

BIOLOGY B.S. WITH A CONCENTRATION IN BIOTECHNOLOGY

Requirements

Code	Title	Units
Core Curriculum Requirements (https://catalog.vanguard.edu/college/core-curriculum/)		44-42
Biology Major Core Requirements		52
Concentration in Biotechnology (p. 1)		29-28
Total Units		125-122

Biology Major Core Requirements

Code	Title	Units
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 on 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	
Total Units		52

Concentration in Biotechnology Science

Code	Title	Units
SOC-100C	Introduction to Sociology ¹	3
BUSN-215	Principles/Economics I-Macro	3
or BUSN-216	Principles/Economics II-Micro	
SOC-369 & 369L	Research Design & Methods and Research Design & Methods Lab	4
CSCI-100C & 100CL	Introduction to Computer Science and Introduction to Computer Science Lab	4-3
or MATH-207	Computer Programming	
MATH-265C	Intro to Statistical Methods	3
BIOL-405 & 405L	Bioinformatics and Bioinformatics Laboratory	4
BIOL-440 & 440L	Molecular Biology and Techniques in Molecular Biology	4
CHEM-430 & 430L	Biochemistry and Experimental Tech/Biochemistry	4
Total Units		29-28

¹ SOC-100C Introduction to Sociology is both a program requirement and fulfills a CORE Curriculum requirement.

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 coursework 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.

Study Abroad Participation: Students interested in participating in the university's Study Abroad programs are encouraged to reach out to the Global Education and Outreach Office (studyabroad@vanguard.edu) for more information and collaboration in their academic course planning. Students using Education and Training Benefits through the U.S. Department of Veteran Affairs are encouraged to also reach out to the School Certifying Official (veteranscertifyingofficial@vanguard.edu) for more information regarding how benefits can be applied.

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