

APPLIED HEALTH SCIENCES (BAS), BIOTECHNOLOGY SPECIALIZATION

Previous Degree Required: A.S./A.A.

Eligible for Financial Aid: Yes

Delivery Method(s): On-Campus, Hybrid

Location(s): All campuses and online

Limited Access: No

Program Testing Requirements: Not Required

Academic Community: HSCI

Program Code: HSBSBIOT

Classification of Instructional Programs (CIP) Code: 51.2211

Florida Department of Education CIP Code: 1105122111

This is a specialization of the BAS Applied Health Sciences degree.

Admissions requirements: There are no additional admissions requirements for this specialization.

Note: Students wishing to enter the Medical Laboratory Technology or Medical Laboratory Science field should complete the Medical Laboratory Technology A.S. degree prior to beginning this program. This program is most appropriate for students with an A.S. degree in Chemical Technology or Medical Laboratory Technology, or A.A. students with a strong focus in Chemistry or Biotechnology.

Refer to the [Bachelor of Applied Science \(BAS\) overview page](#) to find information about admission, graduation, general education and other requirements. Students who need technical electives will work with a bachelor's advisor to determine the courses best suited to their plan of study.

Visit the [program page](#) for more information.

Program of Study

Code	Title	Credit Hours
Associate Degree		60
Credits earned from Associate Degree		
Applied Health Sciences Major Courses		
HSC 3741	Writing for Healthcare Professionals	3
ISC 3523	Applied Scientific Thinking	3
Biotechnology Specialization Courses		36
ATEC 4640	Laboratory Animals and the IACUC	
BCH 4024	Introduction to Biochemistry and Molecular Biology	
BCHC 4103	Biochemical Methods	
BSCC 4422	Methods and Applications in Biotechnology 2	
HSC 3740	Quality Assurance for the Biomedical Sciences Laboratory	
HSA 4910 & HSC 3801 or HSC 4851	Capstone: Case Studies in Biomedical Science and Clinical Observation/Volunteer Work ¹ or Health Sciences Internship	
HSCC 3543	Quantitative Biomedical Laboratory Methods	
HSCC 4544	Quantitative Biomedical Laboratory Instrumentation	

MCBC 3020	Biology of Microorganisms	
PCB 3063	Genetics	
Biotechnology Technical Electives		18
Select 18 credit hours from the following:		18
ANS 3440	Principles of Animal Nutrition	
BSC 3424	Nanotechnology	
BSC 4434	Bioinformatics	
BSC 4870	Principles of Pharmacology	
BSC 4911	Individual Mentored Research in Biology	
HSA 3502	Healthcare Risk Management	
HSC 3201	Community Health	
HSC 3537	Health and Medical Terminology	
HSC 4184	Healthcare Leadership	
HSC 4404	Medical Disaster Management	
MCB 4203	Bacterial and Viral Pathogenesis	
PCB 3134	Cell Biology	
PCB 4234	Biology of Cancer	
PHC 4094	Introduction to Biostatistics for Health Science and Public Health	
ZOO 4911	Individual Mentored Research in Zoology	
ZOOC 4232	Comparative Parasitology	
ZOOC 4603	Developmental Biology	

Biotechnology Support Courses

Students may select up to 8 credits from the following Support Courses as part of their 18 Biotechnology electives.

BSCC 1011	General Biology 2	
BSCC 1426	Introduction to Biotechnology Methods	
BSCC 1427	Introduction to Biotechnology Methods 2	
CHM 1045	General Chemistry 1	
CHM 1046	General Chemistry 2	
CHM 2210	Organic Chemistry 1	
CHM 2211	Organic Chemistry 2	
CHML 1045	General Chemistry 1 Laboratory	
CHML 1046	General Chemistry 2 Laboratory	
CHML 2210	Organic Chemistry 1 Laboratory	
CHML 2211	Organic Chemistry 2 Laboratory	
MAC 2311	Calculus 1 with Analytic Geometry	
MAC 2312	Calculus 2 with Analytic Geometry	
PHY 2048	General Physics 1	
PHY 2049	General Physics 2	
PHYL 2048	General Physics 1 Laboratory	
PHYL 2049	General Physics 2 Laboratory	

Total Hours: **138**

In accordance with Florida Statute and Florida Administrative Code, students must

- Satisfy the [foreign language competency](#) requirement
- Satisfy the [Civic Literacy Graduation Requirement](#).

¹ Students may take [HSC 3801](#) Clinical Observation/Volunteer Work and [HSC 4851](#) Health Sciences Internship or [HSC 4851](#) Health Sciences Internship (total 3 credits)

Course Sequence

Below is the recommended sequence for taking courses in this degree. Using this guide and meeting with your assigned advisor each term is the key to successful program completion.

Please note that course prerequisites, including required developmental math, reading, or writing, need to be completed to continue on to the more advanced course. Courses followed by "&" have prerequisites that are not part of this program. Click on the course number to see the requirements.

Code	Title	Credit Hours
HSC 3741	Writing for Healthcare Professionals ^{Sp, Su}	3
ISC 3523	Applied Scientific Thinking	3
Biotechnology Science Elective Course ¹		3
Biotechnology Science Elective Course ¹		3
Biotechnology Science Elective Course ¹		3
Biotechnology Science Elective Course ¹		3
ATEC 4640	Laboratory Animals and the IACUC ^{&}	4
HSCC 3543	Quantitative Biomedical Laboratory Methods	4
BCH 4024	Introduction to Biochemistry and Molecular Biology ^{Fa, Sp}	4
BSCC 4422	Methods and Applications in Biotechnology 2 ^{Su}	4
HSC 3740	Quality Assurance for the Biomedical Sciences Laboratory	3
BCHC 4103	Biochemical Methods ^{Sp}	2
HSCC 4544	Quantitative Biomedical Laboratory Instrumentation ^{Sp}	4
MCBC 3020	Biology of Microorganisms ^{&, Sp}	5
Biotechnology Science Elective Course ¹		3
PCB 3063	Genetics ^{Sp}	3
Biotechnology Science Elective Course ¹		3
HSA 4910 & HSC 3801 or HSC 4851	Capstone: Case Studies in Biomedical Science and Clinical Observation/Volunteer Work ^{2, Su} Health Sciences Internship	3
Total Hours:		60

² Take HSC 4851 Health Sciences Internship (3 credits) or both HSA 4910 Capstone: Case Studies in Biomedical Science and HSC 4851 Health Sciences Internship (3 credits). Capstone course is to be taken in student's final term.

- If no term is designated, course is offered every term

Fa Course offered in fall term

Sp Course offered in spring term

Su Course offered in summer term

Listed below are the approved courses that satisfy the Technical Concentration requirement for your degree program. Students must select their courses only from this designated list.

Please note that a single course may not be used to fulfill more than one requirement. For example, a course applied toward Technical Concentration cannot also be used as a Specialization course or applied to any other category.

Before finalizing your selections, be sure to confirm that you have not previously completed any of the courses you intend to use to meet the Technical Concentration. Work with a bachelor's advisor to determine the courses best suited to your plan of study.

Code	Title	Credit Hours
ANS 3440	Principles of Animal Nutrition	4
BSCC 1011	General Biology 2	4
BSCC 1426	Introduction to Biotechnology Methods	4
BSCC 1427	Introduction to Biotechnology Methods 2	4
BSC 3424	Nanotechnology	3
BSC 4434	Bioinformatics	3
BSC 4870	Principles of Pharmacology	3
BSC 4911	Individual Mentored Research in Biology	1-4
CHM 1045	General Chemistry 1	3
CHM 1046	General Chemistry 2	3
CHM 2210	Organic Chemistry 1	3
CHM 2211	Organic Chemistry 2	3
CHML 1045	General Chemistry 1 Laboratory	1
CHML 1046	General Chemistry 2 Laboratory	1
CHML 2210	Organic Chemistry 1 Laboratory	1
CHML 2211	Organic Chemistry 2 Laboratory	1
CHMC 3120	Analytical Chemistry with Laboratory	4
HSA 3502	Healthcare Risk Management	3
HSC 3201	Community Health	3
HSC 3537	Health and Medical Terminology	3
HSC 4184	Healthcare Leadership	3
HSC 4404	Medical Disaster Management	3
MAC 2311	Calculus 1 with Analytic Geometry	5
MAC 2312	Calculus 2 with Analytic Geometry	5
MCB 4203	Bacterial and Viral Pathogenesis	3
MCBC 3020	Biology of Microorganisms	5
PCB 3134	Cell Biology	3
PCB 4234	Biology of Cancer	3
PHC 4094	Introduction to Biostatistics for Health Science and Public Health	3
PHY 2048	General Physics 1	4
PHY 2049	General Physics 2	4
PHYL 2048	General Physics 1 Laboratory	1
PHYL 2049	General Physics 2 Laboratory	1
ZOO 4911	Individual Mentored Research in Zoology	1
ZOOC 4232	Comparative Parasitology	4
ZOOC 4603	Developmental Biology	5

Learning Outcomes

- Analyze biological processes at all levels of organization: molecular, cellular and microbial, organismal, population, and ecosystem
 - *Core Ability Supported: Think Critically and Solve Problems*
- Write a technical biological/bio-medical paper

- *Core Ability Supported: Work Cooperatively*
- 3. Explain the importance of unifying concepts in biology, including cell theory, genetics and evolution
 - *Core Ability Supported: Think Critically and Solve Problems*
- 4. Apply laboratory skills in support of bio-medical systems
 - *Core Ability Supported: Process Information*
- 5. Evaluate historical developments and research in the biological and bio-medical sciences
 - *Core Ability Supported: Think Critically and Solve Problems*
- 6. Analyze data and scientific literature
 - *Core Ability Supported: Communicate Effectively*
- 7. Apply scientific methods in laboratory-based and field-based inquiry
 - *Core Ability Supported: Process Information*
- 8. Characterize awareness of professional, ethical and global issues in a diverse society
 - *Core Ability Supported: Model Ethical and Civic Responsibility*