K-12:

**BRITE Futures:** BRITE Futures is dedicated to collaborating with K-12 teachers and administrators to foster North Carolina students' understanding of biotechnology concepts and skills. The mission is to share research and resources with the university community, public education and other partners, in ways that contribute to BRITE’s leadership in K-12 biotechnology education. They provide tours of research labs, hands-on activities with professional lab grade equipment, and biotech summer camps.

[http://www.nccu.edu/brite/outreach.cfm](http://www.nccu.edu/brite/outreach.cfm)

**STEM in the Park:** For students, focusing on underrepresented minorities, girls, and students from low-income backgrounds, they facilitate hands-on mentoring and engagement opportunities with STEM professionals. For educators, they provide half day immersion trips to experience STEM in real-life inside STEM companies around the Triangle region.


**Young Women in Bio (YWIB):** Young Women in Bio (YWIB) is a nationwide, nonprofit, volunteer organization that encourages young girls to explore opportunities, education, and careers in STEM. YWIB is affiliated with Women in Bio. YWIB RTP holds events for young women that introduce them to a range of STEM careers and experiences. YWIB RTP has capitalized on the many academic institutions and local biotech companies in the area to share and discuss a wide array of STEM fields with our student attendees.


**North Carolina Science Festival:** The North Carolina Science Festival is a month long celebration of science every April. Each year there are hundreds of events focused on fun, interactive science learning opportunities. An initiative of Morehead Planetarium and Science Center, the Festival highlights the educational, cultural and financial impact of science in this state. Through hands-on activities, science talks, lab tours, nature experiences, expos, exhibits and performances, the Festival engages a wide range of public audiences while inspiring future generations.

[https://www.ncsciencefestival.org/](https://www.ncsciencefestival.org/)

**North Carolina Association for Biomedical Research (NCABR):** provides free training and materials to K–12 educators by bringing them into research facilities to learn directly from scientists through their Rx for Science Literacy free workshop series. They also offer online courses, curricula and other publications about research and present outreach programs for the general public, including K–12 students.

[https://www.ncabr.org/](https://www.ncabr.org/)
**Biogen’s Community Lab:** is a state-of-the-art laboratory classroom where local middle and high school students engage in hands-on biotechnology experiments and interact with scientists and other biotech professionals. It offers free daylong, interactive science activities, rigorous summer programs, and teacher professional development.


**BioNetwork:** provides outreach programs including classroom visits, faculty training workshops, and career fairs that help connect bioscience industry skills with K12 and community college STEM education.

https://www.ncbionetwork.org/educational-resources/activities

**Scientific Research and Education Network (SciREN):** aims to connect local STEM researchers and educators to foster the dissemination of current research and ultimately enhance the science literacy of today’s youth through annual networking events and lesson plan workshops.

https://sciren.org/about-sciren/

**Higher Education:**

**Continuing Education Courses:**

**Advanced Biomanufacturing Training Program:** this course is the next in succession to BioWork and offers three certifications including advanced bioprocessing, aseptic training, and process technician for the state exam.

Offered at:
Johnston Community College

http://www.johnstoncc.edu/programs/industrial/bioprocess-tech/biowork.aspx

**BioNetwork:** delivers self-support short courses, workshops, and company-specific skill development in biomanufacturing, pharmaceuticals, food, beverage, and natural products. Courses can be delivered onsite, online, or at one of four lab facilities across the state.

https://www.ncbionetwork.org/course-catalog
**BioWork Certificate Program:** A 136-hour continuing education course offered at multiple community college throughout the state that provides skills and knowledge needed for entry-level process technicians in bioprocessing, pharmaceuticals, and chemical manufacturing.

Offered at:
Durham Technical Community College
Johnston County Community College
Piedmont Community College
Vance Granville Community College
Wake Technical Community College
Wilson Community College
Capstone Center in Raleigh (BTEC Building)

https://www.ncbionetwork.org/brochures/biowork

**Biomanufacturing Training and Education Center (BTEC):** Offers a Professional Certificate in Biomanufacturing science. Enhances expertise by completing three courses focused on the upstream, downstream, and analytical technologies common to biomanufacturing.

https://www.btec.ncsu.edu/industry/certificate.php

**Pharmaceutical Services Network:** a one-of-a-kind collaboration that provides a continuum of pharmaceutical education and training to new and existing companies in North Carolina. Services were developed with significant industry input and can be customized to accommodate specific company needs.

Offered at:
East Carolina University
Pitt Community College

https://www.ncpsn.com/

**Associate’s Degree Programs:**

**Biomedical Equipment Technology:** This course of study prepares students to use basic engineering principles and technical skills to install, operate, troubleshoot, and repair sophisticated devices and instrumentation used in the health care delivery system. Includes instruction in instrument calibration, design and installation testing, system safety and maintenance procedures, procurement and installation procedures, and report preparation.

Offered at:
Caldwell Community College and Technical Institute
Central Piedmont Community College
Durham Technical Community College
**Biopharmaceutical Technology:** The Biopharmaceutical Technology curriculum is designed to prepare individuals for employment in pharmaceutical manufacturing and related industries. Major emphasis is placed on manufacturing processes and quality assurance procedures. Course work includes general education, computer applications, biology, chemistry, industrial safety, and an extensive array of very detailed pharmaceutically specific classes.

Offered at:
Wake Technical Community College

[https://www.ncbionetwork.org/curriculum-programs/biopharmaceutical-technology](https://www.ncbionetwork.org/curriculum-programs/biopharmaceutical-technology)

**Bioprocess Technology:** The Bioprocess Technology curriculum is designed to prepare individuals to work as Process Operators in biological products manufacturing facilities. Students will combine basic science and communication skills, manufacturing technologies, and good manufacturing practices in the course of the study.

Offered at:
Johnston Community College
Vance-Granville Community College

[https://www.ncbionetwork.org/curriculum-programs/bioprocess-technology](https://www.ncbionetwork.org/curriculum-programs/bioprocess-technology)

**Biotechnology:** The Biotechnology curriculum, which has emerged from molecular biology and chemical engineering, is designed to meet the increasing demands for skilled laboratory technicians in various fields of biological and chemical technology. Course work emphasizes biology, chemistry, mathematics, and technical communications. The curriculum objectives are designed to prepare graduates to serve in three distinct capacities: research assistant to a biologist or chemist, laboratory technician/instrumentation technician, and quality control/quality assurance technician.

Offered at:
Alamance Community College
Brunswick Community College
Carteret Community College
Cleveland Community College
Craven Community College
Edgecombe Community College
Forsyth Technical Community College
Gaston College

[https://www.ncbionetwork.org/curriculum-programs/biomedical-equipment-technology](https://www.ncbionetwork.org/curriculum-programs/biomedical-equipment-technology)
Central Sterile Processing: The Central Sterile Processing curriculum is designed to prepare individuals for the field of Sterile Processing and Central Service Supply. Students will develop skills necessary to properly disinfect, prepare, process, store, and issue both sterile and nonsterile supplies, instrumentation, and equipment for patient care. Additionally, students will learn to operate sterilizing units and monitor effectiveness of the sterilization process.

Offered at:
Davidson County Community College
Fayetteville Technical Community College

https://www.ncbionetwork.org/curriculum-programs/central-sterile-processing

Chemical Technology: The Chemical Technology curriculum prepares individuals for work as analytical technicians in chemical laboratories associated with chemical production, environmental concerns, pharmaceuticals, or general analysis. Course work includes general chemistry, organic chemistry, introductory chemical engineering, qualitative analysis, and quantitative analysis, including such instrumental techniques as spectroscopy (UV-Vis, IR, AA) and chromatography (GC, LC). Students also utilize computerized data collection, reduction, and graphic presentation.

Offered at:
Cape Fear Community College

https://www.ncbionetwork.org/curriculum-programs/chemical-technology

Clinical Trials Research Associate: The Clinical Trials Research Associate curriculum prepares individuals to assist physicians and clinical researchers in the initiation, administration, coordination, and management of clinical research studies for the development of new drugs, clinical products, and treatment regimens. Course work includes in-depth study of drug development, Federal regulations, and clinical research processes. Supervised fieldwork provides skill application in subject recruitment, regulatory compliance, accountability for drugs/devices, and documentation of subject involvement in clinical research studies.
Environmental Engineering Technology: This course of study prepares students to use mathematical and scientific principles to modify, test, and operate equipment and devices used in the prevention, control and remediation of environmental problems and development of environmental remediation devices. Includes instruction in environmental safety principles, environmental standards, testing and sampling procedures, laboratory techniques, instrumentation calibration, safety and protection procedures, equipment maintenance, and report preparation.

Offered at:
Asheville-Buncombe Technical Community College

https://www.ncbionetwork.org/curriculum-programs/environmental-engineering-technology

Facility Maintenance Technology: The Facility Maintenance Technology curriculum prepares individuals to repair and maintain electrical and mechanical systems and physical structures of commercial and industrial institutions. Emphasis is on multi-disciplined systems maintenance, troubleshooting, and problem resolution. Course work includes carpentry, interior and exterior finishes, plumbing, electrical, masonry, air conditioning, heating, welding, machining, blueprint reading, building codes, and OSHA regulations, as well as computer applications.

Offered at:
Cleveland Community College
Wake Technical Community College

https://www.ncbionetwork.org/curriculum-programs/facility-maintenance-technology

Industrial Engineering Technology: The Industrial Engineering Technology curriculum is designed to prepare students through the study and application of the principles for developing, implementing and improving integrated systems involving people, materials, equipment and information as leaders in an industrial or manufacturing setting. Course work includes mathematics, systems analysis, leadership and management skills, quality and productivity improvement methods, cost analysis, facilities planning, manufacturing materials and processes, and computerized production methods.

Offered at:
Rowan-Cabarrus Community College
Wake Technical Community College

https://www.ncbionetwork.org/curriculum-programs/industrial-engineering-technology
**Industrial Management Technology:** The Industrial Management Technology curriculum is designed to prepare students through the study and application of the principles for developing, implementing and improving integrated systems involving people, materials, equipment and information as leaders in an industrial or manufacturing setting. Course work includes mathematics, systems analysis, leadership and management skills, quality and productivity improvement methods, cost analysis, facilities planning, manufacturing materials and processes, and computerized production methods.

Offered at:
Pitt Community College

https://www.ncbionetwork.org/curriculum-programs/industrial-management-technology

**Industrial Systems Technology:** The Industrial Systems Technology curriculum is designed to prepare or upgrade individuals to safely service, maintain, repair, or install equipment. Instruction includes theory and skill training needed for inspecting, testing, troubleshooting, and diagnosing industrial systems. Students will learn multi-craft technical skills in print reading, mechanical systems maintenance, electricity, hydraulics/pneumatics, welding, machining or fabrication, and includes various diagnostic and repair procedures.

Offered at:
Alamance Community College
Asheville-Buncombe Technical Community College
Bladen Community College
Caldwell Community College and Technical Institute
Cape Fear Community College
Catawba Valley Community College
Central Carolina Community College
Cleveland Community College
Craven Community College
Durham Technical Community College
Edgecombe Community College
Fayetteville Technical Community College
Forsyth Technical Community College
Gaston College
Halifax Community College
Haywood Community College
Isothermal Community College
Johnston Community College
Lenoir Community College
Martin Community College
McDowell Technical Community College
Montgomery Community College
Nash Community College
Piedmont Community College
Pitt Community College
Laser and Photonics Technology: This course of study prepares the students to apply basic engineering principles and technical skills for specifying, operating, and maintaining laser-based systems. Includes instruction in mathematics, science, communications, electronics, and optics courses emphasizing laboratory learning experiences that develops the hands-on skills needed. Graduates of the curriculum qualify for current and emerging employment opportunities in fiber optic communications, materials processing, laser surgery, research, and a variety of related fields.

Offered by:
Central Carolina Community College


Manufacturing Technology: This course of study that prepares students to use basic engineering principles and technical skills to identify and resolve production problems in the manufacture of products. Includes instruction in machine operations and CNC principles, production line operations, instrumentation, computer-aided manufacturing (CAM) and other computerized production techniques, manufacturing planning, quality control, quality assurance and informational infrastructure.

Offered by:
Craven Community College
Edgecombe Community College
Gaston College
Isothermal Community College
Randolph Community College

https://www.ncbionetwork.org/curriculum-programs/manufacturing-technology

Mechanical Engineering Technology: This course of study prepares the students to use basic engineering principles and technical skills to design, develop, test, and troubleshoot projects involving
mechanical systems. Includes instruction in principles of mechanics, applications to specific engineering systems, design testing procedures, prototype and operational testing and inspection procedures, manufacturing system-testing procedures, test equipment operation and maintenance, computer applications, critical thinking, planning and problem solving, and oral and written communications.

Offered by:
Asheville-Buncombe Technical Community College
Beaufort County Community College
Blue Ridge Community College
Caldwell Community College and Technical Institute
Cape Fear Community College
Catawba Valley Community College
Central Piedmont Community College
Forsyth Technical Community College
Gaston College
Guilford Technical Community College
Isothermal Community College
Lenoir Community College
Mitchell Community College
Pitt Community College
Richmond Community College
Rowan-Cabarrus Community College
South Piedmont Community College
Wake Technical Community College
Wayne Community College
Western Piedmont Community College

https://www.ncbionetwork.org/curriculum-programs/mechanical-engineering-technology

**Mechatronics Engineering Technology:** This course of study prepares the students to use basic engineering principles and technical skills in developing and testing automated, servomechanical, and other electromechanical systems. Includes instruction in prototype testing, manufacturing and operational testing, systems analysis and maintenance procedures.

Offered by:
Alamance Community College
Blue Ridge Community College
Cape Fear Community College
Catawba Valley Community College
Central Piedmont Community College
Craven Community College
Gaston College
Guilford Technical Community College
Mitchell Community College
Piedmont Community College
Medical Product Safety and Pharmacovigilance: The Medical Product Safety and Pharmacovigilance curriculum prepares individuals to work with pharmaceutical, biologic, and medical device companies to monitor, track, and report product safety data during ongoing clinical trials, as well as after a product has been approved and marketed. Course work includes in-depth study of federal regulations, components of a safety monitoring program, and procedures for reporting safety data. Supervised fieldwork focuses on reviewing adverse reports, writing safety case narratives, and creating safety reports in accordance with U.S. and international regulations.

Offered by:
Durham Technical Community College

Nanotechnology: The Nanotechnology curriculum prepares students to characterize and fabricate materials for biological, textile, chemical, and electrical applications at the atomic level in entry-level positions in engineering, manufacturing and/or medical research and development. Course work includes biology, chemistry, physics, mathematics, manufacturing engineering technology, and an extensive array of very detailed nanotechnology-specific courses, using high-tech equipment and complying with high-precision quality control and clean-room protocols.

Offered by:
Forsyth Technical Community College

Bachelor’s Degree Programs:

Biomanufacturing Training and Education Center (BTEC): BTEC undergraduate programs include (1) a Minor in Biomanufacturing degree which is transcript recognized and (2) an Undergraduate Certificate
which is not transcript recognized. Students from a wide variety of majors take BTEC courses in order to gain hands-on experience in a simulated-cGMP* environment to prepare them for rapidly growing fields in biomanufacturing. Students gain hands-on experience using industry-standard equipment along with a comprehensive education in the principles and theory of bioprocessing and biomanufacturing. The program home is the 82,500-gross-square-foot, $50-million Golden LEAF Biomanufacturing Training and Education Center (BTEC). This one-of-a-kind facility features a simulated-cGMP* pilot plant capable of producing biopharmaceutical products and packaging them in a sterile environment, in addition to laboratories with bench- and intermediate-scale bioprocessing equipment.

https://www.btec.ncsu.edu/academic/undergraduate/index.php

**Biomanufacturing Research Institute and Technology Enterprise (BRITE):** Undergraduates who complete the BRITE program earn a B.S. in Pharmaceutical Sciences, with a concentration in bioanalytical chemistry, protein separation sciences or molecular cloning. The curriculum in this four-year program has been meticulously developed by our highly credentialed faculty (nearly 100% of whom have industry experience) and biotechnology experts, including representatives from Biogen Idec, Merck, GlaxoSmithKline, Bayer Corporation, and Novozymes.

http://www.nccu.edu/brite/undergraduate.cfm

**Campbell University:** Students who earn a Bachelor of Science in pharmaceutical sciences (BSPS) are prepared to enter research and technical positions in the pharmaceutical and biotechnology industries.

https://cphs.campbell.edu/academic-programs/pharmaceutical-sciences/bs-in-pharmaceutical-science/

**University of North Carolina (UNC) & North Carolina State University (NCSU) joint department of Biomedical Engineering:** offers an ABET accredited B.S. in Biomedical and Health Sciences Engineering (BMHE). Once admitted to the Joint Department at UNC-Chapel Hill and NC State University, students in our program become enrolled at both institutions and graduate with a joint degree from both institutions.

https://www.bme.unc.edu/

**Winston Salem State University:** The program in biotechnology prepares graduates for entry-level positions in drug discovery and development sciences, advanced biotechnology laboratory methodologies, and regulatory and managerial policies related to the approval process for new chemical entities and devices. Graduates will be sought after for positions in bio-manufacturing, environmental remediation, food sciences, and biopharmaceutical sectors of the biotechnology industry.

http://catalog.wssu.edu/preview_program.php?catoid=8&poid=441&returnto=268
Graduate Degree Programs:

Biomanufacturing Training and Education Center (BTEC): The Golden LEAF Biomanufacturing Training and Education Center (BTEC) offers two graduate degrees: a Master of Science (MS) in Biomanufacturing and a Master of Biomanufacturing (MR). Both are Professional Science Master’s (PSM) degrees, which provide advanced education and training in a specific discipline while simultaneously developing business skills highly valued by employers. The Master of Science in Biomanufacturing is a research-based degree that requires a written thesis in addition to completion of advanced hands-on courses in BTEC's simulated cGMP facility. The Master of Biomanufacturing curriculum combines BTEC's advanced biomanufacturing courses with an increased focus on bioscience-focused MBA courses; a thesis is not required. Both degrees offer students the choice of upstream (fermentation) or downstream (purification) concentrations to accompany courses in global regulatory affairs, protein characterization techniques, case studies in cGMP manufacturing of influenza vaccine, case studies in monoclonal antibody production, advanced biomanufacturing and biocatalysis, and an industry internship. Both degrees also include professional skills training in effective oral, electronic, and written communications for both technical and business careers.

https://www.btec.ncsu.edu/academic/graduate/index.php

Biomanufacturing Research Institute and Technology Enterprise (BRITE): Students who complete the graduate studies program leave NCCU with an M.S. in Drug Discovery or Biomanufacturing. The program, which places an emphasis on lab research, provides a solid foundation for those who plan to continue their education at the doctoral level. The development of a Ph.D. program is currently underway. The curriculum in this four-year program has been meticulously developed by our highly credentialed faculty (nearly 100% of whom have industry experience) and biotechnology experts, including representatives from Biogen Idec, Merck, GlaxoSmithKline, Bayer Corporation, and Novozymes.

http://www.nccu.edu/brite/graduate.cfm

Campbell University: Students pursuing a MS in Pharmaceutical Sciences complete one of four specialized tracks in bioprocessing & biotechnology, industrial pharmacy/pharmaceutics, pharmaceutical analysis, or pharmacology. Additionally, The Department of Pharmaceutical Sciences provides an option for students to earn both their Bachelor of Science and Master of Science in Pharmaceutical Sciences degrees. Traditionally, earning both degrees would take a total of six years. With the 3+2 degree option, students are on a fast track toward completing both degrees in five years. Finally, they offer a dual PharmD/MS in Pharmaceutical Sciences that can be completed in five years.

https://cphs.campbell.edu/academic-programs/pharmaceutical-sciences/
**Duke University**: The Biomedical Engineering program offers several Master’s Degree programs and a PhD program. Students can complete a Master of Science (MS), a Master of Engineering (MEng), a Dual MS-MEng degree, or a PhD in Biomedical Engineering.

[https://bme.duke.edu/grad](https://bme.duke.edu/grad)

**North Carolina State University (NCSU)**: The Master of Microbial Biotechnology (MMB) program at NC State University is a unique blend of science and business education with practical training in the biotechnology industry. We prepare students to become successful professionals in the bioscience industry.

[https://harvest.cals.ncsu.edu/master-of-microbial-biotechnology/](https://harvest.cals.ncsu.edu/master-of-microbial-biotechnology/)

**University of North Carolina (UNC) & North Carolina State University (NCSU) joint department of Biomedical Engineering**: offers a Master’s of Science degree in Biomedical Engineering, a PhD in Biomedical Engineering and two graduate certificates in biomedical imaging and nanobiotechnology.

[https://www.bme.unc.edu/](https://www.bme.unc.edu/)