all statistics courses must be a "C" (not "C-") or better.

MATHEMATICS BS DEGREE REQUIREMENTS 2023 - 2024

OPTION I - PURE MATHEMATICS

Student name: _____ UNM ID: _____

Concentration: **Pure Mathematics** Minor (req): _____

Admitted to program on: _____ as a (circle one of) FR / SO / JR / SR .

Expected date of graduation: _____

Student's interests: _____

Completed Courses	Sem	Grade	Instructor	Pre-approved substitutions
Math 1512 (162) Calc 1				
Math 1522 (163) Calc 2				
Math 2531 (264) Calc 3				
MATH 327 Intro Math thinking and Disc Structures				
MATH 321 Linear Algebra				
MATH 313 Complex Variable				
MATH 322 Modern Algebra I				
MATH 401 Advanced Calculus I				
Two from 319, 421, 431, 439, 441, 462, 472 #1				
#2				
MATH 402 (Spring) Adv Calc II				
Additional 300-level or above MATH 300 – 699 course #1				
Computing course at the level of ENG130L, CS 152L, PHYS 2415, or ECE 131L #1				

Concentration Requirements

- Complete all of the following
 - Complete the following:
 - [MATH313](#) - Complex Variables (3)
 - [MATH322](#) - Modern Algebra I (3)
 - [MATH327](#) - Introduction to Mathematical Thinking and Discrete Structures (3)

- [MATH402](#) - Advanced Calculus II (3)
- Earn at least 6 credits from the following:
 - [MATH319](#) - Theory of Numbers (3)
 - [MATH431](#) - Introduction to Topology (3)
 - [MATH439](#) - Topics in Mathematics (1 - 3)
 - [MATH441](#) - Probability (3)
 - [MATH462](#) - Introduction to Ordinary Differential Equations (3)
 - [MATH472](#) - Fourier Analysis and Wavelets (3)
 - [MATH421](#) - Modern Algebra II (3)
- Earned at least 3 credits from MATH 300 - 699
- Students who are unfamiliar with mathematical abstraction are encouraged to take **327 as early in their program as possible.

Reference: https://catalog.unm.edu/catalogs/2023-2024/#/programs/r1mTQeXqs5/Bk7KIQ_jjq?bc=true&bcCurrent=Bachelor%20of%20Science%20in%20Mathematics&bcGroup=Mathematics%20%26%20Statistics&bcItemType=programs

Notes: *Fall* only: Math 322, 431, 441, 462, 464, 471; *Spring* only: Math 319, 402, 421, 463, 472 {Alternate Springs}; Offered upon demand: **MATH 439**.

Advisement History:

Date	Advised by	Semester	Recommended courses for semester

Minor Study Requirements, <https://catalog.unm.edu/catalogs/2023-2024/#/programs/SysNNI-oc?bc=true&bcCurrent=Minor%20in%20Mathematics&bcGroup=Mathematics%20%26%20Statistics&bcItemType=programs>

Minor in Mathematics

MATH 2530; 12 credit hours in Mathematics and Statistics courses numbered above 300. At least 6 of the 12 credit hours must be in courses labeled MATH. The Credit/No Credit grade option may not be used for minor study and the grades in all mathematics and statistics courses must be "C" (not "C-") or better. Courses required for a major may not be used to fulfill a minor requirement.

Minor in Statistics: Requirements for the Mathematics Major

MATH 1350 and 2530; STAT **345, 427, 428; an additional 3 credit hours of Statistics in courses numbered 300 and above. All 12 credit hours in courses 300-level and above must be in courses labeled STAT. The Credit/No Credit grade option may not be used for minor study and the grades in all statistics courses must be a "C" (not "C-") or better.

STATISTICS BS DEGREE REQUIREMENTS 2023 - 2024

STATISTICS

Student name: _____ UNM ID: _____

Major: **Statistics** Minor (req): _____

Admitted to program on: _____ as a (circle one of) FR / SO / JR / SR .

Expected date of graduation: _____

Student's interests: _____

Completed Courses	Sem	Grade	Instructor	Pre-approved substitutions
Math 1350 (Stat 145) Intro Stats				
Math 1512 (162) Calc 1				
Math 1522 (163) Calc 2				
Math 2531 (264) Calc 3				
Computing course at the level of ENG130L, CS 152L, PHYS 2415, or ECE 131L #1				
Math 314 or 321 Lin Algebra				
Stat 345 Elem Probability				
Stat 427 Advanced Data Analysis I				
Stat 428 Advanced Data Analysis II				
Stat 440 Regression Analysis				
Stat 445 Analysis of Variance and Experimental Design				
Six hours from STAT 250 - 499 (see Note 1) #1				
#2				
Six hours 250+ (Stat courses)				

Requirements

- Complete all of the following
 - Complete the following:
 - [MATH1350](#) - Introduction to Statistics (3)
 - [MATH1512](#) - Calculus I (4)
 - [MATH1522](#) - Calculus II (4)

- [MATH2531](#) - Calculus III (4)
- Complete at least 1 of the following:
 - [MATH314](#) - Linear Algebra with Applications (3)
 - [MATH321](#) - Linear Algebra (3)
- Knowledge of an intro computing language.
- Complete the following:
 - [STAT345](#) - Elements of Mathematical Statistics and Probability Theory (3)
 - [STAT427](#) - Advanced Data Analysis I (3)
 - [STAT428](#) - Advanced Data Analysis II (3)
 - [STAT440](#) - Regression Analysis (3)
 - [STAT445](#) - Analysis of Variance and Experimental Design (3)
- Earned at least 6 credits from STAT 250 - 499
- Earn at least 6 credits from the following types of courses:

Enrichment courses: At least 6 additional credit hours of courses numbered 300 or higher and approved by the student's undergraduate advisor. These can be taken in an appropriate discipline of the student's choice, for example: anthropology, biology, business, chemistry, computer science, economics, engineering, mathematics, psychology, and statistics. These courses may overlap with the student's minor.

- For students interested in a career in actuarial science, preparation for the first actuarial exam consists of the courses MATH 1512, 1522, 2531, (**314 or **321). Preparation for the second actuarial exam consists of STAT 453, 461.
- Students planning on pursuing a graduate degree in Statistics are encouraged to take MATH **321 and 401.
- Earn at least 79 credits from the following types of courses:

Completed at least 79 credits. In addition to the program-specific requirements outlined here, all undergraduate students are required to fulfill UNM's General Education Program requirements. In some instances, courses included in an undergraduate degree program's requirement may also fulfill a General Education requirement. Please review the General Education Program in this Catalog for General Education information. Students within the College of Arts and Sciences must also complete 1) a major and a minor; or 2) two majors; or 3) one of the special curricula of the College that requires no minor.

Reference: <https://catalog.unm.edu/catalogs/2023-2024/#/programs/S17aQIm9s5?bc=true&bcCurrent=Bachelor%20of%20Science%20in%20Statistics&bcGroup=Mathematics%20%26%20Statistics&bcItemType=programs>

Notes:

1. Must be advisor approved. Options: Anth, Biol, Chem, CS, Econ, Engr, Math, Mgt, Psy, Stat
2. For students interested in a career in actuarial science, preparation for the first actuarial exam consists of the courses MATH 1512, 1522, 2530/31 and (314 or 321). Preparation for the second actuarial exam consists of the courses STAT 453 and 461.
3. Students planning on pursuing a graduate degree in Statistics are encouraged to take MATH 321 and 401.

Advisement History:

Date	Advised by	Semester	Recommended courses for semester

Minor Study Requirements, <https://catalog.unm.edu/catalogs/2023-2024/#/programs/ryWWXUbRc?expanded=Mathematics%20%26%20Statistics&bc=true&bcCurrent=Minor%20in%20Statistics&bcGroup=Mathematics%20%26%20Statistics&bcItemType=programs>

- Complete all of the following
 - Minor in Statistics: Requirements for the Mathematics Major
 - Complete the following:
 - [MATH1350](#) - Introduction to Statistics (3)
 - [STAT345](#) - Elements of Mathematical Statistics and Probability Theory (3)
 - [STAT427](#) - Advanced Data Analysis I (3)
 - [STAT428](#) - Advanced Data Analysis II (3)
 - [MATH2531](#) - Calculus III (4)
 - Earned at least 3 credits from STAT 300 - 499

Minor in Statistics

One year of calculus: MATH 1350, (1430 and 1440) or (1512 and 1522); STAT **345, 427, 428; an additional 3 credit hours of mathematics or statistics in courses numbered 250 and above. The Credit/No Credit grade option may not be used for minor study and the grades in all mathematics and statistics courses must be "C" (not "C-") or better.

Minor in Statistics: Requirements for the Mathematics Major

MATH 1350 and 2531; STAT **345, 427, 428; an additional 3 credit hours of Statistics in courses numbered 300 and above. All 12 credit hours in courses 300-level and above must be in courses labeled STAT. The Credit/No Credit grade option may not be used for minor study and the grades in all statistics courses must be a "C" (not "C-") or better.