

Physics Degree Requirements (B.S.)

The B.S. curriculum in physics requires a minimum of 120 credits, including [53 credits in physics and physics-related courses](#), as detailed in the course lists.

To determine the biology course to fulfill the General Education natural science requirement, students should consult with their adviser. CHEM 101/102, L101/102 General Chemistry and Laboratories are highly recommended for all physics majors.

Along with the General Education requirements of the College of Humanities and Sciences and the undergraduate requirements, students must take required courses and fulfill specific requirements for the degree as follows:

Required Physics Courses	Credits
PHYS 207 University Physics I	5
PHYS 208 University Physics II	5
PHYS 301 Classical Mechanics I	3
PHYS 320 Modern Physics	3
PHYZ 320L Modern Physics Lab	1
PHYS 340 Statistical Mechanics & Thermodynamics	3
PHYS 376 Electromagnetism	3
PHYS 380 Quantum Physics I	3
PHYS 450* Senior Physics Lab	3
PHYS 490 Seminar in Conceptual Physics	1
*writing-intensive	30
Required Mathematical Courses	
MATH 200 Calculus I	4
MATH 201 Calculus II	4
MATH 301 Differential Equations	3
MATH 307 Multivariate Calculus	3
	14

Elective Physics & Physics-Related Courses (9 CR)

A total of nine credits must be taken from the list of elective physics and physics-related courses provided below. Those students who have their primary major in physics are required to fulfill at least three of these credits using upper-level physics courses.

List of Elective Courses:

Any upper-level [Physics](#) course not listed as a required course, e.g. PHYS 302 Mechanics II, PHYS 397 Directed Study, PHYS 420 Quantum II, PHYS 440 Solid State, PHYS 491 Topics in Physics, and PHYS 492 Independent Study

Any of the following [Math or Statistics](#) courses:
 MATH 310 Linear Algebra, MATH 437 Partial Differential Equations, MATH 511 Applied Linear Algebra, MATH 512 Complex Analysis, MATH 515/516 Numerical Analysis I-II, MATH 517/518 Methods of Applied Math, STAT 541 Applied Statistics

Any of the following [Chemistry](#) courses:

CHEM 409 Instrumental Analysis and CHEM 510 Atomic and Molecular Structure

Any of the following [Engineering](#) courses:

ENGR 301 Fluid Mechanics, EGRB 303 Biotransport, EGRB 427 Biomaterials, EGRC 301 Fluid Dynamics, ENGR 412 Advanced Mathematics, EGRE 224 Microelectronics, EGRE 303 Electronic Devices, EGRE 307 Integrated Circuits, EGRM 436 Engineering Materials

Suggested Physics Course Sequence

Freshman year. PHYS 207 University Physics I (5), MATH 200/201 Calculus (8).

Sophomore Year. PHYS 208 University Physics II (5), PHYS 320-320L Modern Physics and Lab (4), MATH 301 Differential Equations (3), MATH 307 Multivariate Calculus (3).

Junior Year. PHYS 301 Mechanics I (3), PHYS 340 Statistical Mechanics (3), PHYS 380 Quantum I (3), Physics-related elective (3).

Senior Year. PHYS 376 Electromagnetism (3), PHYS 450 Senior Lab (3), PHYS 490 Physics Seminar (1), Physics-related electives (6).

Those students intending to pursue graduate studies in physics should take PHYS 302, 420, 440, 571, 576 and/or 580. Those interested in experimental physics should also take one or more credits in PHYS 397 or 492.

Double Major in Engineering & Physics

Students choosing a secondary major in physics must fulfill the requirements listed for the B.S. in physics. Double majors can also use a select number of Engineering courses as acceptable substitutes for required physics courses, as given in the table below. With regard to general education requirements, students must fulfill the requirements of their primary major.

Required Course	Acceptable Substitute	
PHYS 340	EGRM/C 204	Thermodynamics
PHYS 376	EGRE 309 or 310	Electromagnetism
PHYS 450+490	ENGR 402+403	Senior Design Studio

Minor in Physics

A minor in Physics requires the following coursework: PHYS 207, PHYS 208, PHYS 320, PHYS 320L and 6 credits of physics or physics-related courses which are acceptable for the major.

For further information, please contact [Dr. Ameen](#) (dameen@vcu.edu)