

Bioscience Certificate (BSCC)

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The Bioscience Certificate is designed for students interested in exploring a new career path in a biotechnological setting.

Graduates who earn the Bioscience Certificate along with the Associate of Science degree (or who previously completed an Associate of Science or Bachelor of Science degree with focus in biological science) are prepared for employment opportunities as laboratory assistants or technicians in a wide range of settings.

Possible assignments include roles in the private sector biotechnology industry and academic-based biological research institutions.

Students who earn the Bioscience Certificate gain experience in laboratory safety, regulations, skills, and methodology as well as competencies in creating standard operating procedures, maintaining records, analyzing data, and other skills.

Topics covered in the certificate include genetic engineering, forensics, protein purification, animal models, electrophoresis technology, and PCR (polymerase chain reaction).

Employees in biological science and biotechnology fields are expected to pay close attention to detail, understand and follow experimental or manufacturing protocols, maintain clean environments, solve problems related to experimentation or manufacturing issues, and analyze data to draw conclusions and adjust procedures.

For more information, please contact the Health and Public Safety Division at (513) 569-1670.

To apply for this program at Cincinnati State, visit the Admissions (<http://www.cincinnati-state.edu/academics/admission/>) section of the College website.

Bioscience Certificate (BSCC)

Program Prerequisites: BIO 131, CHE 121, and CHEM 131

Semester 1		Lec	Lat	Credits
BSC 115	Introduction to Bioscience	3	3	4
BIO 220	Microbiology	2	3	3
Semester 2				
BSC 205	Molecular Genetics Laboratory	2	6	5
BSC 150	Scientific Literacy for Bioscience	2	0	2
Semester 3				
BSC 210	Protein Purification and Analysis	2	6	5
BSC X9X		2	40	2
Bioscience Cooperative Education Elective				
Total Credits:		13	58	21

Electives

Bioscience Cooperative Education Elective (Take 2 credits)

BSC 191	Part-Time Cooperative Education 1: Bioscience	1
BSC 192	Part-Time Cooperative Education 2: Bioscience	1
BSC 291	Full-Time Cooperative Education 1: Bioscience	2

Some courses are offered in alternative versions identified with a letter after the course number-- for example, ENG 101 and ENG 101A.

- This curriculum displays only course numbers without the added letter.
- The alternative version, when available, meets the requirements of the course version without the added letter.

Faculty

Advisor

Milene Donlin, MS, MPH, CHES
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Courses

BSC 100 Survey of Bioscience and Biotechnology 2 Credits. 2 Lecture Hours. 0 Lab Hour.

An introductory course on the disciplines and scope of bioscience and biotechnology. Topics include: applications of bioscience and biotechnology, medical advances, bioethics, current developments, and career opportunities.

Prerequisites: ENG 085 and MAT 093, or appropriate placements

BSC 115 Introduction to Bioscience 4 Credits. 3 Lecture Hours. 3 Lab Hours.

A course on techniques, methodology, skills, and regulations used in bioscience laboratory settings. Topics include: standard operating procedures (SOPs) including record-keeping and data analysis, aseptic technique, solution and media preparation, laboratory management, and foundational elements of microscopy, microbiology, spectroscopy, genetic engineering, animal models in research, and troubleshooting experiments and protocols.

Prerequisites: BIO 131 and CHE 121 and CHE 131 (minimum grade C for all)

Corequisites: BIO 132, CHE 122, CHE 132

BSC 120 Cell Culture 2 Credits. 0 Lecture Hour. 6 Lab Hours.

A course on skills and techniques necessary to perform cell culture. Topics include: cell counts, biosafety, plant culture, yeast culture, mammalian cell culture, and fermentation techniques.

Prerequisites: BSC 115

BSC 150 Scientific Literacy for Bioscience 2 Credits. 2 Lecture Hours. 0 Lab Hour.

A course on reading, writing, and speaking skills for science professionals. Topics include: style and structure for scientific journal articles, the peer review process, and oral presentations of scientific information.

Prerequisites: None

BSC 160 Quality and Compliance in Biomanufacturing

3 Credits. 3 Lecture Hours. 0 Lab Hour.

A course on quality assurance elements in biomanufacturing industries. Topics include: current Good Manufacturing Practices (cGMPs), lean manufacturing and Six Sigma, root cause analysis, validation and calibration, and regulatory compliance. Students must attend field trips to local biomanufacturing companies.

Prerequisites: BSC 108

BSC 191 Part-Time Cooperative Education 1: Bioscience

1 Credit. 1 Lecture Hour. 20 Lab Hours.

Students seeking an associate's degree participate in their first part-time field learning experience related to their degree. Students are expected to register for academic courses during the same semester. Students must follow cooperative education policies and procedures in order to earn credit. Grades issued are Satisfactory or Unsatisfactory.

Prerequisites: BIO 132 and (BSC 205 or BSC 210) (minimum grade C for all)

BSC 192 Part-Time Cooperative Education 2: Bioscience

1 Credit. 1 Lecture Hour. 20 Lab Hours.

Students seeking an associate's degree participate in their second part-time field learning experience related to their degree. Students are expected to register for academic courses during the same semester. Students must follow cooperative education policies and procedures in order to earn credit. Grades issued are Satisfactory or Unsatisfactory.

Prerequisites: BSC 191

BSC 205 Molecular Genetics Laboratory

5 Credits. 2 Lecture Hours. 6 Lab Hours.

A course on molecular genetics techniques. Topics include: DNA and RNA isolation and purification, constructing screening libraries, electrophoresis, vector construction, Southern blot, PCR, DNA sequencing, and microarrays.

Prerequisites: BSC 115 and BIO 220 (minimum grade C for both)

Instructor Consent Required

BSC 210 Protein Purification and Analysis

5 Credits. 2 Lecture Hours. 6 Lab Hours.

A course on isolation, purification, and analysis of proteins from cells. Topics include: chromatography, electrophoresis, Western blot, enzyme assays, proteomics, ELISA, and other immunochemistry methods for detecting proteins.

Prerequisites: BSC 115 and BIO 220 (minimum grade C for both)

BSC 230 Introduction to Bioinformatics

3 Credits. 3 Lecture Hours. 0 Lab Hour.

A course on computer applications, statistics, and genetics used in computational biology and bioinformatics. Topics include: the Human Genome and Human Proteome projects, multiple sequence analysis, genetic conditions and trends, and use of databases such as BLAST, FASTA, and Entrez.

Prerequisites: BIO 111 or BIO 131

BSC 280 Bioscience Capstone Project

2 Credits. 0 Lecture Hour. 4 Lab Hours.

Students design and perform a project under the supervision of a Bioscience instructor. Topics include: planning a budget, and documenting project results.

Prerequisites: BIO 132, and (BSC 205 or BSC 210)

BSC 291 Full-Time Cooperative Education 1: Bioscience

2 Credits. 1 Lecture Hour. 40 Lab Hours.

Students seeking an associate's degree participate in their first full-time field learning experience related to their degree. Students must follow cooperative education policies and procedures to earn credit. Grades issued are Satisfactory or Unsatisfactory.

Prerequisites: BIO 132 and (BSC 205 or BSC 210) (minimum grade C for all)

BSC 294 Internship 1: Bioscience

2 Credits. 1 Lecture Hour. 40 Lab Hours.

Students seeking an associate's degree participate in their first unpaid field learning experience related to their degree. Students must follow applicable policies and procedures to earn credit. Grades issues are Satisfactory or Unsatisfactory.

Prerequisites: BIO 132, BSC 205, or BSC 210 (minimum grade C for all)