

# FROM CLASSROOM TO CLEANROOM: PREPARING ALABAMA'S BIOTECHNOLOGY WORKFORCE



For more information, visit [economicdevelopment.accs.edu](http://economicdevelopment.accs.edu)





The Alabama Community College System is ideally situated to cultivate talent across diverse industry sectors. By utilizing a variety of enrollment options including dual enrollment, non-credit courses, short certificates, associate degrees, apprenticeships, and other work-based learning models — community colleges are aligning talent development with the demands of industry.



24  
Colleges



182,000+  
Individuals served  
in AY2025



130  
Locations



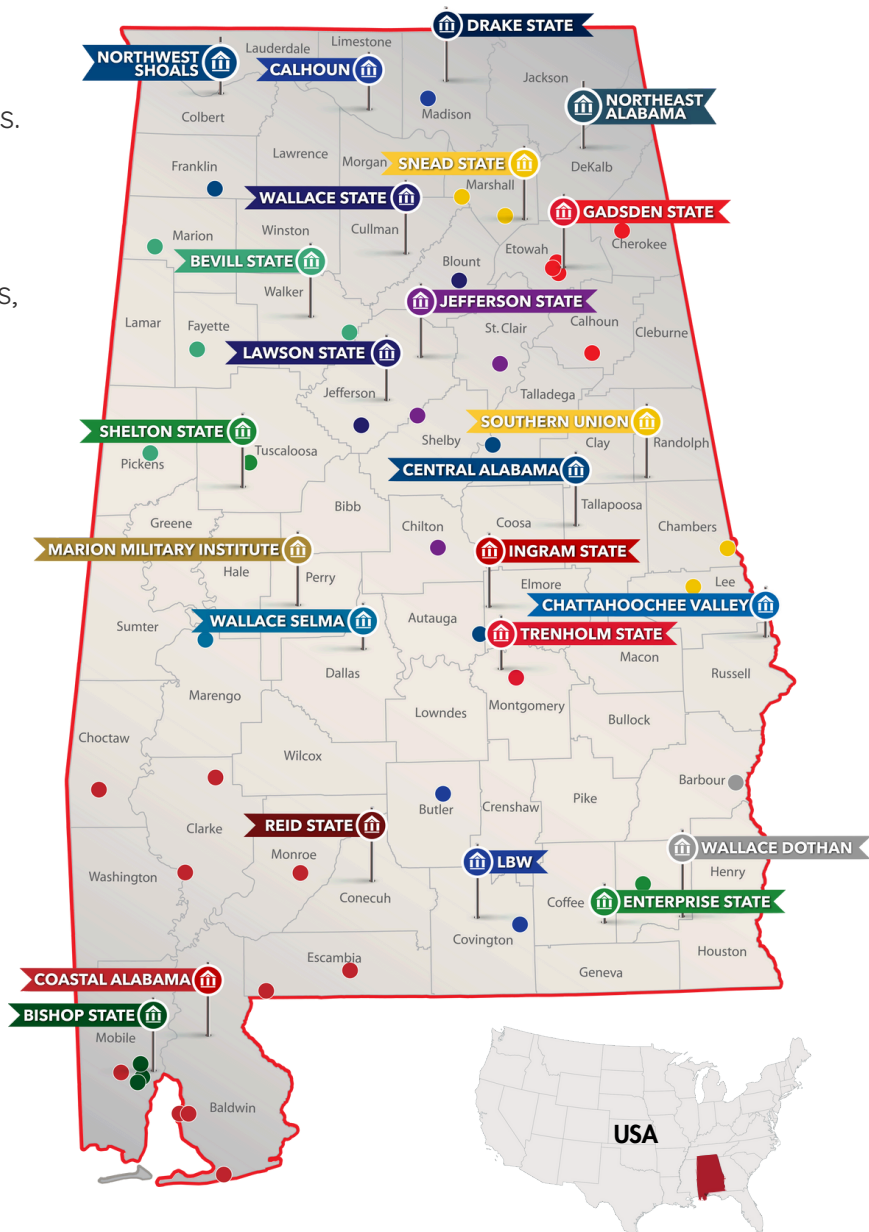
400+ Degree  
& Certificate\*  
Programs  
\*Credit & Non-Credit



500+  
Work-based  
Learning  
Company  
Partners



20% increase in  
for-credit enrollment  
since AY2022



## Cultivating a Biotech Workforce

As evidenced throughout this brochure, public and private sector organizations across Alabama are focused on expanding the state's biotechnology industry by developing a strong pipeline of skilled biotech talent. The Alabama Community College System is supportive of these efforts and expands upon them by prioritizing hands-on, industry-aligned training and internships designed to create clear pathways into biotech careers..



Photo credit: HudsonAlpha

The ACCS **Skills for Success Biotechnician** course provides essential, industry-aligned training for individuals pursuing careers in biotechnology. Participants gain a solid foundation in modern biotech methods, regulatory oversight, biopharmaceutical development, laboratory and manufacturing best practices, documentation standards, workplace safety, environmental monitoring, and professional ethics. Completers leave prepared for a range of entry-level roles across biotech labs, clinical settings, and manufacturing environments.

## THEORY MODULES



### MODULE 1

General topics in Biotechnology; Understanding Regulatory Bodies; Rules in Labs & Cleanrooms; Important Documents in Biotechnology; Jobs and Opportunities in Biotechnology



### MODULE 2

Technical Skills and Applications; Sterilization vs. Decontamination vs. Disinfection; Calibrating and Qualifying Equipment; Scientific Notation and Significant Figures



### MODULE 3

Key Scientific Concepts & Basic Chemistry; Biomolecules; Chemical Quantities; DNA Structure and Roles



### MODULE 4

Biological Systems Introduction; Cell Theory; Cell Physiology; Cell Staining Techniques



### MODULE 5

Workplace Safety; Handling Biological & Hazardous Waste; Safety Data Sheets & Labeling Protocols



### MODULE 6

Measuring Liquids; Electronic Balances; Aseptic & Sterile Environments; Culturing Microorganisms; Solutions, Buffers, and Media; Measuring and Adjusting pH



### MODULE 7

Applied Mathematics; Metric System Conversions; Preparing Solutions; Dilutions & Dilution Factors; Graphing and Data Analysis



### MODULE 8

Biotechnology Lab Equipment; Mixing & Separating Equipment; Heat & Humidity Equipment

## LAB MODULES



### PPE & Safety

Personal protective equipment, handwashing techniques, protocols for biological & chemical waste management, safety and regulatory procedures



### Cleanroom Procedures

Full gowning, entry and exit procedures, set up sterile environment, cross-contamination prevention, waste disposal protocols



### Decontamination & Sterilization

Multi-surface sterilization, ceiling to floor protocols, autoclaving and UV sterilization, and proper aseptic techniques



### Microscope Use

Familiarization with microscope components, utilization & magnifications, and proper cleaning and storage



### Simple & Differential Stains

Prepare and heat-fix smears for methylene blue simple staining and Gram staining procedures, utilizing aseptic techniques throughout activity



### Measuring Solids & Liquids

Accurately measure solids with an electronic balance and liquids using graduated cylinders, micropipettes, and proper meniscus technique



### Preparing Mixtures, Buffers, and Media

Accurately prepare chemical solutions, pH-adjusted buffers, and growth media using proper measurement, mixing, and labeling techniques for storage and use.



## Building Alabama's Biotech Workforce

Students who complete the **Skills for Success Biotechnician** non-credit credential gain practical, job-ready skills for immediate employment or continued education. Through Prior Learning Assessment (PLA), competencies may count toward an **Associate in Science (AS) Degree** in Biology, offered statewide and aligned with four-year transfer pathways through [Alabama Transfers](#). Several colleges also offer or are developing biotechnology concentrations that combine classroom instruction with hands-on laboratory experience—designed in partnership with industry to meet regional workforce needs.



To support the full spectrum of Alabama's biotechnology economy, community colleges offer workforce training across connected industries—from agriculture and laboratory sciences to industrial production and chemical processing.

Related Programs That Support Biotechnology Careers Include:

- Air Conditioning & Refrigeration
- Biomedical Equipment Technology
- Electrical & Instrumentation
- Industrial Electronics
- Industrial Maintenance
- Medical Lab Technicians
- Pharmacy Technician
- Phlebotomy
- Precision Machining
- Process Technology
- Production
- Robotics
- Logistics
- Welding



Expands registered apprenticeships and work-based learning to support employers, workers, and economic growth.



FAME chapters deliver advanced manufacturing training integrated with paid, hands-on experience at host companies.



Provides workforce training, technical assistance, and engineering services supporting industrial operations and continuous improvement.



## Inspiring Alabama's Biotech & STEM Talent Pipeline

*A snapshot of two statewide organizations expanding access to hands-on science education and generating awareness of relevant career pathways.*



HudsonAlpha engages students and educators across Alabama through immersive, hands-on biotechnology experiences that connect classroom learning to real-world careers. Each year, nearly 2,000 middle and high school students and teachers participate in lab-based field trips, workshops, and outreach programs that introduce modern genomics and biotechnology practices. HudsonAlpha also prepares high school, college, and associate-degree students for the workforce through multi-week and semester-long training programs that build critical lab skills. Many participants earn the nationally recognized Biotechnology Aptitude and Competency Exam (BACE) credential and gain access to internships and employment opportunities. Through initiatives such as BioTrain and the Biotech Launch Experiential Learning Program, HudsonAlpha helps students move seamlessly from education into Alabama's growing biotech economy.



Southern Research advances Alabama's STEM ecosystem by providing engaging, hands-on learning experiences that spark curiosity and expose students to careers in science and biotechnology. Through field trips, school visits, and interactive demonstrations, Southern Research reaches students in grades K-12—at no cost to schools—bringing real-world science directly into classrooms. Middle and high school students can further explore biotechnology through immersive summer camps and enrichment programs that emphasize problem-solving, collaboration, and mentorship from professionals in the field. Southern Research also supports the next generation of educators and scientists by employing undergraduate interns and STEM ambassadors who gain leadership experience while helping deliver outreach programming statewide. Together, these initiatives help build a more inclusive, skilled, and future-ready STEM workforce.



*Photo credit: Southern Research*



# Industry Collaborations



“Our colleagues with the Alabama Community College System (ACCS) are actively working to provide both education and opportunity for local, homegrown talent to support the burgeoning biotechnology industry in Alabama. The Skills for Success Biotechnician course, featuring comprehensive content developed by subject-matter experts and incorporating essential hands-on training, is specifically designed to address the unique personnel training needs of the pharmaceutical and biotechnology sectors. The creation of this industry-ready talent pool is invaluable for Evonik and other biotech-related companies operating within the state.”

**Brad Cates, Global Business Segment Head – Drug Product CMO**

“The Biotechnician course provides an integral framework in the principles of biotechnology to students endeavoring to fulfill entry-level positions within research and development, manufacturing, quality control, and quality assurance. The course’s emphasis on foundational knowledge and practical application was designed by Alabama industry and academic leaders to provide you with a competitive edge in the job market and help advance your new career in the Biotech and Pharmaceutical industry. This course is a valuable investment for your career!”

**Bob Rodebaugh, Ph.D., Executive Director, Manufacturing**



“HudsonAlpha Institute for Biotechnology is proud to partner with the Alabama Community College System (ACCS) to grow and strengthen Alabama’s life sciences workforce. Through collaborative programs like Biotech Launch, we work alongside community colleges to provide students with hands-on lab experience, industry-focused training, and internship opportunities that prepare them for meaningful careers in biotechnology. This partnership is essential to building a strong STEM talent pipeline and supporting continued innovation and economic growth across the region.”

**Michele C. Morris, Director of Workforce Development**

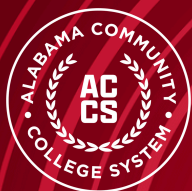
“At Southern Research, hands-on training is essential to preparing individuals for the rigor and precision of laboratory-based scientific work. Southern Research employs individuals across the full spectrum of careers within the drug discovery and development field, and experiential learning is critical to bridging the gap between theory and practice for these jobs. The Alabama Community College System (ACCS) is helping close this training gap through its Skills for Success Biotechnology Technician program, which combines industry-informed curriculum with hands-on lab experience.”

**LaVinia Ray, Director, Workforce Development & Training**



The Alabama Community College System is also a proud member and sponsor of BioAlabama, the State’s advocate and professional organization for the bioeconomy, promoting the intellectual and innovative capital that make Alabama a premier place to invest, start, and grow in bioscience.

For more information, scan the QR code or visit [economicdevelopment.accs.edu](http://economicdevelopment.accs.edu)



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