

Department of Biological Sciences

**BACHELOR OF SCIENCE
PROGRAM OF STUDY**

Biotechnology Track

(BIOL:BS/ BIOTECH)

PLEASE READ COURSE DESCRIPTIONS in the UNDERGRADUATE COURSE CATALOG (catalog.fiu.edu). Most elective courses have prerequisites that must be taken **BEFORE** you take the elective course. To see your own progress, you can view your Panther Degree Audit from your My FIU. If you need assistance or have any questions, you are encouraged to see an advisor prior to each registration period by making an appointment via the Panther Success Network. All Biology faculty members serve as biology career advisors and have designated advising times. All Science and Math courses must be completed with a grade of "C" or better to satisfy the requirements. **The Biological Sciences BS has enrollment and completion success markers that will be used to monitor your progress in the major. In cases where students are not making good progress, a change of major may be required.**

The FIU Biotechnology track is designed for students interested in biotechnology research either in academia or industry. The purpose of this track is to guide students with a set of biotechnology related lecture and laboratory courses that will equip them with the background, essential laboratory skills, and bioinformatics necessary to be a competitive candidate for entry level laboratory research positions in the field of biotechnology.

LOWER DIVISION PROGRAM

- UCC –University Core Curriculum (**Note:** Transfer students with an AA degree from a Florida College System or other Florida State University are exempt from the UCC).
- GLOBAL LEARNING REQUIREMENT at Foundation Level and In-field/Discipline Specific Level (consider using upper division courses here)
- Civic Literacy Requirement
- Students entering the University with fewer than 60 hours must complete 9 hours of coursework during the summer semester
- Foreign Language requirement
- General Science Requirements** (also called Common Prerequisites)

<u>General Science Courses</u>	<u>FIU () = credit hours</u>	<u>BC or MDC equivalent</u>	<u>UM Equivalent</u>
<input type="checkbox"/> General Biology I and II	BSC 2010(3) +Lab(1) BSC 2011(3)+Lab(1)	BSC 2010+Lab or BOT 1010+Lab BSC 2011+Lab ZOO 1010+Lab	BIL 150 +151Lab BIL 160 + 161Lab
<input type="checkbox"/> General Chemistry I and II	CHM 1045(3)+Lab(1) CHM 1046(3)+Lab(1)	CHM 1045+Lab or CHM 1040+Lab CHM 1046+Lab CHM 1041+Lab	CHM 111 + 113Lab CHM 112 + 114Lab
<input type="checkbox"/> Organic Chemistry I and II	CHM 2210(4)+Lab(1) CHM 2211(3)+Lab(1)	CHM 2210+Lab CHM 2211+Lab	CHM 201 + 205Lab CHM 202 + 206Lab
<input type="checkbox"/> General Physics I and II	PHY 2053(4)+2048L(1) PHY 2054(4)+2049L(1)* using algebra and trigonometry or PHY 2048(4)+Lab(1) PHY 2049(4)+Lab(1)* using Calculus 1 and 2.	PHY 2053+Lab PHY 2054+Lab	PHY 101 + 106Lab PHY 102 + 108Lab

***Fundamentals of Data Science - CAP 2752(3)**, can be used to substitute Physics II only. Please check with your advisor to confirm this course falls in the appropriate category on the degree audit; also confirm whether this course is appropriate for career goals.

- Mathematics - Students must complete sub-requirements (A) and (B)

(A) Calculus I	MAC 2311(4)	MAC 2311	MTH 111 or MTH 131
(B) Calculus II	MAC 2312(4)	MAC 2312	MTH 112 or MTH 132
or			
*Statistics I and II	STA 3111(3) & 3112(3)	Stats designed for Biology students.	
	or		
	STA 2122(3) & 3123(3)	Stats designed for Psychology students	

Note: Calculus I and Statistics I together do not satisfy the requirement; STUDENTS WHO TAKE STATISTICS I AND II MUST ALSO COMPLETE CALCULUS. The Statistics sequence is preferred for students in this track.

Upper Division Program Requirements for Forensic Biotechnology Track (35 credits)

Core Courses	Pre-Requisites	Credits
PCB 3043 Ecology	BSC 2010 + BSC 2011	3
PCB 3063 Genetics	BSC 2010	3
PCB 4023 Cell Biology	PCB 3063 + CHM 1046	3
PCB 4674 Evolution	PCB 3043 + PCB 3063	3
BSC 3848 Science and Career Literacy	BSC 2010 & BSC 2011	1

Distribution Requirement- One lecture from each of the following areas. Areas B-D have required courses you must choose from.	Required Course	Pre-Requisites	Credits
A. Ecology Distribution	Must choose one course from the department's Distribution A (Ecology) area.	Depends on course chosen	3
B. Organismal Diversity Distribution	BSC 4434 Bioinformatics for Biologists (required)	BSC2010, BSC2011, PCB3063	3
C. Physiology/Biochemistry Distribution	BCH3033 General Biochemistry (required) – Fall 2024	CHM2211 and BSC2010	3
D. Structure/Development Distribution	BSC 4422 Biotechnology (required) – Fall 2024		3

Additional Upper Division Electives	Pre-Requisites	Credits
MCB 3020 General Microbiology (required)	CHM2210, BSC2010, and BSC2011	3
One additional Biology Upper Division Elective chosen at the student's discretion from courses in any of the distribution areas.	Depends on course chosen	3

* See next page for a list of elective courses to choose from

** Please note that there may be limited course availability in summer.

***Refer to course catalog for list of courses not applicable to the upper division Major electives: <http://catalog.fiu.edu/>

Lab Requirement-	Credits
BSC 3466L Make Your Mutant Lab (required)	1 – Fall 2024
BSC 4422L Biotechnology Lab (required)	1 – Fall 2024
Must select two additional labs from the list below:	
BCH 3033L General Biochemistry Lab	1 – Fall 2024
BSC 4401L Principles of Forensic Biology Lab	1
BSC 4450L Computational Biology Lab	1 – Fall 2024
MCB 3020L General Microbiology Lab	1 – Fall 2024
PCB 3063L Genetics Lab	1 – Fall 2024
PCB 4023L Cellular Biology Lab	1 – Fall 2024

College and University Requirements

Total Upper Division (3000-4000 level credits) required	45
Total credit hours required for graduation (University requirement)	120

ELECTIVES COURSES - DISTRIBUTION REQUIREMENT – Fall 2024

(L*)-Indicates that lab is being offered this term along with the lecture

Courses listed may be subject to change. Please confirm course availability by searching for courses on your MyFIU.

BSC 4473C - Introduction to Scientific Diving Prerequisites: (OCB3043+lab or PCB3043+lab or CHS4600 or OCE3014), open water diving certification, permission of the instructor, FIU Diving Medical clearance, pass standardized swim test, at least 18 years old. **Lab fee of \$1,158 applied.** Being offered **Fall 2024**.

BSC 4934 – Topics in Biology: Science Diplomacy. Being offered **Fall 2024**. Course satisfies upper division Biology Elective requirement and is of variable credit; students **MUST** enroll in 3 credits.

BSC 3941 - Biological Sciences Research Internship: Supervised, practical experience in a professional, laboratory or field setting in which biologists may work. Instructor permission is required. This does **NOT** fulfill any lab or elective lecture requirement for Biology Majors or Minors.

The non-major courses of BSC2085+L and BSC2086+L are also **NOT** applicable to Biology BS majors.

A. ECOLOGY

Fall 2024			Prerequisites (Grades of C or higher in)
BOT	4601	General Plant Ecology GL	PCB3043
BSC	4303	Biogeography GL	PCB 3043 and PCB 4674
BSC	4363	Biodiversity in the Caribbean Basin	BSC2010, BSC2011
OCB	3043	Marine Biology Oceanography (*L) GL	BSC2010, BSC2011
OCB	3075C	Mariculture for Conservation and Restoration	
OCB	3264	Coral Reef Biology	BSC2011
OCB	4104C	Field Methods in Marine Ecology	OCB3043 or PCB3043
OCB	4633	Marine Community Ecology	PCB3043
PCB	3374	Tropical Ecology	PCB3043
PCB	4301	Freshwater Ecology	PCB3043
PCB	4401	Global Change Ecology: How humans changed the face of Earth	PCB3043
PCB	4467C	Marine Protected Areas GL	BSC2010 and BSC2011

B. ORGANISMAL DIVERSITY

Fall 2024			Prerequisites (Grades of C or higher in)
BOT	3663	Tropical Botany	BSC2011
BOT	4404C	Phycology	BSC2010, BSC2011
MCB	3020	General Microbiology (*L)	CHM2210, BSC2010, and BSC2011
OCB	4303	Biology of Marine Mammals	PCB3043 or OCB3043
ZOO	3205C	Invertebrate Zoology GL	BSC1011

C. PHYSIOLOGY/BIOCHEMISTRY

Fall 2024			Prerequisites (Grades of C or higher in)
BCH	3033	General Biochemistry (*L)	CHM2211, BSC2010
CHM	4304	Biological Chemistry I (*L)	CHM2211, CHM2211L
BOT	4503	Plant Physiology GL	BSC2010, BSC2010L, BSC2011, CHM2210
MCB	4503	Virology	CHM2210, PCB3063
PCB	3702	Intermediate Human Physiology (L*)	BSC2010 or BSC2011
PCB	4232	Biology of AIDS	BSC2010, BSC2011, CHM1045, CHM1046
PCB	4233	Immunology	PCB3063
PCB	4524	Molecular Biology	PCB3063, (BCH3033 or CHM4304)
PCB	4776	Physiological and Behavioral Ecology of Marine Animals	BSC2010, BSC2011, and PCB3043
PCB	4810	Biology of Stress	BSC2010 and BSC2011
ZOO	4744	Neurobiology	BSC2010 and BSC2011

D. STRUCTURE/DEVELOPMENT

Fall 2024			Prerequisites (Grades of C or higher in)
BSC	4422	Biotechnology: Applications in Industry, Agriculture and Medicine (*L)	
PCB	4253	Developmental Biology	PCB3063 or BCH3033
PCB	4663	General Human Genetics	PCB3063
ZOO	3713C	Comparative Vertebrate Anatomy	BSC2010, BSC2011
			BSC 2010 or BSC 2023 or PCB 2099 or MCB 2000 or HSC 3549
ZOO	3731	Human Anatomy (*L)	Corequisite: ZOO3731L
ZOO	4733	Survey of Regional Anatomy	BSC2011+L, CHM1046+L, PHY2048 or PHY 2053

Transfer Students

Transfer students with >60 credits, must take half of their upper division credits at FIU. A **maximum** of 60 lower division semester hours taken at a two-year or a four-year institution may be counted toward the degree. A maximum of 30 upper division semester hours taken at a senior institution may be counted toward the degree. Lower division courses in **excess of 60** semester hours may serve to meet specific course requirements for the degree, but credit hours represented by these courses **will not** reduce the number of credit hours to be completed at the University.

To see more information on the other University requirements please visit the following websites:

- University Core Curriculum (UCC): <https://dasa.fiu.edu/all-departments/advising/index.html>
- Foreign Language (FLENT/FLEX), Summer Enrollment, Civic Literacy, and Global Learning (GL): <https://transfer.fiu.edu/transfer-101/graduation-requirements/>

Pre-Health Advising

Students interested in pre-health professions such as Medical, Dental, Optometry, Pharmacy, Physician Assistant, Podiatry, and/or Veterinary School, are encouraged to meet with a Pre-Health Advisor for arranging a curriculum to enhance their potential to gain admission to these professional schools. Please visit their website for more information at: <https://case.fiu.edu/pre-health/>

Enrollment Status – for continuous enrollment in a semester, dropping courses can change enrollment status. Contact the Registrar for more details. Contact Financial Aid for various regulations.

Full time = 12 to 18 credits. Normal load = 15 credits; registration for more than 18 credits requires Dean Designee Approval.
Half time = 6-11 credits; Less than Half time = 5 credits or less.

Minor in Biology

The requirements to complete a Minor in Biology can be found here: <https://case.fiu.edu/advising/case-minor/biology-minor.pdf>
Students who would like to request the addition of a minor may submit their request online at: <https://go.fiu.edu/CASEminor>

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