

BIOMANUFACTURING

BS DEGREE

Description

Biomanufacturing leverages the understanding of biology to manufacture products or perform services that impact health, agriculture, the environment, and industrial needs. As a product or service progresses from discovery research through development and into production, the science becomes increasingly less isolated. Through a transformation of scale, process control, and compliance, the science of biomanufacturing lives across the product and process life cycle within a quality management system. The biomanufacturing baccalaureate develops the skills, abilities, and knowledge for students to work in the unique environment of biological production where the science thrives in partnership with quality and compliance.

This degree program explicitly emphasizes the applied, quantitative analysis of biomanufacturing process design and performance. The biomanufacturing degree will prepare students for employment in technical or quality positions in the manufacturing sector of the biotechnology industry, which includes biotherapeutics, diagnostics, supplies and services, and industrial products.

Career Opportunities

The proposed baccalaureate program in biomanufacturing will prepare students for employment in the manufacturing sector of the biotechnology industry, which includes biotheurapeutics, diagnostics, supplies and services, and industrial products. The degree will prepare graduates for technical and quality assurance/control-related positions. The biomanufacturing BS degree explicitly builds upon the College's existing biotechnology program, which currently offers three certificates and one associate degree (Appendix G). The new degree will allow students who complete the local associate degree or equivalent course work from other colleges to earn a baccalaureate, which will better prepare them for entry-level positions in biotechnology within the region and beyond. The biomanufacturing BS program will serve the needs of the growing biotechnology economic sector in San Diego County.

Program Learning Outcomes

Upon successful completion of this program, students will be able to:

1. Students will be able to design and execute a project that identifies possible options of new biomanufacturing technologies that serve as process improvements, including technical and financial benefits, and write a report evaluating those options with a final recommendation.
2. Students will be able to perform an investigation that requires them to analyze an Out of Specification (OOS) occurrence during a production step in the manufacture of a biological substance, perform the analysis to justify the batch disposition, and incorporate this into a CAPA (Corrective Action Preventative Action) report.

Degree Requirements:

Credit Hours: (45 Required)

BTEC300	Supply Chain and Enterprise Resource Planning in Biomanufacturing	3
BTEC310	Biomanufacturing Process Sciences	5
BTEC320	Design of Experiments for Biomanufacturing	4
BTEC330	Advanced Topics in Quality Assurance and Regulatory Affairs	4
BTEC340	Six Sigma and Lean Manufacturing	3
BTEC360	Design of Biomanufacturing Facilities, Critical Utilities, Processes, and	3

	Equipment	
BTEC400	Bioprocess Monitoring and Control	4
BTEC410	Methods in Quality, Improvements, Investigations, and Audits	4
BTEC460	Capstone Seminar in Biomanufacturing Technologies	3
BTEC470	Capstone Seminar in Biomanufacturing Quality	3
BIO340	Molecular Mechanisms of Disease	3
BUS302	Leadership and Personal Development	3
PHIL302	Bioethics	3

Total: 45

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