MATHEMATICS (B.S.)

Alfred North Whitehead described mathematics as the most original creation of the human mind. For more than 5,000 years this creation has grown and evolved; today, it permeates virtually every intellectual discipline. Mathematicians make use of an approach called the axiomatic method whereby propositions or theorems are deduced from a set of axioms using the principles of Aristotelian logic. This axiomatic method is used in the development of mathematical systems and designed to develop the student's ability to think and reason abstractly. Mathematics also provides the key to understanding the sciences. Carl Friedrich Gauss called mathematics the "queen of the sciences" and indeed, it forms an integral part of scientific thought and is a necessary component of contemporary advances in all scientific fields. In addition, mathematics finds wide application in such diverse fields as economics, business, social studies, art, and education.

Although it is far beyond the capability of any one individual to master the whole of mathematics, the program at the University of St. Francis is designed to give the student a full exposure to topics in undergraduate mathematics. Courses in the curriculum can prepare a student for graduate study, for a career in business or industry, or for any of several professions, including teaching.

The mathematics major also provides for a concentration in actuarial science that can lead to a career as an actuary within the insurance field or as a private consultant. The student selecting this program should plan to complete the first two actuarial examinations prior to graduation.

Mathematics majors who are interested in obtaining a professional educator license in secondary mathematics must also meet the secondary education requirements as listed in the Teacher Education section of this catalog. Students may also earn their Middle Grades Mathematics Endorsement as part of this program. This program is also available as a Combined 4+1 program. A Bachelor of Science in Mathematics is earned along with a Master of Education degree after completing the required courses and program requirements.

All mathematics majors are required to complete a Major Portfolio. Broadly, the portfolio consists of samples of a student's mathematical work; evidence of participation in activities of the mathematical community, both within and outside of the university; and reflection of mathematical growth. Portfolio creation generally commences with successful completion of MATH 182 Calculus/Analytic Geometry II and culminates as a graded element of MATH 490 Senior Seminar.

Major Program (51-75 credit hours)

Code	Title	Hours
Required Core Courses		
MATH 175	Statistics	4
MATH 181	Calculus/Analytic Geometry I	5
MATH 182	Calculus/Analytic Geometry II	4
MATH 271	Calculus III	4
MATH 275	Linear Algebra	3
MATH 280	Differential Equations	3
MATH 326	Discrete Mathematics	3
MATH 331	Mathematical Statistics I	3
MATH 391	Junior Seminar	1
MATH 490	Senior Seminar	2

Select one of the following concentrations:		19-43
Actuarial Science Concentration (p. 1)		
Data Science Concentration (p. 1)		
Mathematical Sciences Concentration (p. 1)		
Total Hours		**51-75**

Mathematical Sciences Concentration (19 credit hours)

Code	Title	Hours
COMP 140	Computer Science I	4
MATH 351	College Geometry	3
MATH 371	Introduction to Analysis	3
MATH 375	Abstract Algebra I	3
Mathematics Electives		
Select two of the following:		6
MATH 310	Theory of Interest (3)	
MATH 320	History of Mathematics I (3)	
MATH 321	History of Mathematics II (3)	
MATH 330	Introduction to Data Science (3)	
MATH 332	Mathematical Statistics II (3)	
MATH 365	Operations Research (3)	
MATH 370	Applied Regression Analysis (3)	
MATH 380	Numerical Analysis (3)	
MATH 494	Topics in Mathematics (1-3)	
Total Hours		**19**

Actuarial Science Concentration (43 credit hours)

Code	Title	Hours
Actuarial Science Core		
MATH 310	Theory of Interest	3
MATH 332	Mathematical Statistics II	3
MATH 365	Operations Research	3
MATH 370	Applied Regression Analysis	3
MATH 380	Numerical Analysis	3
Required Actuarial Science Support Courses		
ACCT 125	Financial Accounting	3
ACCT 126	Managerial Accounting	3
COMP 140	Computer Science I	4
ECON 101	Principles of Macroeconomics	3
ECON 102	Principles of Microeconomics	3
FINC 242	Principles of Finance	3
FINC 340	Insurance and Risk Management	3
FINC 345	Investments	3
FINC 430	Advanced Corporate Finance	3
Total Hours		**43**

Data Science Concentration (28 credit hours)

Code	Title	Hours
MATH 330	Introduction to Data Science	3
MATH 332	Mathematical Statistics II	3
MATH 370	Applied Regression Analysis	3
COMP 140	Computer Science I	4
COMP 150	Computer Science II	3

COMP 400	Database Management	3
COMP 440	Artificial Intelligence	3
Select one of the following:		3
MATH 365	Operations Research (3)	
MATH 380	Numerical Analysis (3)	
Select one of the following:		3
PHIL 320	Contemporary Issues In Ethics (3)	
PHIL 330	Just Business (3)	
Total Hours		**28**

The Senior Capstone Project / Paper must be an approved Data Science topic.

Students work with their advisors in selecting additional elective credits to fulfill the 120 credit hours required for graduation.