BACHELOR OF SCIENCE IN BIOTECHNOLOGY

WHAT IS BIOTECHNOLOGY?

Biotechnology is a multidisciplinary field that involves the application of biological principles and engineering technology to develop products and systems that benefit mankind and nature. It integrates diverse biological disciplines such as genetics, molecular biology, biochemistry, embryology, and cell biology with technical fields like engineering, information technology, and robotics. Its applications span various industries, contributing significantly to drug development, medical treatments, agriculture, food processing, biosecurity, and biofuels. Continuous exploration leads to the discovery of new techniques and applications within the field of biotechnology.

CAREERS IN BIOTECHNOLOGY

Biotechnology students at the University of Houston (UH) Cullen College of Engineering's Technology Division will be prepared for graduate school or careers in the biotechnology industry, including drug manufacturing and production, quality control, marketing and sales, or professional programs such as medicine, law, clinical research, and information systems. The Cullen College of Engineering has a dedicated Engineering Career Center, which connects hundreds of students each year to internships and full-time positions.

WHY EARN YOUR BIOTECHNOLOGY DEGREE AT THE UNIVERSITY OF HOUSTON?

ACADEMICS

Biotechnology is an interdisciplinary degree program that teaches students knowledge and skills spanning science, technology, engineering, and mathematics in an application-oriented undergraduate education. The biotechnology degree program aims to prepare students for employment in the critically important and dynamic biotechnology industry. The ATMAE-accredited biotechnology curriculum at UH is the first program in Texas that provides hands-on experience to integrate bioprocessing, nanobiotechnology, bioinformatics, and environmental biotechnology.

Recognizing the need to strengthen undergraduate education that fosters cross-disciplinary training and collaborative interactions, the biotechnology degree program combines practical, hands-on biotechnology training with innovative biotechnology research and teaching. The presence of the Texas Medical Center and growing biotechnology ventures and pharmaceutical industry in the greater Houston area positions the UH program at the forefront of biotechnology education to get good paying jobs. The bioprocessing and bioinformatics track options give students the flexibility to tailor their degrees based on their interests, educational background, and career goals in pharmaceutical and biomedical industries.

Bioprocessing Track - Bioprocess uses living cells to manufacture desired products and drugs. One good example is using genetically altered bacteria to produce a therapeutic drug like insulin. Courses: Introduction to Quality Assurance and Quality Control in Biotechnology, Microbial Biotechnology, Principles of Bioprocessing and Molecular Genetics.

Bioinformatics Track - Bioinformatics is applying computational technology to manage biological information (e.g., the documentation and analysis of an organism's genetic sequence). Courses: Information Systems Analysis & Design, Database Management, Principles of Bioinformatics and Applied Bioinformatics.
Learn more at https://dot.egr.uh.edu/programs/undergraduate/biotechnology

RESEARCH

Research encompasses a diverse range of areas that span the cutting-edge intersection of biology, technology, and innovation. A diverse and experienced group of faculty and students are working in fields like metabolic engineering and synthetic biology, agriculture microbiomes, biofuels, environmental remediation, tissue engineering, and emerging genomics and bioinformatics technologies to advance knowledge in medicine, agriculture, and environmental sustainability through innovative research.

SCHOLARSHIPS

Merit-based scholarships are awarded by the UH Cullen College of Engineering's Technology Division. The UH Office of Scholarships and Financial Aid also offers scholarships. Additionally, the university's co-op program offers students the opportunity to receive career training while financing their education. Learn more at https://dot.egr/uh.edu/advising/financial-aid/scholarships.

STUDENT ORGANIZATIONS

Students are encouraged to join academic and professional organizations to build leadership, communication, and networking skills. Members of student organizations receive career guidance from industry professionals and participate in activities that promote their field of study.

The Society for Biological Engineering at the UH Cullen College of Engineering's Technology Division is a student organization that caters to students aspiring to enter fields related to biological engineering. This student organization devotes its efforts to integrating members with industries that can benefit from the knowledge and skill set of an engineer, technologist, and biologist combined. Students get the opportunity to attend events throughout the year and listen to invited guest speakers from industries.

ET/BTEC FAST FACTS

850/261 Total Undergraduate Students
29/6 Total Faculty
$40,000 – $70,000* Average Salary
26:1 Student-to-Faculty Ratio Across the University
* https://www.bls.gov/oes/current/oes_nat.htm#17-0000

Technology Division
Cullen College of Engineering

BACHELOR OF SCIENCE IN BIOTECHNOLOGY

FOUR-YEAR ACADEMIC MAP 2023-2024

YEAR 1

SEMESTER 1			SEMESTER 2			Total
BIOL1306/1106	Biology for Science Majors I	4	BIOL 1307/1107	Biology for Science Majors II	4	
MATH 2312	Precalculus	3	CHEM 1311/1111	General Chemistry I & Lab	4	
*BTEC 1322	Intro to Biotechnology	3	MATH 2413	Calculus I	4	
ENGL 1301	First Year Writing I	3	ENGL 1302	First Year Writing II	3	
HIST 1301	U. S. to 1877	3				
	Semester Hours	**16**		**Semester Hours**	**15**	**31**

YEAR 2

SEMESTER 1			SEMESTER 2			
CHEM 312/1112	General Chemistry II & Lab	4	CHEM 2323/2123	Fund of Organic Chemistry & Lab	4	
BIOL 2321/2121	Microbiology for Sci Majors & Lab	4	PHIL 1305	Introduction to Ethics	3	
CORE	Creative Arts	3	HIST 1302	U. S. since 1877	3	
GOVT 2306	US & Texas Constitution & Politics	3	PHYS 1301	College Phys I	3	
MATH 1342	Elem Statistical Methods	3	GOVT 2305	US Government	3	
	Semester Hours	**17**		**Semester Hours**	**16**	**33**

YEAR 3

SEMESTER 1			SEMESTER 2			
BCHS 3304	General Biochemistry	3	*CIS 2334	Information Systems Applications	3	
CORE	Social & Behavioral Sciences	3	*BTEC 3200	Biotechnology Research Methods and Applications	2	
*BTEC 2322	Introduction to Biopython	3	*BTEC 3321	Current Good Manufacturing Prac	3	
*BTEC 3317	Biotechnology Regulatory Environment	3	*BTEC 3301	Prin of Genomics/Proteomics & Bioinformatics	3	
*BTEC 3302	Molecular Genetics & Biotechnology	3	*TLIM 3363	Technical Communication	3	
	Semester Hours	**15**		**Semester Hours**	**14**	**29**

YEAR 4

SEMESTER 1			SEMESTER 2			
*BTEC 3320 or ELET 4350	Intro to QA/QC in BTEC or Computational Health Informatics	3	*BTEC 4319 or Approved Elective	Microbial Biotechnology or See advisor	3	
Approved Elective	See advisor	3	*BTEC 4301/4101 or *BTEC 4300/4100	Prin of Bioprocessing & Lab or Principles of Bioinformatics & Lab	4	
*TLIM 3340	Organizational Leadership & Super	3	*BTEC 4350	Biotechnology Capstone	3	
*BTEC 4249	Biotechnology Capstone I	2	Free Elective		3	
Free Elective		3				
	Semester Hours	**14**		**Semester Hours**	**13**	**27**
				TOTAL SEMESTER HOURS		**120**

FOR MORE INFORMATION

**Students should meet with their academic advisor to formulate their own plan. Course offerings are subject to change.*

UH Cullen College of Engineering Technology Division: https://dot.egr.uh.edu/
Biotechnology Undergraduate Program: https://dot.egr.uh.edu/programs/undergraduate/biotechnology | Email: asc@uh.edu

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