

# Downstream Biomanufacturing (Certificate)

Graduate students and working professionals can now earn a new credential to kick-start or advance their career in the biopharmaceutical industry. The Downstream Biomanufacturing graduate certificates offer NC State graduate students and working professionals the opportunity for hands-on learning in BTEC's industry-scale simulated cGMP facilities.

Each certificate requires 12 hours of graduate coursework, which can be transferred to the Master of Biomanufacturing program. The majority of BTEC's graduate courses are offered in the evening or online to better accommodate working professionals.

The certificate can be completed in two part-time semesters.

## More Information

Downstream Biomanufacturing Program Website ([http://www.btec.ncsu.edu/academic/graduate/graduate\\_certificate.php](http://www.btec.ncsu.edu/academic/graduate/graduate_certificate.php))

To enroll in a BTEC certificate program, applicants must meet the following conditions:

- Applicants must hold a bachelor's degree in science or an engineering discipline.
- Applicants must have a minimum GPA of 3.0 or have completed a 500-level BTEC (BEC) course with a grade of B- or better.
- Applicants must apply through the NC State Graduate School.

## Applicant Information

- **Delivery Method:** On-Campus
- **Entrance Exam:** None
- **Interview Required:** None

## Plan Requirements

Code	Title	Hours	Counts towards
<b>Required Courses</b>		<b>9</b>	
BEC 532	Foundations of Downstream Processing and Formulation		
BEC 536	Introduction to Downstream Process Development		
BEC 585	cGMP Downstream Operations		
BEC 575	Global Regulatory Affairs for Medical Products		
<b>Elective Course</b>		<b>3</b>	

Select a minimum of three credits of the following:

BEC 515	Biopharmaceutical Product Characterization Techniques
BEC 577	Advanced Biomanufacturing and Biocatalysis
BEC 590	Industry Practicum in Biomanufacturing
BUS 554	Project Management
<b>Total Hours</b>	<b>12</b>