

# MATHEMATICS, BS

At Roosevelt, the bachelor's degree in mathematics prepares graduates for a variety of professions (<https://mathcareers.maa.org>) as well as for continuing study at the graduate level. Students will gain analytical, quantitative, and problem-solving skills. Students will also learn to apply the ideas of mathematics to other fields of knowledge and to communicate mathematics effectively.

Mathematics is a beautiful and interesting subject that involves statistics, numbers, functions, shapes, and structures. These concepts are logically interconnected and develop into a fascinating theory. They are also used to solve real world problems from a wide variety of areas, including data science, science, computer science, social science, finance, and business. The study of mathematics provides training in disciplined thought and analysis.

Students who wish to teach mathematics at the high school level should minor in secondary education and as well as take the mathematics courses included in the Concentration in Secondary Education. The Secondary Education Minor (<http://catalog.roosevelt.edu/undergraduate/humanities-education-social-sciences/minor/secondary-teacher-minor/>) page provides more detail.

## Prerequisites

All students who plan to major or minor in Mathematics must see a Math advisor before registering. Some students may need prerequisite courses. Advanced placement in Mathematics is possible for well-prepared students. All prerequisite courses must be completed with grades of C- or higher.

## Requirements

All credit must be approved by the Mathematics faculty to be applied toward the major.

- At least four of the courses beyond MATH 233 CALCULUS III must be completed at Roosevelt University.
- Courses taken as pass/fail will be given a pass only for work at or above the C- level. The average grade for all courses taken in Mathematics must be C- or higher.
- All courses presented for the major must be completed with grades of C- or higher with an overall GPA of 2.0 in the major. A maximum of two grades of C- may be presented for the major.

Requirements for a major in Mathematics leading to the BS degree consists of the core and elective courses listed below. This is 42 credit hours, although it may vary slightly for transfer students (who took, for example, a 4 credit-hour calculus 1 course).

In addition, a minor or a supporting sequence of at least 15 credit hours in a science is required. Approved areas for the BS degree are:

- Actuarial Science (<http://catalog.roosevelt.edu/undergraduate/health-science/minor/actuarial-science-minor/>)
- Biology (<http://catalog.roosevelt.edu/undergraduate/health-science/minor/biology-minor/>)
- Chemistry (<http://catalog.roosevelt.edu/undergraduate/health-science/minor/chemistry-minor/>)

- Computer Science (<http://catalog.roosevelt.edu/undergraduate/health-science/minor/computer-science-minor/>) (courses must be numbered above 115)
- Physical Science Supporting Sequence (courses must be at or above PHSC 103 GLOBAL CLIMATE CHANGE)
- Psychology (<http://catalog.roosevelt.edu/undergraduate/humanities-education-social-sciences/minor/psychology-minor/>)
- Students who transfer in 15 credits in physics may use those for the supporting sequence.

Transfer students who have taken extensive coursework in areas of science such as physics or engineering should seek approval for this supporting sequence from the chair.

A total of at least 60 credit hours in actuarial science, mathematics, computer science, the natural sciences, or psychology is required. (Note that the completion of the standard general education requirements, the major requirements, and the science minor or supporting sequence will typically result in at least 60 semester hours.)

Code	Title	Credit Hours
<b>Core</b>		
MATH 231	CALCULUS I	5
MATH 232	CALCULUS II	5
MATH 233	CALCULUS III	3
MATH 245 & MATH 290	DISCRETE STRUCTURES and INTRODUCTION TO PROOF	4
MATH 246	LINEAR ALGEBRA	3
MATH 320	INTRODUCTION TO ABSTRACT ALGEBRA	3
MATH 352	ANALYSIS	3
MATH 390	INDUSTRIAL RESEARCH PROBLEMS (EXL and Capstone Course)	3
<b>Electives for the Math B.S.</b>		
Select a course in probability or statistics		3
MATH 309	DATA MINING	
MATH 339	BASEBALL STATISTICS	
MATH 347	PROBABILITY THEORY	
MATH 348	MATHEMATICAL STATISTICS	
MATH 349	REGRESSION & TIME SERIES	
Two 300 level electives		6
<b>Concentration or Minor in approved area</b>		<b>15</b>
<b>Required programming course</b>		
CST 150	COMPUTER SCIENCE I	4
<b>General Education, University Writing Requirement, and Electives<sup>1</sup></b>		
Courses to total 120		63
Total Credit Hours		120

1. Students who wish to teach at the middle school or high school level should choose electives using the concentration in Secondary Education. Students who wish to have a statistics concentration should choose electives from the list in that section.

## Additional concentration in Secondary Education

Students pursuing a concentration in Secondary Education will take courses that prepare them for the Illinois Mathematics Content Test. They also need to register for the minor in secondary education (<http://>

catalog.roosevelt.edu/undergraduate/humanities-education-social-sciences/minor/secondary-teacher-minor/). Students should speak with both the mathematics and education departments for course advising.

### Standards

Courses taken as pass/fail will be given a pass only for work at or above the C- level. The average grade for all courses taken in mathematics must be C- or higher. In order to satisfy state teacher requirements, all courses presented for the major and the minor(s) must be completed with an overall GPA of 2.7 in the major. Repeated courses in the major or minor require specific approval.

### Requirements for the concentration

Students choosing this concentration must complete the 30 credit hours of core requirements listed above along with a minor or concentration in a science. Three additional courses are required as follows:

Code	Title	Credit Hours
<b>Courses required for the SEED concentration</b>		
MATH 316	HISTORY OF MATHEMATICS	3
MATH 317	GEOMETRY	3
Select one of the following Probability and Statistics courses:		3
MATH 217	ELEMENTARY STATISTICS	
MATH 347	PROBABILITY THEORY	
MATH 339	BASEBALL STATISTICS	
Total Credit Hours		9

### Additional concentration in Statistics

#### Requirements for the Concentration

Students choosing this concentration must complete the 30 credit hours of core requirements listed above along with a minor or concentration in a science. Four additional courses are required as follows:

Code	Title	Credit Hours
<b>Courses required for the Statistics concentration</b>		
MATH 347	PROBABILITY THEORY	3
MATH 348	MATHEMATICAL STATISTICS	3
MATH 349	REGRESSION & TIME SERIES	3
<b>Electives</b>		
Select one of the following:		3
MATH 307	DIFFERENTIAL EQUATION/MODELING	
MATH 309	DATA MINING	
MATH 323	GAME THEORY AND APPLICATIONS	
MATH 328	LINEAR PROGRAMMING & OPTIMIZATION	
MATH 339	BASEBALL STATISTICS	
MATH 369	MODELS FOR LIFE CONTINGENCIES	
Alternate courses may be approved by advisor		
MATH 389	SPECIAL TOPICS (Requires Chair approval)	
Total Credit Hours		12

## CORE Requirements (General Education)

Code	Title	Credit Hours
<b>First Year Success Course or Transfer Success Course</b>		
FYS 101	FIRST YEAR SUCCESS COURSE	1

or TRS 101	TRANSFER SUCCESS 101	
<b>Communication Requirement</b>		
ENG 101	COMPOSITION I: CRITICAL READING & WRITING	3
ENG 102	COMPOSITION II: INTRODUCTION TO ACADEMIC RESEARCH	3
COMM 101	PUBLIC SPEAKING (or program specific CORE communications course)	3
<b>Ideas of Social Justice</b>		
3 credits in coursework categorized as Ideas.		3
<b>Humanities and Fine and Performing Arts</b>		
9 credits from the following subject areas: African-American Studies, Art History, English (excluding ENG 101 and ENG 102), History, Languages, Music, Philosophy, Theatre, Communication and Women's and Gender Studies		9
<b>Mathematics</b>		
MATH 110	QUANTITATIVE LITERACY (or above) <sup>1</sup>	3
<b>Science</b>		
One biological science and one physical science required (one must include a one credit lab).		7-8
<b>Social Sciences</b>		
9 credits from the following subject areas: African-American Studies, Criminal Justice, Economics, History, Journalism, Philosophy, Political Science, Psychology, Sociology and Women's and Gender Studies		9
<b>Experiential Learning</b>		
6 credits from coursework categorized as Experiential Learning.		6
Total Credit Hours		47-48

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Higher level of Math may be required by major

These quantitative requirements also apply to degrees.

- Students must earn a minimum of 120 semester hours.
- Students may apply no more than 60 credit hours of 100-level courses toward the degree.
- Students must apply no fewer than 60 credit hours of 200- and 300-level courses toward the degree.
- Students must have at least 18 credit hours (of the 60 credit hours above) at the 300 level.
- Students may transfer in no more than 70 credit hours from community colleges.
- Students earning less than 60 total hours in residence must take their final 30 hours at Roosevelt University. Note that some majors have additional requirements for RU hours.
- Students must have a grade point average of 2.0 or higher to graduate. Note that some majors have additional GPA requirements.
- Students may apply no more than 51 hours in the major (BA) or 57 hours in the major (BS)

Your degree map is a general guide suggesting courses to complete each term on the academic pathway to your degree. It is based on the most current scheduling information from your academic program. Your program's degree map is reviewed annually and updated as schedules

change (although you retain the same course requirements as long as you are continuously enrolled in your degree program).

Always work closely with your academic advisor to understand curriculum requirements and scheduling, as each student's academic plan can look slightly different.

Year 1			
Fall	Credit Hours	Spring	Credit Hours
ENG 101		3 ENG 102	3
FYS 101		1 Ideas of Social Justice	3
MATH 121 <sup>8</sup>		3 CST 150	4
BIOL 111 or 112 <sup>2</sup>		4 MATH 122 <sup>8</sup>	3
Humanities #1		3 Physical Science <sup>2</sup>	3
			16

Year 2			
Fall	Credit Hours	Spring	Credit Hours
MATH 231 <sup>8</sup>		5 MATH 232 <sup>8</sup>	5
Humanities #2		3 MATH 246	3
Social Science #1 <sup>7</sup>		3 Social Science #2 <sup>7</sup>	3
COMM 101		3 General Elective	3
General Elective <sup>1</sup>		3	
			14

Year 3			
Fall	Credit Hours	Spring	Credit Hours
MATH 233		3 MATH 352	3
MATH 245		3 MATH 390 (EXL #1) <sup>4</sup>	3
MATH 290		1 Science Minor or Sequence <sup>5</sup>	3
Social Science #3 <sup>7</sup>		3 General Elective <sup>1</sup>	3
Humanities #3		3 MATH 320	3
Science Minor or Sequence <sup>5</sup>		3	
			15

Year 4			
Fall	Credit Hours	Spring	Credit Hours
Probability or Statistics Course		3 Science Minor or Sequence <sup>5</sup>	3
Science Minor or Sequence <sup>5</sup>		3 General Elective <sup>1</sup>	3
Science Minor or Sequence <sup>5</sup>		3 MATH 3XX <sup>3</sup>	3
Experiential Learning Course #2 <sup>4,6</sup>		3 General Elective <sup>1</sup>	3
MATH 3XX <sup>3</sup>		3 General Elective <sup>1</sup>	3
			15

Total Credit Hours 122

1 Or course towards an optional Minor.

- 2 One Natural Science course must have a lab.
- 3 Any course at the 300 level within the discipline.
- 4 Satisfies CORE Experiential Learning requirement.
- 5 See advisor for coursework; CST 150 COMPUTER SCIENCE I, BIO, PSYC, or Physical science course may count as part of this requirement depending on choice of minor or concentration. The degree plan for the SEED minor assumes one of these courses which was previously listed as part of the minor or concentration.
- 6 Experiential Learning course must be 200/300 level. MATH 349 REGRESSION & TIME SERIES is recommended.
- 7 ECON 234 ELEMENTARY STATISTICS is recommended as it can act as a prerequisite for many of the courses in the major.
- 8 Where a student begins their math sequence depends on their placement, and so some students will start in MATH 231 CALCULUS I. Students should take this sequence of courses each semester until they complete MATH 232 CALCULUS II; they should take MATH 233 CALCULUS III in the next possible fall term.

## Degree Map for the Mathematics BS with Secondary Education Concentration and Minor

Year 1			
Fall	Credit Hours	Spring	Credit Hours
ENG 101		3 ENG 102	3
FYS 101		1 Ideas of Social Justice	3
MATH 121 <sup>8</sup>		3 MATH 122 <sup>8</sup>	3
BIOL 111 or 112 <sup>2</sup>		4 Physical Science <sup>2</sup>	3
Humanities #1		3 EDUC 201	3
EDUC 101		3 ECON 234	3
			17

Year 2			
Fall	Credit Hours	Spring	Credit Hours
MATH 231 <sup>8</sup>		5 MATH 232 <sup>8</sup>	5
Humanities #2		3 MATH 246	3
COMM 101		3 Social Science #2	3
EDUC 202		3 SPED 219	3
MATH 245		3 CST 150	4
MATH 290		1	
			18

Year 3			
Fall	Credit Hours	Spring	Credit Hours
MATH 233		3 MATH 352	3

Humanities #3	3 MATH 390 (EXL course) <sup>4</sup>	3
Social Science #3	3 Science Minor or Sequence <sup>5</sup>	3
Science Minor or Sequence <sup>5</sup>	3 MATH 320	3
READ 363	3 SEED 301	3
MATH 317 or 316	3 SEED 303	3
	18	18

**Year 4**

Fall	Credit Hours	Spring	Credit Hours
Science Minor or Sequence <sup>5</sup>		3 SEED 360 (EXL course)	12
Science Minor or Sequence <sup>5</sup>	3		
SEED 323	3		
MATH 316 or 317	3		
SEED 350	3-4		
SEED 353	3		
	18-19		12

Total Credit Hours 137-138

2

One Natural Science course must have a lab.

3

Any course at the 300 level within the discipline.

4

Satisfies CORE Experiential Learning requirement.

5

See advisor for coursework; CST 150 COMPUTER SCIENCE I, BIO, PSYC, or Physical science course may count as part of this requirement depending on choice of minor or concentration. The degree plan for the SEED minor assumes one of these required courses will be used as part of the minor or concentration.

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Where a student begins their math sequence depends on their placement, and so some students will start in MATH 231 CALCULUS I. Students should take this sequence of courses each semester until they complete MATH 232 CALCULUS II; they should take MATH 233 CALCULUS III in the next possible fall term.