

## Biochemical Engineering

**Downstream Processing for Engineers (BENG0012)****Description**

The recovery, purification and formulation of biological products from complex sources such as fermentation or cell broths represents the major challenge to the provision of safe and effective materials e.g. for therapeutic use. The course first establishes a physical understanding of the unit operations important to bioprocessing, on which basis engineering design equations are established; in this way, efficient steps can be designed and combined to produce efficient bioprocesses. Control of such unit operations is described in way that permits integrated design and control of whole bioprocess sequences. The theoretical material is supported and integrated with practical learning. Students undertake a series of short laboratory practical sessions throughout the year and attend 2 week-long problem-based scenarios (Ultra Scale-down tools scenario for speeding the therapy supply and pilot plant week). Upon completion of the course, a student should be able to: Learn the principles of design, selection and operation of units operations for the processing of biological products and their subsequent configuration as process sequences operated under control, Use realistic design equations to describe quantitatively many of the critical post-bioreactor steps including filtration, centrifugation, cell disruption, affinity chromatography, liquid-liquid extraction, and precipitation, Understand how and when to use scale-up and scale-down procedures, including ultra-scale-down methods, Understand and be able to apply engineering design equations for individual steps to create efficient whole bioprocesses, Understand how practical performance of bioprocess operations and sequences will differ from idealised descriptions through live, hands-on experimentation.

**Key information**

<b>Year</b>	2019/20
<b>Credit value</b>	30 (300 study hours)
<b>Delivery</b>	UG L5, Campus-based
<b>Reading List</b>	<a href="#">View on UCL website</a>
<b>Tutor</b>	<a href="#">Prof Ajoy Velayudhan</a>
<b>Term</b>	Terms 1 and 2
<b>Timetable</b>	<a href="#">View on UCL website</a>

**Assessment**

- Written examination (main exam period): 50%
- Oral examination (departmentally managed): 25%
- Coursework: 25%

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