ALAMANCE COMMUNITY COLLEGE

BIOTECHNOLOGY

ORIENTATION AND PROGRAM MANUAL

AY 2024-25

ALAMANCE COMMUNITY COLLEGE
BIOTECHNOLOGY DEPARTMENT
ORIENTATION & POLICY MANUAL
TABLE OF CONTENTS

Alamance Community College

ACC Accreditation

Alamance Community College is part of the North Carolina Community College System.

Alamance Community College is accredited by the Southern Association of Colleges and Schools Commission on Colleges to award certificates, diplomas, and associate degrees. Questions about the accreditation of Alamance Community College may be directed in writing to the Southern Association of Colleges and Schools Commission on Colleges at 1866 Southern Lane, Decatur, Georgia 30033-4097, by calling 404-679-4500, or by using information available on SACSCOC's website (www.sacscoc.org).

Vision, Mission, & Values

Vision

Transforming lives through excellence in teaching, learning, and service.

Mission

Alamance Community College provides educational programs and services to prepare all members of our diverse community to succeed.

Values

1. Excellence – We hold ourselves to the highest expectations and are committed to meeting them with integrity.
2. Learning – We provide high-quality educational experiences that help people gain the knowledge, skills, behaviors, and values necessary to achieve their goals.
3. Community – We promote collaboration and partnerships through respectful interactions.
4. Equity and Inclusion – We embrace the diversity of our communities, work to ensure that each person feels a sense of belonging, and provide access to the resources people need to succeed.
5. Innovation – We are open to change, creativity, and risk-taking that help us achieve our mission and goals.

Revised by the Board of Trustees – August 8, 2022

Program Mission & Goals

To educate and train students to prepare for a career in the life sciences and biotechnology industries, by providing a hands-on, inquiry based learning environment, creating real-world learning opportunities coupled with career coaching.

Alamance Community College
Biotechnology Program

Faculty Contact Information

Michelle Sabaoun, MS
Dept. Head, Biotechnology
Office: C104D
Phone: (336) 506-4224
mgsabaoun486@alamancecc.edu

David Battigelli, MSPH, PhD
Biotechnology Faculty
Office: C104C
Phone: (336) 532-5052
Email: dabattigelli189@alamancecc.edu

Faculty Office Hours

Faculty office hours are listed in the syllabus for each course and posted on faculty office doors. Contact an instructor if you need to schedule an appointment outside of instructor office hours.

Questions & Answers About Biotechnology

What is a biotechnician?
A biotechnician is a professional who works in the field of biotechnology, applying principles of biology, chemistry, and technology to solve problems and develop products in various industries such as healthcare, agriculture, and environmental science. Biotechnicians may work in laboratories, assisting scientists in conducting experiments, analyzing data, and maintaining equipment. They may also be involved in tasks such as sample preparation, quality control, and documentation. Depending on their specific role and expertise, biotechnicians may work with a wide range of organisms, from microorganisms to plants and animals, and utilize various techniques such as genetic engineering, tissue culture, and molecular biology methods.

What job opportunities are available for biotechnicians in this area?
Job opportunities in the life sciences include assisting and supporting contract research organizations, diagnostic testing companies, and biopharmaceutical manufacturers — and they need help from people like you to improve and save lives.

Careers in these industries range from lab technologists and project management to quality control/assurance and process engineering. Explore some of the careers available, find an option that fits your skills and personality, and contribute to work that changes lives. Some companies our graduates work at are; Biogen, Burlington Labs, Burt's Bees, Carolina Biological, IDT, Labcorp, Lonza, Pfizer, and Zen Bio.

What is the approximate salary range for biotechnicians in this area?
The average entry level salary for individuals with a 2 year degree is $55,000, but overall the industry average is $96,000.

Curriculum Description

Our program trains students to work as research assistants or technicians within a variety of industry and research based settings. Students gain **hands-on experience** in a new state-of-the-art facility. Each student gains extensive laboratory skills necessary to enter the workforce directly, or to continue their education elsewhere (participants will accumulate over 700 hours of hands-on experience in the laboratory during their course of study for the AAS).

This program focuses on the application of the biological sciences, biochemistry, and genetics to the preparation of new and enhanced agricultural, environmental, clinical, and industrial products, including the commercial exploitation of microbes, plants, and animals. Potential coursework includes instruction in general biology, general and organic chemistry, biochemistry, molecular biology, immunology, microbiology, genetics, and cellular biology.

Program Strategic Learning Objectives (SLOs)

1. Demonstrate the ability to utilize laboratory math and basic laboratory equipment such as pipets, pH meters, analytical balances, and the glassware required to prepare solutions.
    - Assessed in BTC 181 as 3 consecutive laboratory practicals on making solutions (three lab practicals throughout semester)

2. Utilize documentation effectively by adhering to GMP and ALCOA document control principles to generate, follow, and maintain records, specifically focusing on electronic forms.
    - Assessed in BTC 281 as a GMP documentation exercise - (must submit a final electronic document completed by week 4)

3. Ability to run a diagnostic assay, interpret data, determine an abnormal outcome, and troubleshoot the problem through root cause analysis.
    - Assessed in BTC 287 as a PCR test for quantification of product produced in the lab. Students will troubleshoot false positives and false negatives. (by week 15)

4. Employ regulatory guidance in order to address safety concerns, improve a process, and document change utilizing CAPA (corrective action / preventative action).
    - Assessed in BTC 281 as a classroom exercise where student groups must work as a team to complete a complex process improvement task and submit a formal report following CAPA FDA guidelines. (by Week 16)

5. Capacity to follow a complex, multi-stage protocol resulting in analysis of a product, while adhering to standard operating procedures.
    - Assessed in BTC 287 as a laboratory assessment as it pertains to DNA extraction, analyzing the product and preparing it for DNA sequencing. (During module 8)

6. Demonstrate the ability to complete lab based competencies in aseptic technique, which contribute to maintaining contaminant-free cell lines.
    - Assessed in BTC 285 Cell Culture, as a formal lab assessment in which students must complete 4 passages of antibiotic-free CHO-K1 cells without contamination. (End of semester due date)

Degree Programs available

- Biotechnology
    - AAS (A20100B)
    - Advanced Laboratory Techniques Diploma (D20100)
    - Basic Laboratory Techniques Certificate (C20100B)

- Agricultural Biotechnology
    - AAS (A20100A)
    - Agricultural Biotechnology Certificate (C20100A)

- Biopharma Quality (FA2025)
    - AAS (A20100P)

Certification Possibilities

Biowork certification (with completion of Biowork course or BTC 181)

Employment Opportunities

Employment opportunities include positions in laboratories within universities or industry in research and development, quality control, medical diagnostics, pharmaceutical manufacturing, among a variety of other opportunities related to the life sciences.

Articulation Agreements

ACC's biotechnology program has transfer agreements with the following 4 year institutions and programs:

- East Carolina University, AAS in biotechnology to BSIT (Bachelor's of Science in Industrial Technology) or BS in Biology
- North Carolina Central University, AAS in biotechnology to BS in Pharmaceutical science
- University of North Carolina at Greensboro, AAS in biotechnology to BA/BS in Biology

Program Outcome Measures

To fulfill the mission and goals of the biotechnology program, the following Program Outcome Measures are designed to ensure that students will achieve the following learning objectives:

- Students successfully meet the program strategic learning outcomes
- Students successfully complete all coursework within the credential, earning a C or better in biotechnology and all science courses.

Biotechnology Curriculum Plan

Students may enter the biotechnology curriculum any semester.

BIOTECHNOLOGY (A20100B)
BIO-ANALYTICAL LABORATORY
TECHNOLOGY ADVISING SHEET
ASSOCIATE IN APPLIED SCIENCE

ENG 002		**MAT 003**	

Name: _____

Datatel ID#: _____

FIRST FALL SEMESTER				
Course Prefix & Number	**Course Title**	**Semester & Year**	**Grade**	**Credit Hours**
BIO 111	General Biology I (F, Sp, Su)			4
BTC 181	Basic Lab Techniques (F, Sp)			4
CHM 131 and CHM 131A or CHM 151	Introduction to Chemistry and (F) Introduction to Chemistry Lab (F) or General Chemistry I (F, Sp)			3 1 4
ENG 111	Writing and Inquiry (F, Sp, Su)			3
	TOTAL			**15**
FIRST SPRING SEMESTER				
Course Prefix & Number	**Course Title**	**Semester & Year**	**Grade**	**Credit Hours**
BIO 112	General Biology II (F, Sp) or Cell Biology (proposed)			4
BIO 275 or BTC 275	Microbiology (F, Sp) or Industrial Microbiology (Sp)			4
BTC 281	Bioprocess Techniques (Sp)			4
CHM 132 or CHM 152	Organic and Biochemistry (Sp) or or General Chemistry II (F. Sp)			4
	TOTAL			**16**
SUMMER – 3rd Semester				
MAT 152	Statistical Methods (F, Sp, Su)			4
	TOTAL			**4**

SECOND FALL SEMESTER				
Course Prefix & Number	**Course Title**	**Semester & Year**	**Grade**	**Credit Hours**
BIO 250	Genetics (F)			4

BTC 285	Cell Culture (F)			4
BIO / BTC / PTC Elective: BIO 140/140A or BIO 168 or BTC 150 or BTC 182 or PTC 110	 Environmental Biology/Lab (3+1) Anatomy & Physiology I (4) Bioethics (3) – (Su) Pharma Tech I (4) Industrial Environment (3)			3-4
ENG 114 or ENG 112 or COM 110 or COM 231	Prof Research & Reporting (F, Sp, Su) Writing and Research in the Disciplines Introduction to Communications Public Speaking			3
	TOTAL			**14-15**
SECOND SPRING SEMESTER				
Course Prefix & Number	**Course Title**	**Semester & Year**	**Grade**	**Credit Hours**
BTC 286	Immunological Techniques (Sp)			4
BTC 287	Advanced Molecular Techniques (Sp)			4
ELECTIVE	Humanities/Fine Arts Elective (F, Sp, Su)			3
ELECTIVE	Social/Behavioral Sciences Elective (F, Sp, Su)			3
	TOTAL			**14**
SUMMER – 6th Semester				
BTC 288 or WBL 112	Biotechnology Laboratory Experience (F, Sp, Su) Work Based Learning I			**2**
	GRAND TOTAL			**65-66**

BIOTECHNOLOGY (A20100A)
AGRICULTURAL BIOTECHNOLOGY ADVISING SHEET
ASSOCIATE IN APPLIED SCIENCE

ENG 002		**MAT 003**	

Name: _____

Datatel ID#: _____

FIRST FALL SEMESTER				
Course Prefix & Number	**Course Title**	**Semester & Year**	**Grade**	**Credit Hours**
BIO 110 or BIO 111	Principles of Biology (F, Sp, Su) or General Biology I			4
BTC 181	Basic Lab Techniques (F, Sp)			4
CHM 131 and CHM 131A or CHM 151	Introduction to Chemistry and (F) Introduction to Chemistry Lab (F) or General Chemistry I (F, Sp)			3 1 4
MAT 152	Statistical Methods (F, Sp, Su)			4
	TOTAL			**16**
FIRST SPRING SEMESTER				
Course Prefix & Number	**Course Title**	**Semester & Year**	**Grade**	**Credit Hours**
BTC 250 or BTC 275	Principles of Genetics (F, Sp, S) – BIO 110 prereq or Industrial Microbiology (Sp) BIO 110 prereq			4
ENG 111	Writing and Inquiry (F, Sp, Su)			3
BTC 281	Bioprocess Techniques (Sp) BTC 181 prereq			4
CHM 132 or CHM 152	Organic and Biochemistry (Sp) or General Chemistry II (F. Sp)			4
	TOTAL			**15**
SUMMER – 3rd Semester				
BTC 150	Bioethics			3
	TOTAL			**3**

SECOND FALL SEMESTER				
Course Prefix & Number	**Course Title**	**Semester & Year**	**Grade**	**Credit Hours**

BTC 285	Cell Culture (F) BIO 111 pre-req			4
AGR 170	Soil Science			3
HOR 162	Applied Plant Science			3
HOR 164	Hort Pest Management			3
Elective	Humanities/Fine Arts Elective (F, Sp, Su)			3
	TOTAL			**16**
SECOND SPRING SEMESTER				
Course Prefix & Number	**Course Title**	**Semester & Year**	**Grade**	**Credit Hours**
HOR 168	Plant Propagation			3
HOR 134	Greenhouse Operations			3
AGR 139	Intro to Sustainable Ag			3
ENG 115 or COM 231	Oral Communication or Public Speaking			3
ELECTIVE	Social/Behavioral Sciences Elective (F, Sp, Su)			3
	TOTAL			**15**
SUMMER – 6th Semester				
BTC 288 or WBL 112	Biotechnology Laboratory Experience (F, Sp, Su) Work Based Learning I			**2**
	GRAND TOTAL			**67**

BIOTECHNOLOGY (A20100P)
BIOPHARMA QUALITY
ADVISING SHEET
ASSOCIATE IN APPLIED SCIENCE

ENG 002		**MAT 003**	

Name: _____

Datatel ID#: _____

FIRST FALL SEMESTER				
Course Prefix & Number	**Course Title**	**Semester & Year**	**Grade**	**Credit Hours**
BIO 110	Principles of Biology			4
BTC 181	Basic Lab Techniques (F, Sp)			4
CHM 131 and CHM 131A	Introduction to Chemistry and (F) Introduction to Chemistry Lab (F)			3 1
MAT 110 or higher	Math Measurement & Literacy or higher			3
	TOTAL			**15**
FIRST SPRING SEMESTER				
Course Prefix & Number	**Course Title**	**Semester & Year**	**Grade**	**Credit Hours**
BTC 275	Industrial Microbiology (Sp)			4
ENG 111	English Comp			3
BTC 281	Bioprocess Techniques (Sp)			4
CHM 132	Organic and Biochemistry (Sp)			4
	TOTAL			**15**
SUMMER – 3rd Semester				
BTC 150	Bioethics			3
ENG 114 or ENG 112 COM 110 COM 231	Writing in the Disciplines			3
	TOTAL			**6**
SECOND FALL SEMESTER				
Course Prefix & Number	**Course Title**	**Semester & Year**	**Grade**	**Credit Hours**
BTC 182	Pharma Lab Techniques I (BTC 181 prereq) (1st 8 weeks)			4
PTC 110	Industrial Environment (3rd 4 weeks)			3
PTC 222	Pharm Process Control (4th 4 weeks)			3

ELECTIVE	Humanities/Fine Arts			3
	TOTAL			**13**
SECOND SPRING SEMESTER				
Course Prefix & Number	**Course Title**	**Semester & Year**	**Grade**	**Credit Hours**
BTC 183	Pharma Lab Techniques II (BTC 182 prereq) (1st 8 weeks)			4
PTC 120	Pharm Quality Control (3rd 4 weeks)			4
PTC 226	Validation (4th 4 weeks)			3
ELECTIVE	Social/Behavioral Sciences Elective (F, Sp, Su)			3
	TOTAL			**14**
SUMMER – 6th Semester				
BTC 288 or WBL 112	Biotechnology Laboratory Experience (F, Sp, Su) or Work Based Learning I			**2**
	GRAND TOTAL			**65**

Indicates new course

Alamance Community College Biotechnology Program

Student Academic Progress/Advising Record

Student Name_____ ID#_____

Initial Advising Session Date _____ Code A45370

Course	Semester(s) Attempted	Semester Completed	Grade or TR	Course Substitution	Comments
DEVELOPMENTAL					
MAT 003- P2					
ENG 002- P2					
Biotech College Coursework					
BIO111					
BTC 181					
CHM 131/131A or CHM 151					
ENG111					
BIO 112					
BIO 275 or BTC 275					
BTC 281					
CHM 132 or CHM 152					
BIO 112					
BIO 275 or BTC 275					
MAT 152					
BIO 250					
BTC 285					
BIO / BTC / PTC Elective: BIO 140/140A or BIO 168 or BTC 150 or BTC 182 or PTC 110					
ENG 114 or ENG 112 or COM 110					

or COM 231					
BIO 250					
BTC 286					
BTC 287					
ELECTIVE					
ELECTIVE					
BTC 288 or WBL 112					
GPA					
Graduation App Complete					
Graduation Requirements Met					
Agricultural Biotech					
BIO 110 or BIO 111					
BTC 181					
CHM 131 and CHM 131A or CHM 151					
MAT 152					
BTC 250 or BTC 275					
ENG 111					
BTC 281					
CHM 132 or CHM 152					
BTC 150					
BTC 285					
AGR 170					
HOR 162					
HOR 164					
HFA Elective					
HOR 168					
HOR 134					
AGR 139					
ENG 115 or COM 231					
SBS ELECTIVE					
BTC 288 or WBL 112					
GPA					
Graduation app:					
Graduation Requirements Met:					

Biopharma Quality					
BIO 110					
BTC 181					
CHM 131 and CHM 131A					
MAT 110 or higher					
BTC 150					
ENG 114 or ENG 112 COM 110 COM 231					
BTC 182					
PTC 110					
PTC 222					
HFA ELECTIVE					
BTC 183					
PTC 120					
PTC 226					
SBS ELECTIVE					
BTC 288 or WBL 112					
GPA					
Graduation app:					
Graduation Requirements Met:					

Student Signature/ Date
Comments

_____

Instructor Signature/ Date

_____

Biotechnology Prerequisite/ Corequisite Table

General Education Courses	Prerequisite	Corequisite
BIO 111	MAT 003 P2 ENG 111	
BIO 112	BIO 111	
BIO 250	BIO112	
BIO 275	BIO111	
CHM 131	MAT 003 P2 ENG 111 P1	CHM 131A

CHM 131A		CHM 131
CHM 151	BTC 181 or MAT 003/071	
ENG 111	ENG 002	ENG 011
ENG 112 OR COM 231	ENG 002 P2	
Biotechnology Courses		
BTC 181		MAT 003
BTC 281	BTC 181	
BTC 285	BIO 111	
BTC 286	BIO 111	
BTC 287	BIO 250 or BTC 250	
BTC 288	BTC 181	

Revised FA24

Alamance Community College Biotechnology Program

Essential Functions and Technical Standards Requirements

Purpose Statement:
All students in the Biotechnology program are expected to meet certain essential functions/technical standards which are essential for successful completion of all phases of the program, and which reflect industry requirements and standards. The following technical standards represent the essential nonacademic requirements of the Biotechnology Program that a student must master to successfully participate in the program and become employable. To verify the students' ability to perform these essential functions, students may be required to demonstrate the technical standards/essential functions.

Meeting these technical standards does not guarantee employment in this field upon graduation. Ability to meet the program's technical standards does not guarantee a student's eligibility for any licensure, certification exam, or successful completion of the program.

Standard	Definition of Standard	Example(s) of Technical Standard
Critical Thinking/ Problem-Solving Skills	Gain the ability to measure, calculate, reason, analyze and synthesize, integrate and apply information as it pertains to a laboratory.	Read and comprehend relevant information in textbooks and scientific literature; identify problems related to laboratory results and determine appropriate course of action; apply safety precautions prior to use of chemicals and reagents; recognize errors and modify performance as needed; problem-solve unexpected observations or outcomes of laboratory procedures.
Interpersonal Skills	Ability to collaboratively work with all biotechnology students and program faculty in the classroom and student lab.	Interact appropriately with persons from a variety of social, emotional, cultural and intellectual backgrounds; employ basic conflict management skills.

		Demonstrate the ability to work independently maintaining composure and competence under stressful situations.
Communication Skills	Demonstrate effective written and oral communication or alternate methods in the primary language of the institution. This includes, but is not limited to, reading, following instructions, and other forms of communication.	Writing: The ability to communicate effectively in legible written form. Speaking: The ability to verbally communicate understandably in English. Reading: The ability to read, understand, and follow directions printed in English. Technology Use: Ability to use appropriate hardware and associated software, navigate Moodle and the internet, communicate via written emails, ability to maintain electronic records.
Mobility/Motor Skills	Possess manual dexterity and fine motor skills to perform safe and effective laboratory procedures.	Ability to manipulate small objects with fingertips or adaptive devices; bilateral use of hands or terminal devices that involves coordination and strength; ability to maneuver in the laboratory, around instruments, and in confined spaces. Movement includes utilizing shoulders, arms, and neck; bending; twisting the body; standing; reaching and grasping overhead, in front of the body, and down, prolonged standing or sitting.
Auditory Skills	Sufficient hearing to function in a laboratory setting.	Hearing: Demonstrate hearing ability with any type of auditory aid in order to follow verbal instructions; ability to hear alarms; ability to adapt (phone receivers, hearing aids, etc.)

Visual Skills	Sufficient vision to function in a laboratory setting.	Visual: The ability to distinguish red color from yellow color; distinguish clear from cloudy; and see through a microscope. Must be able to discern primary colors and/or shades thereof; and differentiate shapes macroscopically and microscopically.
Behavioral Skills	Behave in a safe and professional manner in regards to appropriate dress and action required for a laboratory setting. Biotechnology students should be tolerant of a variety of environmental stressors and time management skills.	Wearing safety or other required PPE and approved clothing at all times while working in the lab, regardless of the tasks being performed. Work safely with potentially infectious organisms, samples, and other hazardous materials. Follow specific regulatory guidelines in the laboratory. Remain focused and alert in a fast paced, highly stressful (sometimes unpredictable) work environment.

Alamance Community College is committed to providing equal educational opportunities for students with documented disabilities. Students who require disability services or reasonable accommodations must identify themselves as having a disability and provide current diagnostic documentation to the Accessibility Services Office located in the Main Building, Room 233. All information is confidential. Please contact the Disability Services Coordinator for more information at 336-506-4130 or email at disabilityservices@alamancecc.edu and notify your course instructor of your special needs, as appropriate. Students should initiate this process as soon as possible (prior to the start of classes and/or field experience)

Financial Aid

Alamance Community College offers scholarships, grants, and work-study programs that can help make your college education affordable.

Applying for Financial Aid

- ACC Financial Aid page

Apply for Admission to ACC

- Apply for admission here. If you have already applied, skip to the next step
- If you have applied to ACC within the past year, you do not need to complete another application.
- (Processing your aid will depend on your enrollment)

Complete the FAFSA

- Go to www.studentaid.gov and start your application.

Complete NC Residency Determination

Complete here

HS Transcripts (Official HS transcripts are required & we must verify HS completion before offering financial aid

Question? Contact Us.
Financial Aid Office
financialaid@alamancecc.edu
336-506-4340

Paying for ACC - Costs & Planning

- ACC Costs and Planning page
- The following courses require a lab fee to cover the cost of consumables and is included in the cost of the course:
    - BTC 181 $100
    - BTC 275 $100
    - BTC 281 $100
    - BTC 285 $100
    - BTC 286 $100
    - BTC 287 $100

Admissions

Alamance Community College Student Services Admission Policy 5.1.1

The College does not discriminate on the basis of race, color, religion, sex, gender, gender identity or expression, pregnancy, age, national origin, disability, political affiliation, genetic information, or military/veteran status in any of its activities or operations.

I. OPEN DOOR ADMISSIONS Except as otherwise specified herein, the College maintains an open-door admission policy to all applicants who are legal residents of the United States and who are high school graduates or are at least 18 years of age. The College shall not solicit or use information regarding the accreditation of a secondary school located in North Carolina that a person attended as a factor affecting admission to the College or to any program of study, loans, scholarships, or other educational activity at the College unless the accreditation was not conducted by a State agency. For purposes of this Policy, the term "accreditation" shall include certification or any other similar approval process. Student admission processing and placement determination shall be performed by College officials. Admission requirements for an emancipated minor shall be the same as for an applicant who is 18 years old or older. Non-emancipated minors may be admitted and allowed to attend the College pursuant to 1D SBCCC 200.95. The open-door policy does not mean there are no restrictions on admission into specific College programs. Students shall be admitted into specific College programs when they demonstrate aptitude for these programs as determined by personal interest, academic background, placement tests, and personal interviews. If an academic deficiency exists, applicants will be given an opportunity to remove the deficiency by taking preparatory work. For more specific information regarding certain admissions criteria, see Procedure 5.1.1.1.

II. ADMISSIONS DENIALS

A. Basis for Denials

1. Suspension/Expulsion from another Educational Entity. The College reserves the right to refuse admission to any applicant during any period of time that the applicant is under a period of suspension or expulsion from another educational entity for non-academic disciplinary reasons.

2. Safety Concern. The College reserves the right to refuse admission to any applicant if it is necessary to protect the safety of the applicant or other individuals. When making a safety determination, the College may refuse admission to an applicant when there is an articulable, imminent, and significant

threat to the applicant or other individuals. When refusing admission based on safety concerns, the President or designee shall document:

a. Detailed facts supporting the rationale for denying admission;
b. The time period within which the refusal to admit shall be applicable and the supporting rationale for the designated time period; and
c. The conditions upon which the applicant that is refused would be eligible to be admitted.

3. Residency for Distance Learning. The College is not authorized to provide distance learning courses outside of North Carolina unless state authorization has been granted from the state in which the applicant resides. State authorization requires colleges to seek and secure authorization to offer instruction in that state. Admission of applicants residing outside of North Carolina to an online degree, diploma, certificate program or individual online courses offered by the College is dependent on the College's ability to secure authorization from the applicant's state of residence. State authorization does not affect the cost of attending the College. Tuition requirements, including those for out-of-state students, still apply. This requirement does not apply to non-credit continuing education courses.

4. Undocumented Immigrants. An undocumented immigrant is any immigrant who is not lawfully present in the United States. The College shall not admit undocumented immigrants unless all of the following conditions apply:

a. The undocumented immigrant attended and graduated from a United States public high school, private high school, or home school that operates in compliance with State or local law.
b. The undocumented immigrant must comply with all federal and state laws concerning financial aid.
c. The individual shall not be considered a North Carolina resident for tuition purposes and must be charged out-of-state tuition regardless of whether the individual resides in North Carolina.
d. When considering whether to admit the individual into a specific program of study, the College shall take into account that federal law prohibits states from granting professional licenses to undocumented immigrants.
e. Students lawfully present in the United States shall have priority over any undocumented immigrant in any class or program of study when capacity limitations exist.
f. An admitted undocumented student will not be permitted to register for a class or program of study or be placed on a waiting list until the final period of registration for the term.

5. Readmission. The College reserves the right to refuse readmission to a former student who has unsettled financial obligations at the College; who has not complied with previous disciplinary requirements; who was dismissed for academic reasons; who was dismissed for articulable, imminent, and significant threats; or who is under a period of suspension or expulsion from another educational entity for non-academic disciplinary reasons.

6. Criminal Justice Education and Training. The College requires students enrolled in courses mandated under N.C.G.S. § 17C and 17E, the North Carolina Criminal Justice Education and Training Standards Commission, or the North Carolina Sheriffs' Education and Training Standards Commission to be sponsored by law enforcement agencies until completion of the program. The student must be sponsored by a law enforcement agency to be admitted into the program. Failure to have such sponsorship shall result in an admission denial.

7. Non-Criminal Justice Education and Training Firearm Courses. Except for courses governed by Criminal Justice Education and Training, if the College has a program that requires students to possess a firearm, prior to admission, the student must provide proof of eligibility to possess firearms. For purposes of this policy, “firearm” means a handgun, shotgun or rifle that expels a projectile by action of an explosion; “proof of eligibility” means i) a current, valid State-issued permit to purchase a firearm; ii) a current, valid State-issued concealed carry permit from North Carolina; iii) a current, valid State-issued concealed carry permit from a state with a reciprocal concealed carry agreement with North Carolina; iv) proof of an exemption from permit requirements pursuant to N.C.G.S. § 14- 415.25; or v) a background check to determine whether the applicant can lawfully possess a firearm in North Carolina pursuant to N.C.G.S. §§ 14- 269.8; -404(c); -415.1; -415.3; and -415.25.

8. Lack of Program Capacity. The College may deny admission based on lack of program capacity, upon recommendation of the Vice President of Instruction, consistent with academic requirements established by the College.

B. Appeal of Admissions Denials If an applicant is denied admission to the College for any of the reasons specified in Section II(A)(1)-(8), within five (5) calendar days following the receipt of the reasons specifying the denial, the applicant may file a written appeal with the Director of Enrollment Management for a reconsideration. The written appeal shall contain the applicant’s reasons why he or she should be admitted and shall include any supporting documentation. The Director of Enrollment Management shall also meet with the applicant and provide the applicant an opportunity to respond. Within 10 calendar days from receipt of the applicant’s written appeal, the Director of Enrollment Management shall make a determination and provide the applicant with a written response. If

the applicant does not agree with the Director of Enrollment Management's determination, within five (5) calendar days following the receipt of the Director of Enrollment Management's determination, the applicant may file a written appeal with the President. The President shall conduct an "on the record review" and shall make a determination within 10 calendar days after receipt of the applicant's written appeal. The President's decision is final.

Adopted: June 13, 2022 Legal Reference: 1D SBCCC 200.95 and 400.2; NC Community College Written Memoranda CC10-026 (issued 7/12/10) (This policy replaces "Denial of Admission for Suspension or Expulsion from Another Educational Entity," which moves to a procedure, adopted May 10, 2020; revised February 12, 2018. This policy also replaces "Nursing Program Admissions Requirement" adopted January 9. 2012; revised May 9, 2016. Nursing program admissions requirements will be posted in the College Catalog.)

Admission Requirements & Transfer Credit

To be admitted into the Biotechnology program, students must meet the general admission requirements as detailed in the ACC admissions procedures:

- Completed application submitted to ACC noting biotechnology as the curriculum choice.
- Submit high school transcript or GED scores unless they possess a college degree.
- Submit an official transcript of all post-secondary education. Transfer credit and advanced standing is awarded for general education courses and selected first-year biotechnology courses according to institutional and departmental policies and must meet the following criteria:
    - Course content and credit hours must parallel that required by the biotechnology curriculum.
    - Course grade must be C or better.
    - Transfer credit is based on the availability of descriptions of courses previously taken. Applicants are responsible for providing course descriptions upon request.
    - In special circumstances, credit by examination may be offered.
- Complete required placement tests or minimum SAT/ACT scores for English and math. These scores determine placement into college math and English courses and are prerequisites for general education courses.
- More information on the admissions process can be found here.
- To speak with someone in the department, for advising please contact the faculty listed on our departmental page.

Program Progression

- **Academic Policies/Guidelines can be found here.**

Grading System Policy

The College has a right to set academic standards that students must meet. Grades are based on quality of achievement of the objectives of the course being taken. The following system is used for recording student achievement:

Grade	Quality Points Per Credit Hour
A-Excellent	4
B-Good	3
C-Satisfactory	2
D-Lowest passing	1
F-Failure	0

The College operates on a quality point system. For each credit hour of work with a grade of A, B, C, D or F, a numerical value of 4, 3, 2, 1 or 0, respectively, is awarded. This number is multiplied by the number of credit hours for the course to determine the quality points earned.

A student's semester grade point average (GPA) is determined by dividing the total quality points earned in all courses by the total credit hours attempted (excluding I, R, TR, CE, P and AU grades). This grade point average (GPA) is a general measure of the quality of the student's work. Hours attempted and quality points earned in previous terms are included in the above procedures to determine the Cumulative Grade Point Average. All students must have a minimum cumulative GPA of 2.0 in the student's current program of study to graduate.

I - Incomplete

This indicates that a student has made significant and satisfactory progress in the course; however, due to unavoidable circumstances the student is not able to complete course requirements by the end of the semester. Since the "incomplete" extends enrollment in the course, requirements and deadlines for satisfactory completion will be established

through faculty/student consultation. The work for the “I” grade must be completed, and a grade assigned “A, B, C, D, F” no later than the end of the next semester/term, or the grade of “I” will automatically be changed to an “F.”

R - Re-enroll

A student who has been unable to meet the course objectives in the specified time must re-enroll to earn credit. This grade may only be given to students in noncredit developmental courses.

WP - Withdrew Passing

A student may withdraw up to the 80% point of the course and receive a WP. Instructors can withdraw a student during this time for excessive absences. The WP grade is not used to compute the student’s GPA. After the official drop date as published in the student calendar, students must complete the course and will be awarded the appropriate grade earned at the end of the semester.

P - Passed

This grade is awarded in corequisite noncredit developmental courses and in the work experience portion of work-based learning. It may also be awarded for other experiential learning courses such as supervised field studies or review courses. When a course is graded in this manner, it must be reflected in the master course plan, and the Registrar’s Office must be notified when the course is established. This grade signifies that the student has satisfactorily completed the course (equivalent to a C or better). Failure to complete the course graded in this manner may be indicated with any other appropriate grade as prescribed in the course plan. No grade points are awarded for hours completed in this manner, and the P grade is not used to compute the grade point average (GPA).

P1 - Passed Tier 1

This grade is awarded in transitional noncredit developmental mathematics and/or English courses. No grade points are awarded, and the grade is not used in the computation of the grade point average (GPA).

P2 - Passed Tier 2

This grade is awarded in transitional noncredit developmental mathematics and/or English courses. No grade points are awarded, and the grade is not used in the computation of the grade point average (GPA).

P3 - Passed Tier 3

This grade is awarded in transitional noncredit developmental mathematics and/or English courses. No grade points are awarded, and the grade is not used in the computation of the grade point average (GPA).

TR - Transfer

This signifies that credit for a course was accepted from another institution. No quality points are awarded, and the grade is not used in the computation of the GPA.

CE - Credit by Examination

This signifies that the student has met the course objectives as demonstrated by a proficiency examination. No quality points are awarded, and the grade is not used in the computation of the GPA.

AU - Audit

This signifies that the student has taken a course for no credit. No quality points are awarded, and the grade is not used in the computation of the GPA. The student who enrolls for a course cannot change from audit to credit or credit to audit after the official drop/add period. The North Carolina Community College System may enact temporary grades due to emergencies such as a pandemic. In such situations, the College will adopt such grades as necessary and in the best interest of students.

Alamance Community College Grade Appeal Policy 5.2.5 and Procedure 5.2.5.1

This policy shall apply to grade appeals unrelated to issues pertaining to academic dishonesty as outlined in Policy 5.3.2 – Student Code of Conduct. The grade appeal process applies only to course grades. In the event a student appeals a grade that prevents progression in a program, the student will be allowed to enroll and attend the following semester pending the outcome of the appeal, except clinical and work-based learning courses/experiences. If the grade is upheld, the student will be administratively dropped from the course and refunded the tuition. An appeal should be initiated within 30 days from the date the grade was issued and the appeal must be in writing. The steps a student should take are described in Procedure 5.2.5.1. An appeal to the Vice President of Instruction is the final step in the appeal process.

Grade Appeal Procedure 5.2.5.1
The grade appeal process is:

A. If a student is dissatisfied with a grade issued by an instructor, the student must first request to meet with the instructor who assigned the grade within five (5) business days

after official issue of that grade and submit the Grade Appeal Form. The instructor will make a written determination via the Grade Appeal Form and provide a copy to the student and Department Head. In cases where the student is unable to meet in person with the instructor, the student may contact the instructor by letter or email including the Grade Appeal Form in that communication. If the instructor is no longer employed at the College, the student may proceed to the next step.

B. If the student is dissatisfied with the instructor's determination, within five (5) business days thereafter, the student may appeal in writing using the Grade Appeal Form to the Department Head. The student must present the instructor's written determination. In cases where the student is unable to meet in person with the Department Head, the student may contact the Department Head by letter or email including the Grade Appeal Form in that communication. The Department Head will make a written determination and provide it to the student and appropriate Dean.

C. If the student is dissatisfied with the Department Head's determination, within five (5) business days thereafter, the student may appeal in writing using the Grade Appeal Form to the appropriate Dean. The student must present the Department Head's written determination. In cases where the student is unable to meet in person with the Dean, the student may contact the Dean by letter or email including the Grade Appeal Form in that communication. The Dean shall make a written determination and provide it to the student and Vice President of Instruction.

D. If the student is dissatisfied with the Dean's determination, within five (5) business days thereafter, the student may file a written appeal via the Grade Appeal Form with all documentary evidence to the Vice President of Instruction ("Vice President"). The Vice President shall perform an "on the record review" and will make a determination within 10 business days after receipt of the student's appeal. If needed for clarification, the Vice President may meet with the student or ask the student to submit additional information. The Vice President shall make a written determination and provide a copy of the decision to the student, instructor, Department Head, and appropriate Dean. The Vice President's decision is final.

Adopted: June 23, 2022

Grade Appeal Form

Alamance Community College Academic Progress Standards Policy 5.2.6

The College's minimum standards of academic progress are intended to ensure academic success and graduation. The standards provide advance notice to students and opportunities to improve by students who perform at or below the minimum grade point average (GPA) required for graduation.

The GPA used in these standards refers to the student's cumulative GPA in his or her current program of study.

Academic Progress Standards

A. A student who is making unsatisfactory academic progress will be placed on academic warning when his or her cumulative grade point average falls below 2.0 at the end of an academic term.

B. A student on academic warning is placed on academic probation when his or her cumulative GPA remains below 2.0 after completion of an academic warning semester.

C. If a student is on academic probation for two consecutive semesters, he or she will be placed on academic suspension for the next semester.

Adopted: June 13, 2022

Biotechnology Student Policies

Required Program Uniform

Students in biotechnology courses are required to wear a white laboratory coat with cuffs and ¾ length (to knees). Closed-toe shoes, and proper PPE while in the laboratory. A laboratory coat is available through the financial aid office, in the form of a voucher that can be used to purchase required uniforms at Uniform Destination in Tanger Outlets, Mebane, NC.

Laboratory Dress Code

The following dress code is required of all students in Biotechnology coursework:

- Lab coat (white, ¾ length with cuffs) - see Amazon for type
- Closed-toe shoes
- No jewelry except small earrings
- No acrylic nails/nails cut to reasonable length & kept clean
- Hair pulled back
- No offensive odors including heavy perfume, tobacco, or body odor
- No hats or head coverings (exceptions for cultural/religious reasons)
- Neat trimmed beards (men only)
- Undergarments should not be visible

Cell Phone/Electronic Device Usage

Usage of cell phones and other electronic devices is permitted only when related to coursework or access to class related materials. Cell phone use is not permitted for personal use; this includes making/receiving calls, talking, making/receiving text messages, using social media. If there is an emergency situation, the student must notify faculty to receive permission to leave the phone on silent mode during classroom/lab

time. The student must exit the classroom/lab to receive the call. Cell phone conversation during structured break time should be in a private area away from other students and instructors.
Students not adhering to these policies will be asked to leave the classroom/lab and counted absent.

Required Aseptic Technique Behavior and Use of the Aseptic Suite

The aseptic suite is to be utilized only by trained individuals with faculty or staff in the department; users must complete the CDC training on PPE for Clinical Labs and operation of a Biological Safety Cabinet prior to use. The user must also demonstrate the ability to don PPE properly prior to entering the laboratory. The user is not allowed to work in the facility alone, a faculty or staff member must be present. All biological waste from procedures must be placed in the proper disposal bin; liquid biological waste must go in the liquid waste vessel and the waste container must be sprayed with bleach or autoclaved, all plastics must go in the biological waste bins throughout the space. Absolutely no materials in contact with living cells or tissues can enter the trash without being decontaminated first. Your Biological Safety Cabinet must be clean of all spills, consumables and cultures, and must be wiped down with a sporicidal wipe after use. Once your procedure is complete in the aseptic suite, and all of your materials have been cleaned up and put away you must de-gown in the gowning space, and place your gowning supplies in a labeled bag with your name. Gowning supplies will be changed out weekly unless they are damaged or become contaminated. Gowning supplies cannot leave the gowning area upon departure.

Use of the aseptic suite will be monitored, any student or individual found intentionally disobeying the policy will be warned the first offense, asked to leave in the second offense, and prohibited from entering the space after the third offense.

Professional Competencies

The student will demonstrate personal and professional attributes of an entry-level life science professional. The following objectives reflect the personal and professional attributes expected of a graduate of the Alamance Community College Biotechnology Program:

I. Initiative

- Work independently to complete assigned tasks (self-starter)
- Seek additional responsibility
- Integrate knowledge from a variety of means to solve problems
- Recognize mistakes and take corrective action
- Demonstrate independent learning effort

II. Attitude
- Accept constructive criticism and demonstrate effort to improve
- Responsible for laboratory competence, seek input on performance

III. Dependability/Reliability
- Demonstrate efficiency by completing tasks within expected time frame
- Work effectively under pressure and during emergencies
- Report to affiliate/school on time
- Recognize limitations and seek assistance

IV. Teamwork Skills
- Work as team member, cooperate with others
- Show initiative and/or cooperation to maintain work flow
- Ready and willing to provide back-up for others when necessary
- Exercise good judgment in non-routine situations

V. Communication Skills
- Communicate effectively (orally and in writing) with co-workers, superiors, subordinates, patients, and the public
- Communicate test results, normal ranges, and specimen requirements
- Answer inquiries about test results, methods, specificity and sensitivity; answer questions about specific factors that can influence test results

VI. Critical Thinking Skills
- Recognize results that are abnormal or that deviate from those expected
- Confirm abnormal results
- Recognize equipment malfunction
- Analyze quality control data, make judgments concerning the results, and take appropriate actions to maintain accuracy and precision
- Take appropriate action within prescribed guidelines using available resources
- Evaluate and solve problems related to specimen collection and processing

VII. Professional Skills
- Exhibit ethical behavior and maintain confidentiality
- Understand that the laboratory can be a high risk environment
- Seek assistance or clarification when needed; accept constructive criticism
- Adhere to federal and state laws, regulations, and guidelines (labor laws, OSHA, FDA, EPA)
- Adapt to changes in practice, accepting and implementing approved changes and learning new tasks

- Take responsibility for own career development, seeking out and participating in appropriate continuing education and professional development
- Manage stress and resolve conflicts in a fair manner

Departmental Code of Conduct Violations

The behaviors described below are violations to the departmental code of conduct.

Academic Dishonesty

Theft of, misuse of, or damage to college property, property of a member of the college community, to include clinical facilities, or campus visitors.
Possession of or use of alcoholic beverages, being in a state of intoxication on college campus or supervised functions off campus, to include clinical facilities; possession, use, or distribution of any illegal drugs on college campus or supervised function off campus, to include clinical facilities.

Lewd or indecent conduct

Mental, physical, and/or sexual abuse of any person on college premises or at college sponsored/supervised functions, to include clinical.
Any act, comment, behavior that is perceived to be of a sexually suggestive or harassing nature creating an intimidating, hostile or offensive environment.
Intentional obstruction or disruption of teaching.
Smoking (including electronic forms, i.e. vaping).
Inappropriate texting, emailing, and/or using electronic devices during class except for appropriate classroom use, i.e. taking notes, class activity. Phones are to be kept on silent or vibrate.

Departmental dress code and personal hygiene for class and/or laboratory.
Practices outside the identified Scope of Practice.
Violates the Code of Ethics of the Profession.
Violates GLP standards required for the profession.
Lacks theoretical knowledge in the laboratory setting to provide a safe environment.
Disregards student health policies.
Communicating Threats – verbally, in writing, through a third party, or by any other means.
Normal Classroom Behavior – Students shall not cause disruption in the classroom or be disrespectful to classmates or the instructor.

Disciplinary actions are as follows:

First Offense- Documentation in student file and Watermark. Dismissal from class/clinical that results in class/clinical absence and unsatisfactory clinical grade. Notify the Program Department Head, Dean, and Vice-President of Student Services.
Second Offense- Immediate referral to Vice-President of Student Services with adherence to any recommendations presented by the Vice-President of Student Services, and notify the Program Department Chair and Dean.
Third Offense- Immediate dismissal from the program and notify the Department Chair and Dean.

Alamance Community College Biotechnology Program

Course Student Learning Outcomes

Expected Competencies Met Within Each Course

Course	Competency
BTC 181	● Competency: Analyze problems and make logical decisions to safely execute lab protocols as prescribed. ● Competency: Perform calculations required to prepare buffer solutions. ● Competency: Discriminate when to use and demonstrate proper use of basic laboratory equipment. ● Competency: Perform a biological assay and successfully plot data in a chart. ● Competency: Identify the purpose of GMP and GLP and how they contribute to quality in industry standards. ● Competency: Implement the use of documentation by developing and maintaining an electronic laboratory notebook (ELN).
BTC 281	● Competency: Perform the processes of scaling up and maintaining cultures of genetically modified bacteria for use in protein production. ● Competency: Purify recombinant protein using various techniques such as; filtration, centrifugation, electrophoresis, and column chromatography.

	● Competency: Demonstrate understanding of the importance of quality control and give specific examples. ● Competency: Demonstrate ability to calibrate, use, and follow instrument SOPs. ● Competency: Demonstrate the ability to utilize records in a manufacturing environment. ● Competency: Understand cGMP federal regulations and how they relate to biomanufacturing. ● Competency: Understand the upstream and downstream components in biomanufacturing.
BTC 285	● Competency: Demonstrate ability to maintain cell lines of various organisms for two consecutive weeks without contamination. ● Competency: Understand specialized techniques used to manipulate cells in culture, while improving overall growth and production. ● Competency: Mastering of aseptic technique and use of a biological safety cabinet (BSC). ● Competency: Demonstrate knowledge of basic cell culture technique, utilizing protozoan culture, plant tissue culture and mammalian cell culture.
BTC 286	● Competency: Describe in overview, the functional immune system ● Competency: Demonstrate

	detailed understanding of innate vs. specific immunity, antigen recognition by the immune system, cell mediated immunity, humoral immunity ● Competency: Identify the cells and their functions involved within innate and acquired immunity ● Competency: Understand antibody structure & antigen-antibody interaction ● Competency: Present the functions and subsets of T cells, their components and cell physiology ● Competency: Demonstrate the ability to describe the B cell function and interaction ● Competency: Describe autoimmune disorders, tolerance and hypersensitivities ● Competency: Know the terminology associated with the field of immunology ● Competency: Lab Competencies:1. Identification of various blood cell types 2. Blood typing and the hemagglutination assay 3. Performance of a complement (C') fixation assay 4. Preparation of an immunodiffusion - Ouchterlony Test 5. Radial Immunodiffusion Assay (RIA) 6. Execution of an Enzyme-Linked ImmunoSorbent Assay (ELISA) 7. ELISA detection of either specific Ab or specific Ag 8. Growth of Hybridoma cells 9. Isolation of monoclonal antibodies (mAb)

	from culture 10. Immunoelectrophoresis (PAGE) 11. Western Blot 12. Analysis of mAb with various assays.
BTC 287	● Competency: Demonstrate ability to follow complex protocols. ● Competency: Demonstrate ability to maintain a long term project over multiple lab sessions. ● Competency: Be able to carry out multiple activities within the same lab period. ● Competency: Improve current and add new lab skills through repetitive execution. ● Competency: Perform analysis and presentation of data. ● Competency: Gain experience in the performance of several widely used molecular biology protocols including cloning and ligation, PCR, CRISPR/Cas-9, and DNA sequencing. ● Competency: Learn the importance and methods of properly documenting all work, modifications to protocols and collection of results. ● Competency: Demonstrate the appreciation of documentation through the keeping of properly maintained electronic lab notebook.
BTC 288	● Competency: Demonstrate the knowledge, skills and abilities required for working in a

	biotechnology laboratory. ● Competency: Demonstrate the ability to follow a procedure or protocol independently. ● Competency: Successfully maintain a legal laboratory notebook of all procedures and protocols completed throughout the semester. ● Competency: Successfully submit a written paper in journal article format, along with a presentation of the comprehensive project. ● Competency: Create a project plan, meet project benchmarks and evaluate project delivery.

Appendix

- Essential Function/Technical Standards Verification Form
- Student Acknowledgement Statement
- Laboratory Safety Agreement Form

Essential Functions and Technical Standards Acknowledgement Form

The list of Technical Standards has been prepared to assist you in understanding the essential physical and behavioral requirements for participating in and successfully completing this program. These standards must be satisfied by all students in all aspects of the program, with or without a reasonable accommodation, including in the classroom, laboratories, clinicals and externships. Please note that you must carefully review these technical standards. If you are an individual with a documented disability who seeks reasonable accommodation, please contact Accessibility Services, Main Building, Room 233, 336-506-4130 or email at disabilityservices@alamancecc.edu , as soon as practical, for information concerning the College's accommodation process. Your signature below shall confirm and verify that you have reviewed the program's Technical Standards and are capable of performing those Standards, with or without a reasonable accommodation. Failure to perform the program's essential technical standards shall result in a student's removal from the program.

1._____
Print your full name

2._____
Sign your full name

3. _____
Student ID number

4._____
Date of signature

*If you are not 18 or older, please speak with your instructor. Your parent or guardian will have to sign below to consent to your ability to participate successfully.

I, (print your name) _____ give

my permission for (print student's name)

_____ to participate in the (enter course

prefix/number/name) _____ course.

Signed _____ Date _____

Alamance Community College
Biotechnology Program

Student Acknowledgement Statement

I _____ (print name) have received, read, and understand the policies of the biotechnology program at Alamance Community College. I have had an opportunity to ask questions and I agree to abide by the policies as set forth.

_____ _____
Student signature Date

_____ _____
Faculty signature Date

*If you are not 18 or older, please speak with your instructor. Your parent or guardian will have to sign below to consent to your participation in coursework.

I, (print your name) _____ give

my permission for (print student's name)

_____ to participate in the (enter course

prefix/number/name) _____ course.

Signed _____ Date _____