Guidelines for Mathematics and Statistics Majors and Minors

Saint Peter's University

Department of Mathematics and Statistics

Revised Summer 2023

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Major and Minor Offerings

The Department of Mathematics and Statistics offers three majors and two minors in Mathematics and Statistics.

- Mathematics Major - Degree of Bachelor of Science.
    - Who should consider this major: those planning to continue with graduate studies and research; those seeking industrial, corporate, or governmental work; and/or those without definite post-graduation plans.
- Mathematics Major, Secondary Education Concentration - Degree of Bachelor of Arts
    - Who should consider this major: students who want to teach at the secondary school level, or students who are looking to double major and need a program with fewer credits.
- Mathematics Major, Elementary Education Concentration - Degree of Bachelor of Arts
    - Who should consider this major: students who want to teach at the elementary or middle school level, or students who are looking to double major and need a program with fewer credits.
- Mathematics Minor
    - Who should consider this minor: those seeking industrial, corporate, or governmental work; and/or those without definite post-graduation plans. This minor is open to students in any major, however students in Computer Science, Physics, Economics, or Finance may find it especially useful.
- Statistics Minor
    - Who should consider this minor: those seeking industrial, corporate, or governmental work; and/or those without definite post-graduation plans. This minor is open to students in any major, however students in Psychology, Biology, or Business may find it especially useful.

Beginning the Mathematics Majors

If you intend to major in mathematics, you should register for either Calculus sequence (MA143/144 or MA123/124/125). In addition, you should identify yourself to your calculus instructor, who can keep you informed of special programs as well as of other important information to mathematics majors.

If you are considering mathematics as one of several possible majors, you should register for either Calculus sequence (MA143/144 or MA123/124/125). These courses fulfill the core mathematics requirement that is obligatory for all Saint Peter's students, so these courses will be applicable towards your degree for almost all majors.

If you are transferring into Saint Peter's University with credits, particularly mathematics credits, and intending to major in mathematics, you should consult with an advisor in the Department of Mathematics and Statistics as early as possible. Only in this way can your past academic records be matched with the Department's requirements.

If you are concerned about the adequacy of your high school preparation, before your first semester, you should consult with the Chairperson of the Mathematics and Statistics Department or the Director of Developmental Mathematics.

If you think that you have had a strong calculus course in high school, before your first semester, you should consult with the Chairperson of the Mathematics and Statistics Department or the Director of Developmental Mathematics. On the basis of this discussion, you may be placed directly into Multivariable Calculus (MA273 or MA274).

The Core Curriculum for Mathematics Majors

Core Requirement 3.1

- Mathematics majors pursuing the B.S. in Mathematics degree and the B.A. in Mathematics with a concentration in Secondary Education are **required** to take CS-180 or another computer programming course.
- Mathematics majors pursuing the B.A. in Mathematics with a concentration in Elementary Education are encouraged to take CS-180 or another computer programming course.
- Mathematics majors pursuing the B.S. degree are encouraged to take PC-185 General Physics I with lab. These Mathematics majors are also encouraged to take PC-186 General Physics II with lab.
- Mathematics majors pursuing the B.A. degree are encouraged to take BI-122, BI-124, BI-183, or a comparable course in Biology.

Core Requirement 2.1

- All mathematics majors are encouraged to take EC-101 Macroeconomic Principles.

Degree Requirements

Mathematics Major - Degree of Bachelor of Science

Take one of the following sequences		8
MA-143 MA-144	Differential Calculus Integral Calculus	4 4
or		
MA-123 MA-124 MA-125	Elementary Calculus I Elementary Calculus II Intermediate Calculus	3 3 2
MA-247	Introductory Linear Algebra	3
MA-248	Math Tech Lab	1
MA-250	Transition to Advanced Mathematics	3
MA-273	Multivariable Calculus I	4
MA-274	Multivariable Calculus II	4
MA-441	Modern Algebra	3
MA-490	Senior Seminar in Mathematics (Capstone)[1]	3
Take one of the following courses		3-4
MA-377 MA-379	Ordinary Differential Equation Differential Equations for Engineers	3 4
Take one of the following courses		3
MA-222 MA-335 MA-336 MA-337 MA-338 MA-389	Intermediate Statistics Probability Theory Mathematical Statistics Statistical Computing With R Regression Analysis Topics in Statistics	
MA Electives	One Mathematics or Statistics Elective (MA-212 or higher) (A cognate course may be substituted with permission.)	3
MA Electives	Three Mathematics or Statistics Electives (MA-316 or higher)	9
Total Credits		47-48

[1] Open only to students with 90+ credits.

Mathematics Major - Secondary Education Concentration - Degree of Bachelor of Arts

MA-247	Introductory Linear Algebra	3
MA-248	Math Tech Lab	1
MA-250	Transition to Advanced Mathematics	3
MA-350	College Geometry	3
MA-400	History of Mathematics	3
MA-441	Modern Algebra	3
MA-490	Senior Seminar in Mathematics[2]	3
Take at least fourteen credits in Calculus		14-16
MA-123 & MA-124 & MA-125	Elementary Calculus I and Elementary Calculus II and Intermediate Calculus (note students can only receive credit for one 100 level Calculus sequence)	3 3 2
MA-143 & MA-144	Differential Calculus and Integral Calculus (note students can only receive credit for one 100 level Calculus sequence)	4 4
MA-273 & MA-274	Multivariable Calculus I and Multivariable Calculus II	4 4
MA-375 MA-377 MA-379	Advanced Calculus Ordinary Differential Equation Differential Equations for Engineers	3 3 4
Take one course in Statistics, Probability, or Discrete Mathematics		3
MA-132 MA-212 MA-222 MA-316 MA-335 MA-336 MA-337 MA-338 MA-389	Statistics for the Life Sciences Elementary Statistics Intermediate Statistics Intermediate Discrete Mathematics Probability Theory Mathematical Statistics Statistical Computing With R Regression Analysis Topics in Statistics	
Total Credits		36-38

[2] Open only to students with 90+ credits.

Mathematics Major - Elementary Education Concentration - Degree of Bachelor of Arts

MA-250	Transition to Advanced Mathematics	3
MA-400	History of Mathematics	3
MA-490	Senior Seminar in Mathematics[3]	3
Take three courses in Essential Mathematics and Statistics		
Group 1: Essential Mathematics (choose one)		3
MA-101 MA-107 MA-218	Precalculus Topics in Contemporary Math Quantitative Methods for Business	
Group 2: Essential Statistics (choose two, one course must be number 132 or higher)		6
MA-103 MA-106 MA-132 MA-212 MA-222 MA-304 MA-336 MA-337	Probability and Statistics for Liberal Art Introduction to Probability and Statistics Statistics for the Life Sciences Elementary Statistics Intermediate Statistics Statistics, Probability and Discrete Math for Middle School Mathematical Statistics Statistical Computing With R	
Take two courses in Calculus		6-8
MA-123 & MA-124	Elementary Calculus I Elementary Calculus II (note students can only receive credit for one 100 level Calculus sequence)	3 3
MA-143 & MA-144	Differential Calculus Integral Calculus (note students can only receive credit for one 100 level Calculus sequence)	4 4
MA-273 & MA-274	Multivariable Calculus I Multivariable Calculus II	4 4
MA-375 MA-377 MA-379	Advanced Calculus Ordinary Differential Equation Differential Equations for Engineers	3 3 4

[3] Open only to students with 90+ credits.

Take one course in Algebra		3
MA-247 MA-302 MA-441	Introductory Linear Algebra Elementary Math Functions for Middle School Modern Algebra	
Take one course in Geometry		3
MA-306 MA-350	Geometry for Middle School College Geometry	
MA Elective	Take one Mathematics or Statistics Elective (200 level or higher)	3
Total Credits		33-35

Note: At least four courses must be at the 300-Level or above.

Mathematics Minor

Select one of the following calculus sequences:		6-8
MA-123 & MA-124	Elementary Calculus I and Elementary Calculus II	3 3
MA-132 & MA-133	Statistics for the Life Sciences and Calculus for the Life Sciences	3 4
MA-143 & MA-144	Differential Calculus and Integral Calculus	4 4
MA-273 & MA-274	Multivariable Calculus I and Multivariable Calculus II	4 4
Select 4 MA-courses, 200-level or above		12+
Total Credits		18-20+

Statistics Minor

Select one of the following courses		3
MA-132 MA-212	Statistics for the Life Sciences Elementary Statistics	
Select five of the following options		15
MA-222	Intermediate Statistics	
MA-335	Probability Theory	
MA-336	Mathematical Statistics	
MA-337	Statistical Computing With R	
MA-338	Regression Analysis	
MA-389	Topics in Statistics	
One from the following group		
BA-388 or BA-414 or BI-311 or CJ-350 or EC-300 or MA-304 or PO-200 or PS-200 or SO-448		
One from the following group may be taken by permission of the department chair when appropriate		
BA-351 or BI-385 or BI-497 or BI-498 or CU-400 or HS-499 or HP-492 or MA-295 or MA-399 or PC-390 or PS-398 or SO-450		
One from the following group		
MA-123 or MA-124 or MA-133 or MA-143 or MA-144 or MA-218 or MA-273 or MA-274 or MA-316 or MA-385 or MA-400		
Total Credits		18

Degree Maps

Mathematics Major - Degree of Bachelor of Science.

For a complete list of requirements, please see above.

The following degree map indicates one path through the major. However, the Department stresses that there are many routes through our major. Please consult with a member of the department to construct a degree map that meets your needs.

First Year

Fall	Spring
MA143 (4 credits) or MA123 (3 credits)	MA144 (4 credits) or MA124 (3 credits) and MA125 (2 credits)
Core Requirement Courses such as CS180 (required) or PC185 (recommended)	Core Requirement Courses such as CS180 (required) or PC186 (recommended)
Core Requirement Courses such as EC101 (recommended)	Core Requirement Courses such as EC101 (recommended)

Sophomore Year

Fall	Spring
MA273 (4 credits)	MA247 (3 credits)
MA250 (3 credits)	MA274 (4 credits) when available, offered alternate springs ending in odd numbers or an intermediate or upper level MA course
	MA248 (1 credits) when available, offered alternate springs ending in even numbers

Junior and Senior Years

During your junior and senior years you will round out your major with a variety of required courses and elective courses. **You should take two to three Mathematics courses per semester.**

Additional required intermediate and upper division courses include:

- MA248 Mathematics Technology Lab
- MA274 Multivariable Calculus II
- MA377 (or MA379) Ordinary Differential Equations
- MA441 Modern Algebra
- MA490 Senior Seminar in Mathematics
- One Statistics Class chosen from
    - MA-222 Intermediate Statistics
    - MA-335 Probability Theory
    - MA-336 Mathematical Statistics
    - MA-337 Statistical Computing With R
    - MA-338 Regression Analysis
    - MA-389 Topics in Statistics

In addition to these courses you are required to take **four Mathematics/Statistics Electives**. One of which must be at the level of 212 or higher, the remaining must be taken at the level of 316 or higher. A cognate course may be substituted with permission.

Some required intermediate and upper division courses are expected to be offered in alternate years. The expected pattern of alternation is noted in the section Expected Course Offerings.

Mathematics Major - Secondary Education Concentration - Degree of Bachelor of Arts.

For a complete list of requirements, please see above.

The following degree map indicates one path through the major. However, the Department stresses that there are many routes through our major. Please consult with a member of the department to construct a degree map that meets your needs.

First Year

Fall	Spring
MA143 (4 credits) or MA123 (3 credits)	MA144 (4 credits) or MA124 (3 credits) and MA125 (2 credits)
Core Requirement Courses such as CS180 (required) or BI183 (recommended)	Core Requirement Courses such as CS180 (required) or BI183 (recommended)
Core Requirement Courses such as EC101 (recommended)	Core Requirement Courses such as EC101 (recommended)

Sophomore Year

Fall	Spring
MA273 (4 credits)	MA247 (3 credits)
MA250 (3 credits)	MA274 (4 credits) when available, offered alternate springs ending in odd numbers or MA350 (3 credits) when available, offered alternate springs ending in even numbers
	MA248 (1 credits) when available, offered alternate springs ending in even numbers

Junior and Senior Years

During your junior and senior years you will round out your major with a variety of required courses and elective courses. **You should take one to two Mathematics courses per semester.**

Additional required intermediate and upper division courses include:

- MA248 Mathematics Technology Lab
- MA274 Multivariable Calculus II or MA377 (or MA379) Ordinary Differential Equations
- MA350 College Geometry
- MA400 History of Mathematics
- MA441 Modern Algebra
- MA490 Senior Seminar in Mathematics
- One Probability, Statistics, or Discrete Mathematics class chosen from
    - MA-132 Statistics for the Life Sciences
    - MA-212 Elementary Statistics
    - MA-222 Intermediate Statistics
    - MA-316 Intermediate Discrete Mathematics
    - MA-335 Probability Theory
    - MA-336 Mathematical Statistics
    - MA-337 Statistical Computing With R
    - MA-338 Regression Analysis
    - MA-389 Topics in Statistics

Some required intermediate and upper division courses are expected to be offered in alternate years. The expected pattern of alternation is noted in the section Expected Course Offerings.

Mathematics Major - Elementary Education Concentration - Degree of Bachelor of Arts.

For a complete list of requirements, please see above.

This is an especially flexible major. The following degree map indicates one path through the major. However, the Department stresses that there are many routes through the major. Please consult with a member of the department to construct a degree map that meets your needs.

First Year

Fall	Spring
MA107 (possible essential math requirement)	MA212 (possible essential stats requirement 1 of 2)
Core Requirement Courses such as CS180 (recommended) or BI83 (recommended)	Core Requirement Courses such as CS180 (recommended) or BI183 (recommended)
Core Requirement Courses such as EC101 (recommended)	Core Requirement Courses such as EC101 (recommended)

Sophomore Year

Fall	Spring
MA123 (3 credits) or MA143 (4 credits) (1 of 2 calculus requirement)	MA124 (3 credits) or MA144 (4 credits) (1 of 2 calculus requirement)
MA250 (3 credits) (required course)	MA247 (possible algebra requirement)

Junior and Senior Years

Fall	Spring
MA400 (required course)	MA306 (possible geometry requirement)
Math/stats elective	

Fall	Spring
MA304 (possible essential stats requirement 1 of 2)	MA490 Senior Seminar in Mathematics (required course)

Some required intermediate and upper division courses are expected to be offered in alternate years. The expected pattern of alternation is noted in the section Expected Course Offerings.

Expected Course Offerings

Please note that this information is provided for pre-planning purposes only. All offerings noted here are tentative. Unforeseen circumstances could impact the offering of a particular course; however, the department will make every effort to assure the least negative impact on students should a change in a rotation be required.

Courses Required by the Mathematics Majors

The following classes are expected to be offered every year.

Fall	**Spring**
MA250 Transitions to Advanced Math	MA247 Linear Algebra
MA273 Multivariable Calculus I	

Some required intermediate and upper division courses are expected to be offered in alternate years. The expected pattern of alternation is as follows:

Even Fall	**Odd Spring**
MA400 History of Mathematics	MA274 Multivariable Calculus II
	MA441 Modern Algebra
One or two additional upper level electives.	

Odd Fall	**Even Spring**
MA377/379 Ordinary Differential Equations	MA248 Mathematics Technology Lab
	MA350 College Geometry
One or two additional upper level electives.	

Statistics Courses

Fall	Spring
MA212 Elementary Statistics	MA212 Elementary Statistics
	MA222 Intermediate Statistics
	MA337 Statistical Computing With R

MA214, MA216, MA218

Even Fall	Odd Spring
MA218 Quantitative Methods for Business	MA216 Computer Mathematics
	MA218-HP Quantitative Methods for Business (honors)

Odd Fall	Even Spring
MA218 Quantitative Methods for Business	MA214 Math of Finance
	MA216 Computer Mathematics

Mathematics For Middle School Courses

Even Fall	Odd Spring
MA302 Elementary Math Functions for Middle School	MA306 Geometry for Middle School

Odd Fall	Even Spring
MA304 Statistics, Probability, and Discrete Math for Middle School	

Comprehensive Rotation

Please note that this information is provided for pre-planning purposes only. All offerings noted here are tentative. Unforeseen circumstances could impact the offering of a particular course; however, the department will make every effort to assure the least negative impact on students should a change in a rotation be required.

Even Fall	Odd Spring
MA212 Elementary Statistics MA218 Quantitative Methods for Business MA250 Transitions to Advanced Math MA273 Multivariable Calculus I MA302 Elem Math Functions for Mid School MA400 History of Mathematics	MA212 Elementary Statistics MA216 Computer Mathematics MA218 Quant Methods for Business (HP) MA222 Intermediate Statistics MA247 Linear Algebra MA274 Multivariable Calculus II MA306 Geometry for Middle School MA337 Statistical Computing With R MA441 Modern Algebra

Odd Fall	Even Spring
MA212 Elementary Statistics MA218 Quantitative Methods for Business MA250 Transitions to Advanced Math MA273 Multivariable Calculus I MA304 Stats, Prob, and Discrete Math for MS MA377/379 Ordinary Differential Equations	MA212 Elementary Statistics MA214 Math of Finance MA216 Computer Mathematics MA222 Intermediate Statistics MA247 Linear Algebra MA248 Mathematics Technology Lab MA337 Statistical Computing With R MA350 College Geometry

Electives List

MA212-315

MA212 Elementary Statistics
MA214 Mathematics of Finance
MA216 Computer Mathematics
MA218 Quantitative Methods for Business
MA222 Intermediate Statistics
MA295 Credited Internships
MA302 Elementary Math Functions for Middle School
MA304 Statistics, Probability and Discrete Math for Middle School
MA306 Geometry for Middle School

MA316+

MA316 Intermediate Discrete Mathematics
MA335 Probability Theory
MA336 Mathematical Statistics
MA337 Statistical Computing With R
MA338 Regression Analysis
MA347 Topics in Linear Algebra
MA350 College Geometry
MA375 Advanced Calculus
MA377 Ordinary Differential Equations
MA379 Differential Equations for Engineers
MA382 Mathematical Modeling
MA385 Topics in Applied Mathematics
MA387 Topics in Mathematics
MA389 Topics in Statistics
MA399 Independent Study
MA400 History of Mathematics
MA417 Introduction to Topology
MA441 Modern Algebra
MA442 Topics in Modern Algebra
MA467 Functions of a Complex Variable
MA481 Numerical Analysis