Bachelor of Science – Physics Requirements (PHYS)

74 credits (30 upper-level credits)

Physics (40 credits)	Pre-requisites	Credits	Semesters Offered	Semester Taken	Grade
PHYS 121 - Introductory Physics I: Mechanics *	MATH 151 (pre/co-req)	4	FSZ		
PHYS 122 - Introductory Physics II: Electricity and Magnetism *	MATH 152 (pre/co-req) and PHYS 121/121H	4	FSZ		
PHYS 133L - Experimental Physics I for Physicists *	PHYS 122/122H (pre/co-req)	3	FSZ		
PHYS 190 - Becoming a Physicist		1	F		
PHYS 211 - Introductory Physics III: Waves and Relativity *	PHYS 122/122H	3	FS		
PHYS 212 - Introductory Physics IV: Thermal and Quantum Physics *	PHYS 211 (or 224)	3	FS		
PHYS 233L - Computational Physics I *	MATH 152, PHYS 122, CMSC 201	4	FS		
PHYS 311 - Statistical Mechanics	MATH 251, PHYS 212 (or 324)	3	F		
PHYS 312 - Quantum Mechanics I	MATH 221, MATH 225, MATH 251, PHYS 212 (or PHYS 324)	3	F (to F 28) S (start S 29		
PHYS 333L - Experimental Physics II (WI)*	ENGL 100, PHYS 133L (or 122L), PHYS 211 (or PHYS 224), PHYS 233L	3	FS		
PHYS 411 - Classical Mechanics	MATH 221, MATH 225, MATH 251, PHYS 211 (or PHYS 224)	3	S (to S 28) F (start F 29)		
PHYS 412 - Electromagnetism	MATH 221, MATH 225, MATH 251, PHYS 211 (or PHYS 224)	3	S		
PHYS 433L - Experimental Physics III	PHYS 333L (or PHYS 330L), PHYS 212 (or PHYS 324)	3	FS		
Physics Upper-Level Electives (12 credits)					
PHYS 3xx/4xx _____		3			
PHYS 3xx/4xx _____		3			
PHYS 3xx/4xx _____		3			
PHYS 3xx/4xx _____		3			
Mathematics (18 credits)					
MATH 151 – Calculus and Analytical Geometry I *	MATH 150	4	FSZ		
MATH 152 – Calculus and Analytical Geometry II *	MATH 151	4	FSZ		
MATH 221 – Introduction to Linear Algebra *	MATH 151	3	FSZ		
MATH 225 – Introduction to Differential Equations *	MATH 152	3	FSZ		
MATH 251 – Multivariable Calculus *	MATH 152	4	FSZ		
Computer Science (4 credits)					
CMSC 201 *	MATH 150	4	FS		

* Minimum grade of "C" required in PHYS and other courses that serve as prerequisites to required courses.

The cumulative GPA of Physics courses at the 300 and 400 level required for the Physics major must be at least 2.0.

F = Fall, S = Spring, Z = Summer. Courses marked with a “Z” have traditionally been taught in the summer, however, there is no guarantee that they will be offered every summer.

Bachelor of Science – Physics Requirements (PHYS)

Electives List (from the 2026-27 Undergraduate Catalog):

PHYS 304 Fundamentals of Astrophysics (3)
PHYS 315 Galaxies and the Interstellar Medium (3)
PHYS 351 Physics and Chemistry of the Atmosphere (3)
PHYS 361 Introduction to Quantum Computing (3)
PHYS 402 Nuclear Physics (3)
PHYS 405 Stellar Astrophysics (3)
PHYS 406 Extragalactic Astrophysics (3)
PHYS 408 Optics (3)
PHYS 415 Astroparticle Physics (3)
PHYS 416 Cosmology (3)
PHYS 418 Semiconductor Optical Devices (3)
PHYS 425 Relativistic Physics (3)
PHYS 434 Advanced Quantum Mechanics (3)
PHYS 435 Computational Physics II (3)
PHYS 450 Special Topics (1-4)
PHYS 451 Atmospheric Physics I (3)
PHYS 452 Atmospheric Physics II (3)
PHYS 453 Introduction to Atmospheric Radiation (3)
PHYS 461 Quantum Information Physics (3)
PHYS 471 Solid State Physics I (3)
PHYS 472 Solid State Physics II (3)
PHYS 473 Computational and AI Methods in Materials Science (3)
PHYS 480 Techniques in Theoretical Physics (3)
PHYS 490 Senior Seminar (1)
PHYS 499 Senior Research (3)
PHYS 499H Senior Research (3)

Complete 12 credits from the above list. No more than 3 credits of PHYS 499 or PHYS 499H may apply.

Students in the BS Physics program will have the option to elect a track within a given research area. The required Physics Upper-Level Elective courses for each of the tracks can be found below.

Quantum Information	**Materials Physics**	**Astrophysics**	**Atmospheric Physics**
PHYS 361	PHYS 434	PHYS 415	PHYS 351
PHYS 434	PHYS 471	PHYS 416	Two of the following:
PHYS 461	PHYS 472 or PHYS 473	PHYS 425	PHYS 435, 451, 452, 453
		STAT 355 or MATH 404	

NOTE: 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.