

BIOLOGY (B.S.)

Requirements

Code	Title	Units
Core Curriculum Requirements (https://catalog.vanguard.edu/college/core-curriculum/)		47-44
Major Core Requirements		72-70
Total Units		119-114

Biology Major Core Requirements

Code	Title	Units
Biology Core Curriculum Major Requirements		
Lower Division Requirements		
BIOL-111 & 111L	Principles of Cell and Molecular Biology and Principles of Biology Lab, Principles of Cell/Molecular Biology Lab	4
BIOL-112 & 112L	Principles of Organismal Biology and Principles of Organismal Biology Lab	4
BIOL-220 & 220L	Cell Biology and Cell Biology Lab	4
CHEM-120 & 120L	General Chemistry I and General Chemistry I Lab	4
CHEM-121 & 121L	General Chemistry II and General Chemistry II Lab	4
MATH-180C	Calculus 1	4
PSCI-223C & 223CL	Mechanics of Solids and Fluids and Mechanics of Solids and Fluids Lab	4
or PSCI-130 & 130CL	Introduction to Physics I and General Physics I Lab	
PSCI-225 & 225L	Electricity and Magnetism and Electricity and Magnetism Lab	4
or PSCI-131 & 131L	General Physics II and General Physics II Lab	
Upper Division Requirements		
BIOL-309 & 309L	Microbiology and Microbiology Laboratory	4
BIOL-311 & 311L	Genetics and Genetics Laboratory	4
CHEM-304 & 304L	Organic Chemistry I and Organic Chemistry Techniques I	4
BIOL-485	Undergrad Biological Research	2
or BIOL-488	Biology Senior Project	
or BIOL-450	UG Research or Internship Program	
BIOL-499C	Capstone Seminar in Biology	2
Select one of the following Ecology Focus courses:		4
BIOL-315 & 315L	General Ecology and Ecology Field and Lab Practicum	
BIOL-345C	Mountain Field Biology	
BIOL-346C	Desert Field Ecology	
BIOL-348C	Coastal Ecology	
Electives ¹		

Select five lecture/lab courses from BIOL and CHEM		20-18
BIOL-302 & 302L	Comparative Vertebrate Anatomy and Comp Vertebrate Anatomy Lab	
BIOL-315 & 315L	General Ecology and Ecology Field and Lab Practicum	
BIOL-335	Biology of Cancer	
BIOL-365 & 365L	Neurobiology of Learning and Memory and Neurobiology of Learning/Memory Lab	
BIOL-345C	Mountain Field Biology	
BIOL-346C	Desert Field Ecology	
BIOL-348C	Coastal Ecology	
BIOL-403	Biotechnology	
BIOL-404 & 404L	Neuropharmacology and Neuropharmacology Laboratory	
BIOL-432 & 432L	Neuroscience and Neuroscience Lab	
BIOL-440 & 440L	Molecular Biology and Techniques in Molecular Biology	
BIOL-450	UG Research or Internship Program	
BIOL-451 & 451L	Immunology and Immunology Lab	
BIOL-455	Biology Teaching Internship	
BIOL-485	Undergrad Biological Research	
CHEM-305 & 305L	Organic Chemistry II and Organic Chemistry Technqs II	
CHEM-430 & 430L	Biochemistry and Experimental Tech/Biochemistry	
CHEM-435	Advanced Biochemistry	
Total Units		72-70

¹ In consultation with your academic advisor, select five lecture/lab combinations that best align with your career goals. Additional course selections in Environmental Sciences, Engineering Physics and Psychology maybe approved on a case-by-case basis.

Four Year Plan

Disclaimer: This sample Four Year Plan is provided as a guide for the recommended sequencing of courses. Vanguard University requires that students complete a minimum of 120 units of required course work as outlined on the Requirements tab in order to receive a Bachelor of Arts, Bachelor of Music, Bachelor of Science, or Bachelor of Science in Nursing degree. It is the student's responsibility to confirm with the department the course rotation before enrolling in courses. If applicable, please note the footnotes at the bottom of the page for additional information related to courses listed in a particular year and term. Questions, contact the Department of Biological Sciences.

Course	Title	Units
Year 1 Term 1		
BIOL-111	Principles of Cell and Molecular Biology	3
BIOL-111L	Principles of Biology Lab, Principles of Cell/Molecular Biology Lab	1
CHEM-120	General Chemistry I	3



CHEM-120L	General Chemistry I Lab	1
CORE-100C	Cornerstone	1
NT-101C	New Testament Survey	3
KINE-146C	Lifetime Fitness/Well Activity	1
CORE-100C	Cornerstone	1
BIOL-111	Principles of Cell and Molecular Biology	3
BIOL-111L	Principles of Biology Lab,Principles of Cell/ Molecular Biology Lab	1
CHEM-120	General Chemistry I	3
CHEM-120L	General Chemistry I Lab	1
KINE-145C	Lifetime Fitness/Wellness Lect	1
NT-101C	New Testament Survey	3

Units **26**

Year 1 Term 2

BIOL-112	Principles of Organismal Biology	3
BIOL-112L	Principles of Organismal Biology Lab	1
KINE-145C	Lifetime Fitness/Wellness Lect	1
SOC-PLCR	Social Science Core Curriculum Req'm't	3
MATH-PLSTAT	Math Sci Stat Or Into to Stat	3
BIOL-112	Principles of Organismal Biology	3
BIOL-112L	Principles of Organismal Biology Lab	1
CHEM-121	General Chemistry II	3
CHEM-121L	General Chemistry II Lab	1
KINE-146C	Lifetime Fitness/Well Activity	1
SOC-PLCR	Social Science Core Curriculum Req'm't	3
MATH-PLSTAT	Math Sci Stat Or Into to Stat	3

Units **26**

Year 2 Term 1

BIOL-220	Cell Biology	3
BIOL-220L	Cell Biology Lab	1
ENGL-120C	Persuasive Writing	3
COMM-201	Speech Composition and Presentation	3
THEO-101C	Foundations of Christian Life	3
BIOL-PLHD4	Biology Elective	4
BIOL-220	Cell Biology	3
BIOL-220L	Cell Biology Lab	1
ENGL-120C	Persuasive Writing	3
COMM-201C	Speech Composition and Presentation	3
THEO-PLHD	Theology Core Requirement	3
BIOL-PLHD4	Biology Elective	4

Units **34**

Year 2 Term 2

BIOL-309	Microbiology	3
BIOL-309L	Microbiology Laboratory	1
FINA-PLCR	Fine Arts Core Curriculum Requirement	3
OT-201C	Old Testament Survey	3
MATH-180C	Calculus 1	4
BIOL-PLHD4	Biology Elective	4
MATH-180C	Calculus 1	4

FINA-PLCR	Fine Arts Core Curriculum Requirement	3
OT-201C	Old Testament Survey	3

Units **28**

Year 3 Term 1

PSCI-130C	General Physics I	3
PSCI-130CL	General Physics I Lab	1
CHEM-304	Organic Chemistry I	3
CHEM-304L	Organic Chemistry Techniques I	1
HIST-PLHD	History Core Requirement	3
SOC-PLCR	Social Science Core Curriculum Req'm't	3
PSCI-PLGP1	Physics 1 Requirement	4
CHEM-304	Organic Chemistry I	3
CHEM-304L	Organic Chemistry Techniques I	1
HIST-PLCR2	History Core Requirement (World Civ)	3
SOC-PLCR	Social Science Core Curriculum Req'm't	3

Units **28**

Year 3 Term 2

PSCI-131	General Physics II	3
PSCI-131L	General Physics II Lab	1
BIOL-311	Genetics	3
BIOL-311L	Genetics Laboratory	1
BIOL-346C	Desert Field Ecology	4
HSPS-PLCR	History/Political Sci Core Requirement	3
PSCI-PLGP2	Physics 2 Requirement	4
BIOL-311	Genetics	3
BIOL-311L	Genetics Laboratory	1
BIOL-PLECO	Ecology Requirement	4
HIST-PLCR1	History Core Requirement (US History)	3

Units **30**

Year 4 Term 1

THEO-300C	Developing a Christian World View	3
BIOL-488	Biology Senior Project	2
ENGL-220C	Researched Writing	3
BIOL-PLHD8	Biology Elective 8 Units	8
THEO-300C	Developing a Christian World View	3
BIOL-488	Biology Senior Project	2
ENGL-220C	Researched Writing	3
BIOL-PLHD4	Biology Elective	4
BIOL-309	Microbiology	3
BIOL-309L	Microbiology Laboratory	1

Units **32**

Year 4 Term 2

BIOL-499C	Capstone Seminar in Biology	2
CHIS-400C	Christian Heritage	3
ENGL-230C	Literature and the Human Experience	3
BIOL-PLHD8	Biology Elective 8 Units	8
BIOL-499C	Capstone Seminar in Biology	2
CHIS-400C	Christian Heritage	3
ENGL-230C	Literature and the Human Experience	3

BIOL-PLHD8	Biology Elective 8 Units	8
	Units	32
	Total Units	236