SCIENCE, BACHELOR OF SCIENCE (B.S.) WITH A CONCENTRATION IN PHYSICS

Student learning outcomes

Upon completing this program, students will know and know how to do the following:

Interdisciplinary science core learning outcomes

- Demonstrate competency in at least two sciences or in a non-science area
- Apply learning to selection and pursuit of professional or graduate career objective
- Demonstrate proficiency in communication of scientific or research findings
- Demonstrate ability to apply the scientific method/approach to professional problems
- Demonstrate appreciation of the interrelation of core sciences to interdisciplinary problems

Physics concentration-specific learning outcome:

- Demonstrate broad science proficiency, with special emphasis on the core discipline of physics.

Special requirements

The Bachelor of Science in Science requires a minimum of 120 credits.

Along with the general education requirements of the undergraduate programs and the College of Humanities and Sciences for a Bachelor of Science degree, this curriculum requires 27 credits in foundation science and mathematics courses and 34 credits in supplemental courses in the concentration. In preparation for the required mathematical sciences courses, all students must take the Mathematics Placement Test. Science majors are strongly encouraged to select a minor in an area different from their area of concentration that will complement their career interests and contribute additional upper-level credits to their curriculum

Grade requirements

A minimum grade of C is required in each prerequisite course:

Course	Title	Hours
CHEM 100	Introductory Chemistry (if required through placement test)	3
CHEM 101	General Chemistry I	3
CHEM 102	General Chemistry II	3
CHEM 301	Organic Chemistry	3
CHEM 302	Organic Chemistry	3

A minimum grade of C is required in the following courses before enrollment in advanced BIOL courses:

Course	Title	Hours
BIOL 151 & BIOZ 151	Introduction to Biological Sciences I and Introduction to Biological Science Laboratory I	4
BIOL 152 & BIOZ 152	Introduction to Biological Sciences II and Introduction to Biological Science Laboratory II	4
BIOL 300	Cellular and Molecular Biology	3

Degree requirements for Science, Bachelor of Science (B.S.) with a concentration in physics

Course	Title	Hours
General education (https://bulletin.vcu.edu/undergraduate/undergraduate-study/general-education-curriculum/)		
Select 30 credits of general education courses in consultation with an adviser.		30
Major requirements		
• Major core requirements		
INSC 490	Capstone Research Experience in Interdisciplinary Science	3
• Additional major requirements		
ENVS 301	Introduction to Meteorology (or upper-level science elective)	3
ENVS 310	Introduction to Oceanography (or upper-level science elective)	3
MATH 201	Calculus with Analytic Geometry II	4
MATH 301	Differential Equations	3
MATH 307	Multivariate Calculus	4
• Concentration requirements		
PHYS 208	University Physics II	5
PHYS 301	Classical Mechanics I	3
PHYS 320 & PHYZ 320	Modern Physics and Modern Physics Laboratory	4
PHYS 450	Senior Physics Laboratory	3
• Major electives		
Select an additional eight to nine credits from the following:		8-9
CHEM 102 & CHEZ 102	General Chemistry II and General Chemistry Laboratory II	
OPER 327	Mathematical Modeling	
PHYS 103 & PHYZ 103	Elementary Astronomy and Elementary Astronomy Laboratory	
PHYS/MHIS 307	The Physics of Sound and Music	
Or any course allowable for the B.S. in Physics, or a science elective approved by adviser		
Ancillary requirements		
Select one of the following:		4
BIOL 101 & BIOZ 101	Biological Concepts and Biological Concepts Laboratory	
BIOL 151 & BIOZ 151	Introduction to Biological Sciences I and Introduction to Biological Science Laboratory I	
BIOL 152 & BIOZ 152	Introduction to Biological Sciences II and Introduction to Biological Science Laboratory II	
HUMS 202	Choices in a Consumer Society	1

CHEM 101 & CHEZ 101	General Chemistry I and General Chemistry Laboratory I (CHEM 101 satisfies general education BOK for natural sciences and AOI for scientific and logical reasoning)	4
MATH 151	Precalculus Mathematics (or placement; satisfies general education quantitative foundations)	4
MATH 200	Calculus with Analytic Geometry I	4
PHYS 207	University Physics I (satisfies general education BOK for natural sciences and AOI for scientific and logical reasoning)	5
Experiential fine arts [1]		1-3
Foreign language through the 102 level (by course or placement)		0-6
Open electives		
Select any course.		27-36
Total Hours		**120**

[1] Course offered by the School of the Arts

The minimum number of credit hours required for this degree is 120.

What follows is a sample plan that meets the prescribed requirements within a four-year course of study at VCU. Please contact your adviser before beginning course work toward a degree.

Recommended course sequence/plan of study

Freshman year

Fall semester		**Hours**
CHEM 101 & CHEZ 101	General Chemistry I and General Chemistry Laboratory I (CHEM 101 satisfies general education BOK for natural sciences and AOI for scientific and logical reasoning)	4
MATH 151	Precalculus Mathematics (satisfies general education quantitative foundations)	4
UNIV 101	Introduction to the University	1
UNIV 111 Play course video for Introduction to Focused Inquiry: Investigation and Communicatio	Introduction to Focused Inquiry: Investigation and Communication (satisfies general education UNIV foundations)	3
General education course		3
	Term Hours:	**15**
Spring semester		
CHEM 102 & CHEZ 102	General Chemistry II and General Chemistry Laboratory II	4
HUMS 202	Choices in a Consumer Society	1
MATH 200	Calculus with Analytic Geometry I	4
PHYS 207	University Physics I (satisfies general education AOI for scientific and logical reasoning)	5
UNIV 112 Play course video for Focused Inquiry II	Focused Inquiry II (satisfies general education UNIV foundations)	3
	Term Hours:	**17**
Sophomore year		
Fall semester		
Select one of the following:		4
BIOL 101 & BIOZ 101	Biological Concepts and Biological Concepts Laboratory	-
BIOL 151 & BIOZ 151	Introduction to Biological Sciences I and Introduction to Biological Science Laboratory I	-
BIOL 152 & BIOZ 152	Introduction to Biological Sciences II and Introduction to Biological Science Laboratory II	-
MATH 201	Calculus with Analytic Geometry II	4
PHYS 208	University Physics II	5
UNIV 200	Advanced Focused Inquiry: Literacies, Research and Communication (satisfies general education UNIV foundations)	3
	Term Hours:	**16**
Spring semester		
MATH 301	Differential Equations	3
PHYS 320 & PHYZ 320	Modern Physics and Modern Physics Laboratory	4
General education course (select BOK to satisfy breadth of knowledge requirement and AOI for creativity, innovation and aesthetic inquiry)		3
General education course (select BOK to satisfy breadth of knowledge requirement and AOI for diversities in the human experience)		3-4
	Term Hours:	**13-14**
Junior year		
Fall semester		
PHYS 103 or OPER 327	Elementary Astronomy or Mathematical Modeling	3
PHYS 301	Classical Mechanics I	3
PHYS 307	The Physics of Sound and Music (fulfills experiential fine arts gen ed requirement)	3
Foreign language 101, upper-level open elective or minor elective		3
Open elective		3
	Term Hours:	**15**
Spring semester		
ENVS 301	Introduction to Meteorology (or upper-level science elective)	3
ENVS 310	Introduction to Oceanography (or upper-level science elective)	3
PHYS 450	Senior Physics Laboratory	3

Foreign language 102, upper-level open elective or minor elective		3
Upper-level open elective or minor elective		3
	Term Hours:	**15**
Senior year		
Fall semester		
BIOL 317 or ENVS 315 or PHYS 315 or BIOL 332 or ENVS 330	Ecology or Energy and the Environment or Energy and the Environment or Environmental Pollution or Environmental Pollution	3
ENVS 105 or URSP 204	Physical Geology or Physical Geography	3
URSZ 204	Physical Geography Laboratory	1
Experiential fine arts (if not fulfilled by PHYS/MHIS 307, upper-level recommended)		1-3
Open elective		3
Upper-level open elective or minor elective		3
	Term Hours:	**14-16**
Spring semester		
INSC 490	Capstone Research Experience in Interdisciplinary Science	3
Upper-level electives or minor electives		9
Upper-level science elective		3
	Term Hours:	**15**
	Total Hours:	**120-123**

The minimum number of credit hours required for this degree is 120.