

BIOLOGY B.S. WITH AN INTEGRATED TEACHER EDUCATION PROGRAM (ITEP)

Program Learning Outcomes

VU Biology graduates should be able to:

1. **Demonstrate** proficiency in *general biology concepts and theories*, as well as in self-selected biology sub-disciplines in order to succeed in careers and graduate programs.
2. **Illustrate** sufficient proficiency in *calculus, general chemistry, organic chemistry, and physics* in order to understand biological concepts involving these disciplines.
3. **Operate** basic *scientific instruments* necessary for biological investigations such as microscopes, centrifuges, spectrophotometers, electrophoresis equipment and pH meters thus demonstrating competency in *basic laboratory skills*, cell culture, and field techniques.
4. **Design** and conduct experiments –both individually and in small groups– using appropriate strategies such as: *collect, organize, analyze, interpret, and present quantitative & qualitative data and incorporate* them into the broader context of biological knowledge.
5. **Analyze and evaluate** various types of *scientific information* including primary research articles, mass media sources and world-wide web information.
6. **Disseminate** and *present biological data* with theoretical and historical perspectives –both in oral and written formats– to a diverse audience.
7. **Use critical and creative thinking to solve problems** by compiling and analyzing scientific information from library, electronic, and experimental sources. Effectively apply current technology and scientific methodologies for problem solving.
8. **Articulate** historical, current, and theoretical issues relating to biology and society within a Christ-centered worldview that allows for *evaluation of the relationship of scientific theories with ethical and religious perspectives*, particularly those common to Pentecostal Christians.

Requirements

This program is associated with the Integrated Teacher Education Program (ITEP)

Code	Title	Units
	Core Curriculum Requirements (https://catalog.vanguard.edu/interdisciplinary-offerings/core-curriculum/) ¹	43
	Biology Major Core Requirements	51
	General Electives	0
	Integrated Teacher Education Program Requirements (p. 1)	37
Total Units		131

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	Cell Biology	3
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 (lecture and lab must be taken concurrently):	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		51

Integrated Teacher Education Program Requirements

Code	Title	Units
Requirements:		
MATH-265C	Intro to Statistical Methods	3
or MATH-270C	Health Professions Statistical Methods	
POLS-155C	American Democracy ²	3
EDUC-315	Teaching in a Multicultural Setting	3
ENGL-453	Language, Culture, and Linguistics	3



Electives		
Select one UD lecture/laboratory combination from BIOL ³		4
Credentialing Coursework:		
EDUC-424	Foundations in Teaching for Single Subject	2
EDUC-426	Instructional Design and Subject Specific Pedagogy for Single Subject	4
EDUC-434	Curriculum Unit Planning for Single Subject	2
EDUC-435	Supervised Fieldwork for Single Subject	4
EDUC-442	CalTPA Cycle 1	0.5
EDUC-443	CalTPA Cycle 2	0.5
EDUC-444	Language Acquisition for Secondary Students	1
EDUC-447	Metacognition/Reading Strategies for Secondary Students	1
EDUC-452	Literacy in Content Areas for Secondary Students	1
EDUC-464	Use of Technology in the Classroom	1
EDUC-488	Clinical Practice Seminar for Single Subject	2
EDUC-489	Clinical Practice Fieldwork for Single Subject	8
Total Units		43

1

Number of units required from the Core Curriculum not included in the major requirements below.

2

POLS-155C American Democracy is both a CTC Credential requirement and fulfills a CORE Curriculum requirement.

3

In consultation with your academic advisor, select one lecture/lab combination that best aligns with your career goals. Additional course selections in Chemistry, Education, Environmental Sciences, Kinesiology, Mathematics, or Psychology may be 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 Biology.

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 for more information regarding how benefits can be applied.