



**Course Title:** SBE's Biomanufacturing for Chemical Engineers

Course ID:	Course Type:
ELA103	eLearning Course
<a href="http://www.aiche.org/ela103">www.aiche.org/ela103</a>	

**Course Outline**

- **Lecture 1:** Biomanufacturing Products and Processes
- **Lecture 2:** Cryopreservation and Cell Banking
- **Lecture 3:** Cell Nutrition and Media
- **Lecture 4:** Cell Growth in Production Bioreactors
- **Lecture 5:** Mass Transfer in Bioreactors
- **Lecture 6:** Bioreactor Control Parameters and Process Analytical Technology (PAT)
- **Lecture 7:** Centrifugation and Other Harvest Techniques
- **Lecture 8:** Chromatography Principles and Procedures
- **Lecture 9:** Chromatography Equipment and Performance
- **Lecture 10:** Viral Clearance
- **Lecture 11:** Ultrafiltration and Bulk Filling