How will my coursework be distributed?

Program Planning Worksheet

BIOLOGY MAJOR - Degree: Bachelor of Science

CELLULAR & MOLECULAR BIOLOGY CONCENTRATION

The Biology degree with a Cellular and Molecular Biology concentration prepares students to be at the cutting edge in modern cell and molecular biology and to be fully prepared to be competitive in applications for entry into graduate degree programs; medical, veterinary, or dental programs; or technical industrial jobs.

Students majoring in biology must complete a minimum of 120 semester hours **(SH)** in order to graduate. This includes satisfying the General Education **(GE)** course requirements, completing outlined areas of foundation, breadth, and depth courses, and appropriate elective requirements. Several of these courses can also be taken as part of the GE requirements. A minimum grade of C– or better is required in each biology and chemistry course. Required major courses include 22 SH of Foundation courses, 21 SH of Breadth courses, and 14 SH of Depth courses. In addition, during the senior year, all students must complete and present a Senior Reflection Project.

FOUNFATION COURSES (22 SH)

Course	SH	Grade
BIO 1313 General Biology I (GE)	3	
BIO 1113 General Biology I Lab (GE) *Co-requisite: BIO 2301*	1	
BIO 1314 General Biology II (GE)	3	
BIO 1114 General Biology II Lab (GE) *Co-requisite: BIO 2302*	1	
BIO 1307 Scientific Writing (GE) *Pre-requisite: Level I GE writing course*	3	
CHE 1313 Chemistry I (GE)	3	
CHE 1113 General Chemistry I Lab (GE) *Co-requisite: CHE 1313*	1	
CHE 1314 General Chemistry II (GE)	3	
CHE 1114 General Chemistry II Lab (GE) *Co-requisite: CHE 1314*	1	
Select 1 of the following courses: MAT 2326 Elementary Statistics (GE) GER 2326 Statistics for Social and Behavioral Sciences (GE) PSY 2326 Statistics for Social and Behavioral Sciences (GE) SOC 2326 Statistics for Social and Behavior Sciences (GE) MAT 3310 Probability and Statistics I EXS 2310 Demystifying the Statistics of the Health Sciences (GE) MAT 2317 Calculus I (GE) - possible prerequisite(s) required if student did not test into this course	3	
Total Foundation		

BREADTH COURSES (21 SH)

Course	SH	Grade
CHE 2326 Organic Chemistry - *CHE 2126 lab optional (1 SH)*	3	
PHY 1321 College Physics I	3	
PHY 1121 College Physics I Lab *Co-requisite: PHY 1321*	1	

Students must complete the remaining 14 hours by taking at least one course each from Areas I, II, III, and IV detailed below. To reach the remaining 14 hours, students may have to take an additional course from Area I or an optional laboratory course(s) from Areas II, III, or IV. Courses used to fulfill the breadth areas may not be used to fulfill depth concentration requirements.

Area I (2–4 SH): Bio-techniques and Lab Skills

Course	SH	Grade
Select 1 of the following course(s) BIO 1115 & 1315 Intro to Biotech w/ lab (3 SH & 1 SH) BIO 3201 Tissue Culture (2 SH) BIO 2277 Investigation & Research I (2 SH) BIO 3277 Investigation & Research II (2 SH) BIO 3333 Field Biology (3 SH)		
Optional Course (*if necessary*):		

Area II Area II (3–4 SH): Cells & Molecules

Course	SH	Grade
Select 1 of the following course(s) BIO 3337 Biomolecules (3 SH) - *BIO 3137 lab optional (1 SH)* BIO 3342 Introduction to Molecular Biology (3 SH) BIO 3364 Cell Biology (3SH) - *BIO 3164 lab optional (1 SH)*		
Optional Course (*if necessary*):		

Area III (3–4 SH): Structure & Function

Course	SH	Grade
Select 1 of the following course(s) BIO 3231/3232 Microbiology with lab (2 SH & 2 SH) BIO 3311/3111 Fund. of Anatomy and Physiology with lab (3 SH & 1 SH) BIO 3336 Developmental Bio (3SH) - *BIO 3136 lab optional (1 SH)* BIO 3343 Histology (3 SH) - *BIO 3143 lab optional (1 SH)* BIO 2311/2111 Anatomy & Physiology I with Lab (3 SH & 1 SH)		
Optional Course (*if necessary*):		

Area IV (3 SH): Heredity, Evolution, & Diversity

Course	SH	Grade
Select 1 of the following course(s) BIO 2310 Zoology (3 SH) - *BIO 2110 lab optional* (1 SH) BIO 2316 Botany (3 SH) - *BIO 2116 lab optional* (1 SH) BIO 3366 Genetics (3SH) - *BIO 3166 lab optional* (1 SH) BIO 3371 Ecology & Evolution (3 SH) - *BIO 3171 lab optional* (1 SH)		
Optional Course (*if necessary)*:		
Total Breadth		

DEPTH COURSES (14 SH)

Course	SH	Grade
BIO 4276 Seminar	2	
BIO 4277 Investigation and Research III	2	

To fulfill the cellular and molecular biology concentration students must complete ≥10 SH of any of the following depth courses:

BIO 3336	Developmental Biology (3 SH)
BIO 3136	Developmental Biology Lab (1 SH)
BIO 3343	Histology (3 SH)
BIO 3143	Histology Lab (1 SH)
BIO 3201	Tissue Culture (2 SH)
BIO 3364	Cell Biology (3 SH)
BIO 3164	Cell Biology Lab (1 SH)
BIO 4305	Integrative Metabolism (3 SH)
BIO 4105	Integrative Metabolism Lab (1 SH)
BIO 4347	Molecular Genetics (3 SH)
BIO 4147	Molecular Genetics Lab (1 SH)
BIO 4376	Biochemistry (3 SH)
BIO 4176	Biochemistry Lab (1 SH)
BIO 4310	Cancer Biology (3 SH)
PHY 3325	Intro to Biophysics (3 SH)
BIO 4423	Immunology (3 SH)
BIO 4123	Immunology Lab (1 SH)

Course	SH	Grade
Total Depth		

***Graduation Requirement: Department of Biological Sciences E-Portfolio Senior Project**

Refer to E-portfolio Guidelines and Checklist

Program Notes

General Education

The General Education curriculum is designed to foster the development of critical skills such as thinking, writing, and speaking, while offering students the opportunity to explore the vast fields that make up the academy. The General Education curriculum at Winston-Salem State University is designed to offer students a mix of the liberal arts as a foundation for the major. Students are required to take approximately one-half (a minimum of 60 semester hours) of their courses outside of their major field of study. Most of these courses are taken in the first two years at the university. Students have choice in the courses they take and are encouraged to sample widely across the curriculum. There are some minimum expectations about the courses taken in general education, dependent on the student's status upon entering the university. Students should work closely with their pre-major advisor in planning their course schedules prior to transitioning into the major.

The Biology Degree with Cellular and Molecular Biology Concentration

The student is responsible for the completeness and accuracy of registration and for determining the requirements of the selected program/concentration. It is strongly advised for students to read course descriptions before registering for a course to determine if they have necessary prerequisites**. Students who want to attend graduate, professional, or medical school may have additional requirements that are not required for the biology major, including a full year of organic chemistry with lab, a full year of physics with lab, and other courses. As requirements vary by school and program, students are strongly advised to investigate the requirements early, consult their advisor, and plan their schedules accordingly.** The course work emphasizes active learning and problem-solving skills, encourages interdisciplinary pursuits, and is committed to providing hands-on and intellectually challenging experiences in research labs.

Undergraduate Research

The Department of Biological Sciences encourages undergraduate students to become involved in research. It is a requirement for all majors made possible by various modes of directed research opportunities. Our faculty members adhere to the principle that the best way to learn science is by doing research, and laboratory research is a strongly encouraged supplement to undergraduate studies in the department.

Tips for Undergraduate Research:

Tips for a successful undergraduate research experience

Graduate School Preparation

Our department aims for its students to develop a deep understanding of current ideas and problems in molecular and cellular biology. At the same time, we help to build foundational skills in logic, reasoning, self-expression and communication-skills relevant to any career. Our goal is to prepare students for creative futures in the pursuit of scientific discovery, science education, or as knowledgeable representatives of science in society. A vast number of our alumni have had much success with being accepted into a variety of graduate STEM programs associated with cellular and molecular biology.

Graduate School Preparation

Resource:

1. Application Timeline: http://www.princetonreview.com/grad-school-advice/application-timeline

2. Tips: https://www.btaa.org/docs/default-source/diversity/gradschoolguide.pdf