Bachelor of Science – Mathematics Requirements (MATH BS)

65-73 credits (min. 32 upper level credits)

Mathematics Core Requirements (29 credits)	Pre-requisites	Credits	Semesters Offered*	Semester Taken and Grade
MATH 151 – Calculus and Analytic Geometry I	MATH 150 or Milestone 5 on Math Placement	4	FSZ	
MATH 152 – Calculus and Analytic Geometry II	MATH 151 or MATH155B	4	FSZ	
MATH 221 - Introduction to Linear Algebra	MATH 151 or MATH 155B	3	FSZ	
MATH 225 - Introduction to Differential Equations	MATH 152 (MATH 251 is Recommended Preparation)	3	FWSZ	
MATH 251 - Multivariable Calculus	MATH 152	4	FSZ	
MATH 300 - Introduction to Mathematical Reasoning	MATH 221	4	FSZ	
MATH 301 - Introduction to Mathematical Analysis I	MATH 300 and MATH 152	4	FSZ	
MATH 302 - Introduction to Mathematical Analysis II OR MATH 401 - Mathematical Analysis	MATH 251 and MATH 301 MATH 301	3 3	FS varies	
Mathematics/Statistics Electives (18-24 credits) – See page 2 for guidance				
	See catalog	3-4		
	See catalog	3-4		
	See catalog	3-4		
	See catalog	3-4		
	See catalog	3-4		
	See catalog	3-4		
Physics and Computer Science Requirements (12 credits)				
CMSC 201 - Computer Science I	MATH 150/151/155 or Milestone 5 on Math Placement	4	FS	
PHYS 121 - Introductory Physics I	MATH 151 (pre-/co-req)	4	FSZ	
PHYS 122 - Introductory Physics II	PHYS 121/121H, MATH 152 (pre-/co-req)	4	FSZ	
Supplementary Requirements (6-8 credits) – See page 2 for guidance				
	See catalog	3-4		
	See catalog	3-4		

Minimum grade of "C" is required in all courses applied to the major and all courses used as prerequisites for major requirements.

*The “Semesters Offered” column indicates the semester in which that course is typically offered, subject to change by the department that administers the course. Please consult the UMBC Schedule of Classes for current offerings. Key: F = Fall, S = Spring, Z = Summer, W = Winter.

Bachelor of Science – Mathematics Requirements (MATH BS)

Mathematics/Statistics Electives

Complete a minimum of 18 credits from courses in mathematics or statistics numbered 300 or higher, excluding MATH 432, STAT 350, and STAT 351, **including a minimum of 9 credits at the 400 level**,

For ONE of the MATH/STAT electives, a major may bundle together three or more credits from courses carrying one or two credits, from the following or other approved courses:

MATH 426 - Introduction to Math Software Packages: MATLAB (2)
MATH 427 - Mathematical Software Packages: Maple (1)
MATH 479 - Mathematical Problem-Solving Seminar (1)
MATH 480 - Senior Seminar (1)
MATH 490 - Special Topics in Mathematics (1-4)
MATH 496 - Mathematics Practicum (1-4)
MATH 499 - Independent Study in Mathematics (1-4)
STAT 432 - Statistical Computer Packages and Their Applications: SAS and R (1)
STAT 470 - Probability for Actuarial Science (1)
STAT 490 - Special Topics in Statistics (1-4)
STAT 496 - Statistics Practicum (1-4)
STAT 499 - Independent Study in Statistics (1-4)

Information regarding specialties in specific fields of mathematics is available on the department website.

Supplementary Electives

Mathematics and statistics have proven indispensable in many disciplines in the physical sciences, the social sciences and even in the humanities and arts. Much of mathematics and statistics has developed with a view toward its applications in other fields. To develop an appreciation of the connection, mathematics majors are required to additional courses from other departments reflecting these interconnections. The list below is taken from the 2025-2026 Undergraduate Catalog – please see the current catalog for an up-to-date list of approved courses.

BIOL 463 - Theoretical and Quantitative Biology (4)
CHEM 401 - Chemical and Statistical Thermodynamics (3)
CHEM 415 - Statistical Mechanics and Theory of Rate Processes (3)
CMPE 320 - Probability, Statistics, and Random Processes (3)
CMPE 323 - Signal and Systems Theory (4)
CMSC 341 - Data Structures (3)
CMSC 441 - Design and Analysis of Algorithms (3)
CMSC 442 - Information and Coding Theory (3)
CMSC 443 - Cryptology (3)
CMSC 451 - Automata Theory and Formal Languages (3)
CMSC 452 - Logic for Computer Science (3)
CMSC 453 - Applied Combinatorics and Graph Theory (3)
ECON 311 - Intermediate Microeconomic Analysis (3
ECON 374 - Financial Management (3)
ECON 417 - The Economics of Strategic Interaction (3)
ECON 421 - Introduction to Econometrics (3)
EDUC 426 - Methods of Teaching Mathematics in the Secondary School (3)
ENCH 300 - Chemical Process Thermodynamics (3)
ENME 217 - Engineering Thermodynamics (3)
ENME 410 - Operations Research I (3)
MATH 432 - History of Mathematics (3)
PHIL 248 - Introduction to Scientific Reasoning (3)
PHIL 346 - Deductive Logic (3)
PHIL 372 - Philosophy of Science (3)
PHYS 224 - Vibrations and Waves / PHYS 211 - Introductory Physics III: Waves and Relativity (3)
PHYS 303 - Thermal and Statistical Physics / PHYS 311 - Statistical Mechanics (3)
PHYS 321 - Intermediate Mechanics / PHYS 411 - Classical Mechanics (3)
PHYS 407 - Electromagnetic Theory / PHYS 412 - Electromagnetism (3)
PHYS 424 - Introduction to Quantum Mechanics / PHYS 312 - Quantum Mechanics I (3)
PHYS 440 - Computational Physics (3)

Courses on this list may have prerequisite requirements that are not included in the MATH BS major. Please consult the UMBC Undergraduate Catalog for more information on the required preparation for your preferred courses. Not all courses in this list are offered on a regular basis. Always consult the UMBC schedule of classes for course offerings and plan accordingly.

Mathematics majors with a major or minor in Statistics must have two **elective** courses of three (or more) credits for each program, neither of which is being counted simultaneously for both programs.