MATHEMATICS - THEORETICAL EMPHASIS (MTH 110 FULFILLED)

BACHELOR OF ARTS OR BACHELOR OF SCIENCE DEGREE

THIS IS A **GENERAL** CURRICULUM GUIDE AND IS NOT APPLICABLE TO EVERY STUDENT. IT IS IMPORTANT TO MEET WITH YOUR ADVISOR.

Year One

[1]MTH 124 Precalculus: Functions and Models [GE Math]
   Prerequisite: MTH 110 or proficiency through math placement
   SEE NOTE BELOW REGARDING OPTIONS FOR THIS COURSE
	5	[1]MTH 201 Calculus I
		   Prerequisites: MTH 122 and MTH 123, or MTH 124, or proficiency through math placement
			4

Gen Ed [GE Art] or [2]WRT 120 (self-placement)	3	[4]MTH 204 Linear Algebra I Prerequisites: MTH 122 and MTH 123, or MTH 124, or proficiency through math placement	3
Gen Ed [GE Social/Behavioral]	3	[2]WRT 130 or 150 [GE Writing]	3/4
Gen Ed [GE Physical/Life Science without Lab]	3	Gen Ed [GE Philosophy and Literature]	3
[3]Elective	1	[3]Elective	1
		[3]Elective (if necessary)	1
Total	15	*Total*	15-16*

Year Two

MTH 202 Calculus II
   Prerequisite: MTH 201
	4	MTH 203 Calculus III
		   Prerequisite: MTH 202
			4

[5] MTH 210 SWS Communicating in Mathematics
   Prerequisites: Gen Ed Foundations – Writing and MTH 201
	4	MTH 205 Linear Algebra II
		   Prerequisites: MTH 204 or 302
			3

Gen Ed [GE Social/Behavioral]	3	CIS 161 Computational Science (recommended) ***OR*** CIS 162 Computer Science I	3/4
Gen Ed [GE Physical/Life Science with Lab]	4	Gen Ed [GE Historical Analysis]	3
		[3]Elective	1
		[3]Elective (if necessary)	1
Total	15	*Total*	15-16*

Year Three

STA 312 Probability and Statistics
   Prerequisites: MTH 201
	3	MTH 350 Modern Algebra
		   Prerequisites: MTH 210 and either MTH 204 or 225
			3

[6] MTH Elective	3	[6] MTH Elective	3
Gen Ed [GE Global Perspectives]	3	[7]MTH Cognate	3/4
[3]Elective	3	Gen Ed [GE US Diversity]	3
[3]Elective	3	[3]Elective	3
Total	15	*Total*	15-16*

Year Four

MTH 408 Real Analysis 1
Prerequisites: (MTH 203 and one of the following: MTH 315, MTH 331, MTH 350, or MTH 431), or (MTH 210 and permission of instructor).
	3	MTH 495: The Nature of Modern Mathematics
		   Prerequisites: MTH 210, MTH 204, MTH 350, and at least one other 300-400 level mathematics courses
		OR MTH 496 Senior Thesis
		   (Capstone) Prerequisites: 27 credits in major, major GPA of 3.0 or better, and permission of instructor
			3

[6] MTH Elective 400 level	3	Issue	3
Issue	3	[3]Elective	3
[3]Elective	3	[3]Elective	3
[3]Elective	3	[3]Elective	3
Total	15	*Total*	15

* The block tuition rate is 12-15 credits. You will pay additional tuition for any credits over 15.

MTH 124 is designed for calculus-bound students as a replacement for MTH 122 & 123. While students can still fulfill the MTH 201 prerequisite by taking MTH 122 & 123, MTH 124 is strongly recommended for students who plan to major in mathematics.

[1] **Students must fulfill MTH 110, MTH 122, and MTH 123, or MTH 124 or waive the requirement through math placement. These courses do not count towards the completion of the Mathematics major.**

[2] Students who self-place into WRT 120 should take this course in the fall semester and then take WRT 130 in the winter semester of their first year. Students who self-place into WRT 150 can take in either semester during their first year. Students will not need to take WRT 150 if they have earned credit for the course through AP/Dual Enrollment. A grade of C or better is required in WRT 130 or 150 in order to satisfy the WRT requirement at GVSU.

[3] Elective refers to any course to help you earn the required 120 credits to graduate.

[4] Students must complete a total of two courses with an SWS attribute

[5] Mathematics students must complete a total of 12 courses in Math. These electives are listed on the back.

[6]Mathematics students must complete three Math Cognate Courses. These courses are listed below.

Degree Requirements

Mathematics students can pursue a Bachelor of Arts or Bachelor of Science degree. Students who wish to obtain a BA must fulfill 3rd semester proficiency in a foreign language (201 level). The BS requirements are incorporated into the major requirements and include MTH 201, MTH 202, and STA 312.

To earn a degree from GVSU, all students must complete the following: 120 total credits, all major/minor requirements, all general education requirements, at least 58 credits from a 4-year institution, and the last 30 credits of the degree completed through GVSU.

Declaring the Mathematics – Theoretical Major:

1. Log into myBanner from the GVSU homepage
2. Once logged in, select "Student," "Student Records," and then "Change Major"
3. Click on the "Change Major 1/Program" box
4. Click on the down arrow in the box next to "New Major 1/Program"
5. From here scroll down and find "Mathematics - Theoretical." There are two options BA or BS. Click on the option you prefer.
6. Click "Submit" and then click "Change to New Program"

General Education Categories fulfilled by the Mathematics Major:
Mathematical Sciences: MTH 201
Option of Choosing HSC 201 as Historical Analysis gen ed

Additional Courses
Choose from the following list for a total of 12 courses in mathematics – electives must be at the 300 level or higher At least one math elective MUST be at the 400 level

MTH 300 Vector Analysis	MTH 406 Linear Algebra III
MTH 304 Analysis of Differential Equations	MTH 409 Real Analysis II
MTH 305 Mathematical Modeling	MTH 431 Non-Euclidean Geometry
MTH 315 Discrete Mathematics	MTH 441 Topology
MTH 360 Operations Research	MTH 450 Modern Algebra II
MTH 401 Mathematics for the Physical Sciences	MTH 465 Automata and Theory of Computation
MTH 402 Complex Variables	MTH 495 Nature of Modern Math (if MTH 496 is taken as capstone)
MTH 405 Numerical Analysis	MTH 496 Senior Thesis (if MTH 495 is taken as capstone)
	MTH 498 Project-Based Applied Mathematics
With unit head permission: MTH 380, 399, 480, and 499	

Courses not applicable as Math electives are: MTH 302, 312, 322, 323, 324, 325, 329, 331, and 490

Math Cognate Courses		
Required	**Pick ONE of the following**	
CIS 161 Computational Science (Recommended) **Or** CIS 162 Computer Science I **And** STA 312 Probability and Statistics	BIO 355 Human Genetics BIO 375 Genetics CHM 351 Introduction to Physical Chemistry CMB 451 Bioinformatics CMB 452 Computational Biology ECO 400 Econometrics and Forecasting GEO 470 Geophysics	HSC 201 The Scientific Revolution PHI 203 Intermediate Logic PHY 230 Principles of Physics I PSY 300 Research Methods in Psychology STA 314 Statistical Quality Methods STA 412 Mathematical Statistics I