Mathematics Curriculum Overview

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Mission:

The Norwich University Department of Mathematics seeks to promote interest in mathematics and to serve as a resource for the university community on current advances in mathematical knowledge and application. The department educates mathematics majors in preparation for civilian or military careers, and for future study in graduate schools.

The department seeks to accomplish this mission through the following activities:

- offering a sequence of courses that introduce undergraduate students in the liberal arts and social sciences to the techniques, methods, and applicability of mathematics;
- offering a basic calculus sequence to provide computer science, mathematics, science, and engineering students with the tools of mathematical analysis;
- offering introductory calculus and quantitative analysis courses to support major programs in architecture, accounting and business administration;
- integrating the use of technology in mathematics education as a tool for solving applied problems;
- offering advanced courses in mathematical theory and application leading to a major in mathematics for a Bachelor of Science degree in mathematics;
- offering a minor in mathematics that complements the major programs of study that a student may select;
- engaging students in experiential education opportunities including undergraduate research, independent study and pre-professional activities;
- offering colloquia and seminars to promote dialogue between members of the department and others of the university community;
- offering math education coursework to support students seeking secondary education licensure;
- offering financial mathematics coursework to support students seeking employment in actuarial science.

Goals:

- Prepare mathematics majors for graduate work in mathematics or careers in computer science, engineering, industry, business, actuary science, or teaching;
- Support the curricula in all disciplines;
- Supply the students with the mathematics courses necessary to qualify for teacher licensure.

Outcomes:

- Graduates will have the ability to formulate problems in the application of mathematics to various disciplines, and analyze, solve, and model solutions to these problems.
- Graduates will have a good understanding and broad knowledge of mathematics including single and multivariable calculus, linear and abstract algebra. Students will demonstrate competency in theoretical, applied, routine, and non-routine problems.
- Graduates will be prepared for successful employment in a profession employing mathematics or a profession of their choice and be well prepared for graduate or professional school.

Careers for this Major:

- Mathematician
- Statistician
- Actuary
- Data Scientist
- University Professor
- Finance
- Government

Math Major

Mathematics (B.S.) – Curriculum Map 2021-2022 Catalog

Course	Cr.	Comp.	Course	Cr.	Comp.
FRESHMAN					
Fall			**Spring**		
EN 110 Writing and Inquiry in Public Contexts	3		EN 111 Writing and Inquiry in Academic Contexts	3	
MA 121 Calculus I (General Education Math) [c1]	4		MA 122 Calculus II (General Education Math) [c1]	4	
General Education History (http://catalog.norwich.edu/residentialprogramscatalog/generaleducationgoals/#goal3humanexpressioninliteraturehistoryartshumanitiestext)	3		MA 241 Mathematical Computation and Modeling	3	
General Education Lab Science (http://catalog.norwich.edu/residentialprogramscatalog/generaleducationgoals/#goal4naturalsciencestext/)	4		Free Elective [4]	3-4	
Fall Semester Total Cr.:	**14**		**Spring Semester Total Cr.:**	**13-14**	
SOPHOMORE					
Fall			**Spring**		
EN 222 Introduction to World Literatures (Gen. Ed. Literature)	3		MA 224 Differential Equations [c1]	4	
MA 223 Calculus III [c1]	4		MA 310 Linear Algebra [c2]	3	

MA 306 Discrete Mathematics [c2]	3	Technical Elective [3,4]	4
PS 211 University Physics I	4	General Education Arts & Humanities (http://catalog.norwich.edu/residentialprogramscatalog/generaleducationgoals/#goal3humanexpressioninliteraturehistoryartshu	3
Free Elective [4]	3		
Fall Semester Total Cr.:	**17**	**Spring Semester Total Cr.:**	**14**

JUNIOR			
Fall		**Spring**	
MA 250 Communication in Mathematics	1	MA Elective (300-400 level) [c2]	3
MA 303 Advanced Calculus I [1, c2] or 309 Algebraic Structures	3	MA Elective (300-400 level) [c2]	3
MA 311 Statistical Methodology [c2]	3	MA 304 Advanced Calculus II [2] or 312 Statistical Methodology II	3
Technical Elective [3,4]	3-4	Free Elective [sa]	3
Free Elective [4,sa]	3	PH 215 Survey of Ethics (General Education Ethics)	3
General Education Social Science (http://catalog.norwich.edu/residentialprogramscatalog/generaleducationgoals/#goal5text)	3	General Education Leadership (http://catalog.norwich.edu/residentialprogramscatalog/generaleducationgoals/#goal8leadershiptext)	1-3
Fall Semester Total Cr.:	**16-17**	**Spring Semester Total Cr.:**	**16-18**

SENIOR			
Fall		**Spring**	
MA 309 Algebraic Structures [1, c2] or 303 Advanced Calculus I	3	MA Elective (300-400 level) [c2]	3
MA 411 Senior Seminars (General Education Capstone) [c2]	3	MA Elective (300-400 level) [c2]	3
Free Elective [4,sa]	3	Free Elective [sa]	3
Free Elective [4,sa]	3	Free Elective [sa]	3
Free Elective [4,sa]	3	Free Elective [sa]	3
Fall Semester Total Cr.:	**15**	**Spring Semester Total Cr.:**	**15**
TOTAL CREDITS FOR THIS MAJOR: 120-124			

[1]   MA 303 and MA 309 alternate as fall semester courses; both courses are required. For years these courses are offered, see Course Descriptions.

[2]   MA 304 and MA 312 alternate as spring semester courses; one of the two courses is required.

[3]   Technical Electives may be any non-duplicate, 3 or more credit courses from: BI, CE, CH, CS, EE, EG, ES, FN, GL, MA, ME, PS. At least one of which is at the 200 level or above; if the course is in Mathematics, it must be at the 200 level or higher exclusive of MA 232.

[4]   Technical and Free Electives credit hours are suggestions to ensure no less than 120 credit hours is achieved. The credit hours taken within each semester may vary depending on selection.

[c1]   Grade of C or higher required in 3 of the 4 courses.

[c2]   Grade of C or higher in at least 6 Math courses at the 300/400 level (other than MA 360)

[SA]   15 credits of Free Electives may be taken during a Study Abroad semester.

Math Major-Actuarial Science Conc.

Mathematics-Actuarial Science Concentration (B.S.) – Curriculum Map 2021-2022 Catalog

Course	Cr.	Comp.	Course	Cr.	Comp.
FRESHMAN					
Fall			**Spring**		
EN 110 Writing and Inquiry in Public Contexts	3		EN 111 Writing and Inquiry in Academic Contexts	3	
MA 121 Calculus I (General Education Math) [c1]	4		MA 122 Calculus II (General Education Math) [c1]	4	

General Education History (http://catalog.norwich.edu/residentialprogramscatalog/generaleducationgoals/#goal3humanexpressioninliteraturehistoryartshumanitiestext)	3	MA 241 Mathematical Computation and Modeling	3	
General Education Lab Science (http://catalog.norwich.edu/residentialprogramscatalog/generaleducationgoals/#goal4naturalsciencestext)	4	Free Elective	3-4	
Fall Semester Total Cr.:	**14**	**Spring Semester Total Cr.:**	**13-14**	

SOPHOMORE				
Fall		**Spring**		
EC 201 Principles of Economics (Macro) (General Education Social Science) [b,c]	3	EC 202 Principles of Economics (Micro) [b,c]	3	
EN 222 Introduction to World Literatures (General Education Literature)	3	MA 224 Differential Equations [c1,]	4	
MA 223 Calculus III [c1]	4	MA 310 Linear Algebra [c2]	3	
MA 306 Discrete Mathematics [c2]	3	Technical Elective [3]	3-4	
PS 211 University Physics I	4	General Education Arts & Humanities (http://catalog.norwich.edu/residentialprogramscatalog/generaleducationgoals/#goal3humanexpressioninliteraturehistoryartshumanitiestext)	3	
Fall Semester Total Cr.:	**17**	**Spring Semester Total Cr.:**	**16-17**	

JUNIOR				
Fall		**Spring**		
MA Elective	3	MA Elective (300-400 level)	3	
MA 250 Communication in Mathematics	1	MA 312 Statistical Methodology II [b,c]	3	
MA 303 Advanced Calculus I [1,c2] or 309 Algebraic Structures	3	MA 419 Internship in Mathematics (or any MA course) [2]	3	
MA 311 Statistical Methodology [b,c, c2]	3	PH 215 Survey of Ethics (General Education Ethics)	3	
Free Elective	3	General Education Leadership (http://catalog.norwich.edu/residentialprogramscatalog/generaleducationgoals/#goal8leadershiptext)	1-3	
Technical Elective [3]	3-4	Free Elective	3	
Fall Semester Total Cr.:	**16-17**	**Spring Semester Total Cr.:**	**16-18**	

SENIOR				
Fall		**Spring**		
MA 309 Algebraic Structures [1,c2] or 303 Advanced Calculus I	3	MA 321 Financial Mathematics (or any MA course) [c]	3	
MA 411 Senior Seminars (General Education Capstone) [2,c2]	3	MA Elective (300-400 level)	3	
Free Elective	3	Free Elective	3	
Free Elective	3	Free Elective	3	
Free Elective	3	Free Elective	1-3	
Fall Semester Total Cr.:	**15**	**Spring Semester Total Cr.:**	**13-15**	
TOTAL CREDITS FOR THIS MAJOR: 120-127				

[1]   MA 303 and MA 309 alternate as fall semester courses; both courses are required. For years these courses are offered, see Course Descriptions.

[2]   Students must take either MA 419 or MA 411 with an approved project on an actuarial science topic.

[3]   Technical Electives may be any non-duplicate, 3 or more credit courses from: BI, CE, CH, CS, EE, EG, ES, FN, GL, MA, ME, PS. At least one of which is at the 200 level or above; if the course is in Mathematics, it must be at the 200 level or higher exclusive of MA 232.

[b]   Grade of B- or higher to meet the Society of Actuaries Validation by Educational Experience requirement.

[c]   Grade of C or higher required.

c1   Grade of C or higher required in 3 of the 4 courses.
c2   Grade of C or higher in at least 6 Math courses at the 300/400 level (other than MA 360)

Math Major-Education Conc.

Mathematics-Education Concentration (B.S.) – Curriculum Map 2021-2022 Catalog

This major concentration is recommended to be taken with Secondary Teacher Licensure. Please review the Education major section to understand licensure requirements.

Course	Cr.	Comp.	Course	Cr.	Comp.
FRESHMAN					
Fall			**Spring**		
ED 104 Foundations of Education	3		EN 111 Writing and Inquiry in Academic Contexts	3	
General Education Lab Science (http://catalog.norwich.edu/residentialprogramscatalog/generaleducationgoals/#goal4naturalsciencestext)	4		MA 122 Calculus II (General Education Math) c1	4	
EN 110 Writing and Inquiry in Public Contexts	3		MA 241 Mathematical Computation and Modeling	3	
MA 121 Calculus I (General Education Math) c1	4		General Education History (http://catalog.norwich.edu/residentialprogramscatalog/generaleducationgoals/#goal4naturalsciencestext)	3	
PY 211 Introduction to Psychology	3		General Education Leadership (http://catalog.norwich.edu/residentialprogramscatalog/generaleducationgoals/)	1-3	
Fall Semester Total Cr.:	**17**		**Spring Semester Total Cr.:**	**14-16**	
SOPHOMORE					
Fall			**Spring**		
ED 234 Learning and Teaching Strategies	4		ED 315 Special Needs Child	3	
EN 222 Introduction to World Literatures (General Education Literature)	3		MA 224 Differential Equations c1	4	
MA 223 Calculus III c1	4		MA 310 Linear Algebra c2	3	
MA 306 Discrete Mathematics c2	3		General Education Arts & Humanities (http://catalog.norwich.edu/residentialprogramscatalog/generaleducationgoals/#goal3humanexpressioninliteraturehistoryartshu	3	
PS 211 University Physics I	4		Technical Elective [3]	3-4	
Fall Semester Total Cr.:	**18**		**Spring Semester Total Cr.:**	**16-17**	
JUNIOR					
Fall			**Spring**		
MA 250 Communication in Mathematics	1		ED 432 Curriculum and Methods of Instruction	4	
MA 303 Advanced Calculus I [1,c2] or 309 Algebraic Structures	3		MA 304 Advanced Calculus II [2] or 312 Statistical Methodology II	3	
MA 311 Statistical Methodology c2	3		Mathematics Elective, 300-400 Level	3	
MA 361 Teaching Mathematics at the Secondary Level (OR Mathematics Elective, 300-400 Level)	3		PY 352 Learning and Memory	4	
Mathematics Elective, 300-400 Level	3		SO 214 Racial and Cultural Minorities	3	
PY 324 Adolescent Psychology	3				
Fall Semester Total Cr.:	**16**		**Spring Semester Total Cr.:**	**17**	
SENIOR					
Fall			**Spring**		
MA 309 Algebraic Structures [1,c2] or 303 Advanced Calculus I	3		ED 425 Student Teaching	12	

MA 361 Teaching Mathematics at the Secondary Level (OR Mathematics Elective, 300-400 Level)	3			
MA 411 Senior Seminars (General Education Capstone) c2	3			
PH 215 Survey of Ethics (General Education Ethics)	3			
Technical Elective [3]	3-4			
Fall Semester Total Cr.:	**15-16**	**Spring Semester Total Cr.:**		**12**
TOTAL CREDITS FOR THIS MAJOR: 125-129				

[1]   MA 303 and MA 309 alternate as fall semester courses; both courses are required. For years these courses are offered, see Course Descriptions.

[2]   MA 304 and MA 312 alternate as spring semester courses; one of the two courses is required.

[3]   Technical Electives may be any non-duplicate, 3 or more credit courses from: BI, CE, CH, CS, EE, EG, ES, FN, GL, MA, ME, PS. At least one of which is at the 200 level or above; if the course is in Mathematics, it must be at the 200 level or higher exclusive of MA 232.

c1   Grade of C or higher required in 3 of the 4 courses.

c2   Grade of C or higher in at least 6 Math courses at the 300/400 level (other than MA 360).

Minor

Mathematics Minor 2021-2022 Catalog

A Mathematics major is ineligible to declare the minor. Students self-design this minor so the classes chosen blend with their major, with the advice of the Math Department. Each course requires a grade of C or higher.

Three Math Courses (higher than MA 121)	9
Three Math Courses (300-400 level)	9
Total Cr.	**18**