

MATHEMATICS (MATH)
MAJOR REQUIREMENTS & SUGGESTED COURSE SEQUENCE

SUGGESTED COURSE SEQUENCE

XXX	College Core Requirement	3	
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FIRST YEAR - DECLARE MAJOR

Fall Semester			
Course #	Course name	Cr	YR
MATH 151	Calculus I for Science	4	
CS 160	Discrete Logic	4	
ENGL 101	Writing and Rhetoric	3	
CORE 1XX	College Core Requirement	3	
SSP 101	Student Success Program	1	
Credit Total 15			

Spring Semester			
Course #	Course name	Cr	YR
CS 150	CS I – Python/MatLab	4	
MATH 152	Calculus II for Science	4	
COLL 110	College Seminar	3	
CORE XXX	College Core Requirement	3	
PHIL 101	Intro to Philosophy	3	
Credit Total 17			

SECOND YEAR - DECLARE MAJOR (if needed)

Fall Semester			
Course #	Course name	Cr	YR
MATH 251	Calculus III	4	
PHYS 151	Physics I for Science	4	
PHIL 303	Logic	3	
XXX	Open Elective	3	
CORE XXX	College Core Requirement	3	
Credit Total 17			

Spring Semester			
Course #	Course name	Cr	YR
MATH 252	Linear Algebra & Diff Equations	4	
MATH 210	Intro to Statistics & Probability	3	
PHYS 152	Physics II for Science	4	
XXX	Open Elective	3	
CORE XXX	College Core Requirement	3	
Credit Total 17			

THIRD YEAR

Fall Semester			
Course #	Course name	Cr	YR
MATH 320	Intro to Algebraic Structures	4	
CHEM 151	Principles of Chemistry I	4	
MATH XXX	Math Elective	4	
CORE XXX	College Core Requirement	3	
Credit Total 15			

Spring Semester			
Course #	Course name	Cr	YR
MATH 340	Intro to Real Analysis	4	
MATH 300	Mathematical Discovery	3	
MATH XXX	Math Elective	4	
CORE XXX	College Core Requirement	3	
Credit Total 14			

FOURTH YEAR

Fall Semester			
Course #	Course name	Cr	YR
MATH 350	Graph Theory	4	
MATH XXX	Math Elective	4	
CORE XXX	College Core Requirement	3	
CORE XXX	College Core Requirement	3	
XXX	Open Elective	0-4	
Credit Total 14-18			

Spring Semester			
Course #	Course name	Cr	YR
MATH XXX	Math Elective	4	
MATH 499	Senior Research Seminar Math	3	
CORE XXX	College Core Requirement	3	
CORE XXX	College Core Requirement	3	
IDST 499	College Capstone	1	
XXX	Open Elective	0-6	
Credit Total 14-18			

GRADUATION REQUIREMENTS	TOTAL CREDITS
Mathematics Major	42
Open Electives	29
Holy Cross College Core Curriculum	49
MINIMUM CREDITS REQUIRED FOR GRADUATION	120
Mathematics Program Advisor: Prof. Deborah Arangno, Vincent Hall 178, 574-239-8381, darangno@hcc-nd.edu	

MAJOR REQUIREMENTS**MATHEMATICS (MATH)**

The following worksheet lists courses needed to fulfill requirements to graduate with a *Mathematics* major.

Prerequisite courses must be met with a grade C or higher. In addition, students must complete the Holy Cross College Core Curriculum Requirements for graduation.

Course	Credits	Semesters Offered
<i>Mathematics Major Courses</i>		
MATH 151 Calculus I for Science Prerequisite: MATH 125 or equivalent	4	Fall/Spring
MATH 152 Calculus II for Science Prerequisite: MATH 151 or equivalent	4	Fall/Spring
MATH 251 Calculus III Prerequisite: MATH 152 or equivalent	4	Fall/Spring
MATH 252 Linear Algebra & Differential Equations Prerequisite: MATH 152 or equivalent OR MATH 255 Differential Equations AND MATH 275 Linear Algebra	4-8	Spring
MATH 320 Intro to Algebraic Structures Prerequisite: MATH 152 or equivalent, and Logic (MATH 305, CS106, or PHIL 303)	4	
MATH 340 Intro to Real Analysis Prerequisite: MATH 251 and Logic (MATH 305, CS106, or PHIL 303)	4	
MATH 499 Senior Research Seminar in Math	3	
MATH 305 Mathematical Methods, or CS 160 Discrete Logic, or PHIL 303 Logic Prerequisite: MATH 111 (or higher)	3-4	Fall/Spring

Mathematics Elective Courses Choose elective courses from the list below that totals 15 credit hours <u>or</u> choose from specific tracks below.		
MATH 210 Statistics	3	
MATH 220 Cryptography	3	
MATH 300 Mathematical Discovery Prerequisite: MATH 151 or equivalent	4	
MATH 310 Probability Theory	4	
MATH 350 Graph Theory Prerequisite: Linear Algebra (MATH 252 or MATH 275), and Logic (MATH 305, CS106, or PHIL 303)	4	
MATH 360 College Geometry Prerequisite: MATH 251 and Logic (MATH 305, CS106, or PHIL 303)	4	
MATH 380 Complex Variables Prerequisite: MATH 340 or equivalent, and Logic	4	
MATH 400 Topics in Mathematics Prerequisite: MATH 340 or equivalent, and Logic	4	
MATH 410 Topology Prerequisite: MATH 340 or equivalent, and Logic	4	
MATH 420 Modern Algebra Prerequisite: MATH 320 or equivalent, and Logic	4	
MATH 440 Real Analysis I Prerequisite: MATH 340 or equivalent, and Logic	4	
MATH 450 Real Analysis II Prerequisite: MATH 450 or equivalent	4	
CS 150 Computer Science I (Python/Matlab) Prerequisite: CS 160 with a C or higher	4	Fall/Spring
CHEM 151 Principles of Chemistry I for Science	4	Fall/Spring
PHYS 151 Physics I for Science	4	Fall/Spring
PHYS 152 Physics II for Science	4	Fall/Spring
Applied Math/Data Analytics Track – 15 credit hours		
CS 150 Computer Science I – Python/ MatLab	4	Fall/Spring
CS 217 Intro to Data Analytics	3	Spring
MATH 3XX (Advanced Statistics/Introduction to R, or Probability Theory, etc)	3 – 4	Spring
CS 280 Data Structures	3	Spring
Computer Science: AI Track – 13 credit hours		
CS 150 Computer Science I – Python/ MatLab	4	Fall/Spring
CS 217 Intro to Data Analytics	3	Spring
CS 227 AI/Machine Learning Principles	3	Spring
CS 327 Computer Vision Prerequisite: CS 227	3	Fall
Computer Science: Traditional Track – 14 credit hours		
CS 150 Computer Science I – Python/ MatLab	4	Fall/Spring
CS 250 Computer Science II – Python/ C++	4	Fall/Spring
CS 217 Introduction to Data Analytics Prerequisite: Successful proficiency in (CS 107, CS150, CS160, or by passing a standardized exam), and MATH111 (or higher) with a C- or higher	3	Fall
CS 3XX – 4XX (Algorithms, Automata, etc)	3	Spring
Physical Science Track – 16 credit hours		
PHYS 151 General Physics I	4	Fall/Spring
PHYS 152 General Physics II	4	Fall/Spring

CHEM 151 Principles of Chemistry I	4	Fall/Spring
STEM elective: CS 150 Computer Science I, MATH 220 Cryptography, CHEM211 Organic Chemistry, etc...	4	Fall/Spring