

BIOMANUFACTURING TECHNOLOGY, ASSOCIATE OF APPLIED SCIENCE



From Lab to Life: Your Biotech Career Starts Here

San Jacinto College's Biomufacturing Technology program equips students with specialized, hands-on training in the biotechnology industry. Biotechnology is the use of living systems, cells, and biological processes to develop products that improve our health and quality of life. Biomufacturing is where biotechnology meets large-scale production to create medicines, vaccines, chemicals, and other products.

The program offers advanced instruction in core areas such as upstream and downstream processing, quality assurance, and regulatory compliance. Designed for individuals seeking to enhance their foundational knowledge, this pathway prepares candidates for immediate entry into the workforce or career advancement in the fast-growing biomufacturing sector.

Career Opportunities and Income

Visit [sanjac.edu](https://www.sanjac.edu/programs/areas-of-study/stem/biomufacturing-tech/) (<https://www.sanjac.edu/programs/areas-of-study/stem/biomufacturing-tech/>) for information regarding career opportunities and potential earnings in the Greater Houston region.

Learning & Career Pathway

This learning pathway — a series of related and “stacked” certificates and degrees — includes the following awards. You can start at any point on the path and earn certificates on your way to completing the degree.

- Biomufacturing Technology, Occupational Certificate (<https://publications.sanjac.edu/areas-of-study/science-technology-engineering-math/biomufacturing-tech-occupational-certificate/>) (6 months)
- Biomufacturing Technology, Level II Certificate (<https://publications.sanjac.edu/areas-of-study/science-technology-engineering-math/biomufacturing-tech-level-2-certificate-technology/>) (1.5 years)
- Biomufacturing Technology, Associate of Applied Science Degree (<https://publications.sanjac.edu/areas-of-study/science-technology-engineering-math/biomufacturing-tech-aas/>) (2 years)

The **Advanced Technical Certificate (ATC)** in Biomufacturing is designed for students who already hold an associate's or bachelor's degree. Providing focused, specialized training to build advanced skills for industry needs, the ATC offers a faster path to career entry or

advancement in this field. If you have a prior degree and want to gain expertise in biomufacturing, this certificate is an efficient way to upskill.

- Biomufacturing Technology, Advanced Technical Certificate (<https://publications.sanjac.edu/areas-of-study/science-technology-engineering-math/biomufacturing-tech-advanced-tech-certificate/>) (1 year)

Learning Outcomes and Career Skills

A student completing the last award in the pathway will be able to:

- Follow Standard Operating Procedures (SOP).
- Record results following Good Document Practices (GDP).
- Conduct all processes under Good Manufacturing Practices (GMP) standards.
- Exhibit clean and safe work practices and procedures.
- Observe and interpret work conditions and report unsafe conditions.
- Prepare, maintain and troubleshoot biomufacturing process equipment.
- Prepare materials and properly store media, buffers, solutions, and reagent batches.
- Perform cell culture and fermentation.
- Prepare, initiate (inoculation), and monitor (media addition) cell culture.
- Perform scale-up operations.
- Execute sampling and assessment of product for release.
- Perform testing and data analysis.
- Perform microbiology and chemical testing.
- Apply physics and chemistry involved in common manufacturing processes.
- Demonstrate ability to perform basic upstream and downstream testing.
- Interpret and report aberrant parameters and results.
- Perform product purification.
- Perform filtration and purification of released product.
- Apply quality control and quality assurance methods.
- Exhibit quality communication and collaboration skills.

External Learning Experiences

This program includes external learning experiences outside of the classroom, e.g., an internship, externship, clinical, practicum, or cooperative learning experience. Those experiences are typically on-site at a business or organization.

All students participating in external learning experiences are required to comply with the immunization requirements and policies of the external learning sites. Some learning sites outside the college have their own vaccination requirements. These rules come from those facilities and are not mandated by the college. Failure to meet those immunization requirements may limit a student's ability to complete the program and/or may delay the student's graduation date. San Jacinto College does not process exemptions, and students should address potential vaccination exemptions directly with the external learning site.

Locations

- Generation Park (<https://www.sanjac.edu/about/locations/generation-park/>)
- South (<https://www.sanjac.edu/about/locations/south/>)

College Admission

San Jacinto College is an open admission institution. All students are welcome to apply and will be admitted to the College. You may begin the process on the College's "How to Apply (<https://www.sanjac.edu/admissions/how-to-apply/>)" webpage.

Program Admission

In addition to being admitted to the College, students must also be admitted to the Biomanufacturing Technology program, which has additional requirements and/or steps. Meeting the minimum admission requirements does not guarantee acceptance into the program.

plan of study

3BIO-MFG

First Year

First Term

Select one of the following: 3

MATH 1314	College Algebra	
MATH 1316	Plane Trigonometry	
MATH 1324	Mathematics for Business and Social Sciences	
MATH 1325	Calculus for Business and Social Sciences	
MATH 1342	Elementary Statistical Methods (Statistics)	
MATH 1350	Mathematics for Teachers I (Fundamentals of Mathematics I)	
BITC 1411	Introduction to Biotechnology	4

Select one of the following: 4

BIOL 1306 & BIOL 1106	Biology for Science Majors I (lecture) and Biology for Science Majors I (lab)	
BIOL 2301 & BIOL 2101	Anatomy and Physiology I (Lecture) and Anatomy and Physiology I (Lab)	
BITC 1191	Special Topics in Biological Technology/ Technician	1

Credits 12

Second Term

Select one of the following: 4

CHEM 1305 & CHEM 1105	Introductory Chemistry I (lecture) and Introductory Chemistry I (lab)	
CHEM 1311 & CHEM 1111	General Chemistry I (lecture) and General Chemistry I (lab)	

Select one of the following: 4

BIOL 2320 & BIOL 2120	Microbiology for Health Science Majors (lecture) and Microbiology for Health Science Majors (lab)	
BIOL 2321 & BIOL 2121	Microbiology for Science Majors (lecture) and Microbiology for Science Majors (lab)	
BITC 1340	Quality Assurance for the Biosciences	3

BITC 1402	Biotechnology Laboratory Methods and Techniques	4
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Credits 15

Summer Year One Term

ENGL 1301	Composition I	3
BCIS 1305	Business Computer Applications	3

Credits 6

Second Year

First Term

BITC 2411	Biotechnology Laboratory Instrumentation	4
BITC 2277	Product Development to Commercialization	2

Select one of the following: 3

Language, Philosophy and Culture (Humanities)

Creative Arts (Fine Arts)

Social and Behavioral Sciences 3

Credits 12

Second Term

BITC 2431	Cell Culture Techniques	4
BITC 2445	Medical Biotechnology	4
BITC 2475	Upstream and Downstream Manufacturing of Biologics	4

BITC 2386 or BITC 2387	Internship - Biotechnology Laboratory Technician Capstone or Internship - Biotechnology Laboratory Technician Experience	3
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Credits 15

Total Credits 60

Capstone Experience: BITC 2386 Internship - Biotechnology Laboratory Technician Capstone or BITC 2387 Internship - Biotechnology Laboratory Technician Experience.