Advanced Bioreactor Engineering (BENG0090)

**Description**
This course provides students with a detailed understanding of bioreactor design, scale-up and operation. It considers both whole cell (i.e. fermentation) and enzymatic (i.e. biotransformation) conversion processes for the synthesis of complex materials such as therapeutic proteins, antibiotics, gene therapy vectors and chiral pharmaceuticals. Particular themes of the course include the interaction of biological catalysts and molecules with the engineering environment within a bioreactor, the theoretical basis of process scale-up and scale-down, and the impact of rDNA techniques on bioreactor design and operation. Particular attention is paid to the instrumentation and control of bioreactors and issues underlying biosafety with respect to contained operation.

**Intended learning outcomes**
Upon completion of the course, a student should be able to:

- Specify bioreactor characteristics and monitoring and control systems
- Understand how bioreactor operation and scaling affects cell growth and productivity
- Perform design calculations with regards to scale-up and scale-down of a fermentation process
- Evaluate how the kinetics of free or immobilised enzyme affects bioreactor selection and operation
- Relate fundamental knowledge of transport processes and bioreactor engineering to current industrial practice
- Appreciate the impact of rDNA techniques on biocatalyst kinetics and process design

**Key information**
- **Year**: 2019/20
- **Credit value**: 15 (150 study hours)
- **Delivery**: PGT L7, Campus-based
- **Reading List**: View on UCL website
- **Tutor**: Prof Gary Lye
- **Term**: Term 1
- **Timetable**: View on UCL website

**Assessment**
- Written examination (main exam period): 70%
- Coursework: 30%

**Find out more**
For more information about the department, programmes, relevant open days and to browse other modules, visit ucl.ac.uk

**Disclaimer**: All information correct as of August 2019. Please note that aspects of the module may be subject to change. UCL will make best efforts to inform applicants of major changes.
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