BB2520 Bioprocess Design 15.0 credits

Bioprocessdesign

This is a translation of the Swedish, legally binding, course syllabus.

If the course is discontinued, students may request to be examined during the following two academic years

Establishment

Course syllabus for BB2520 valid from Autumn 2019

Grading scale

A, B, C, D, E, FX, F

Education cycle

Second cycle

Main field of study

Biotechnology,Chemical Science and Engineering

Language of instruction

The language of instruction is specified in the course offering information in the course catalogue.

Intended learning outcomes

After completing the course, students should be able to:

- Describe how to take a biotechnological process from discovery stage to pilot scale.
- Use a simulation model to design and optimize product titer, rate and yield of a cultivation process.
- Contribute to and co-organize the work in a project group.
- Design, plan, operate and analyze down-scaled experiments in cultivation technology or downstream processing to support the design of a biotechnological process.
- Document, analyze and evaluate a design of a process for microbial production, purification and concentration of a biotechnological product.

Course contents

The course provides practical and theoretical understanding of the elements of taking a bio-product from the discovery stage to successful pilot scale production according to a desired output with respect to product quantity, quality and process documentation. The goal is further to perform the project in close relationship to actual industrial working methodology i.e. the project is managed and operated in a project group format and theoretical lectures are only used to give the background to a selected range of techniques. Techniques used include: Cultivation technology (continuous and fed-batch cultivation, medium design, scale-up of bioprocesses, process rheology), calculation of modeling constants from cultivations, downstream processing, project planning and management, industrial management and organization, Matlab modelling and simulation (cultivation), factorial design for process development, small and pilot scale production, process documentation.

Specific prerequisites

Entry requirements for MSc Industrial and Environmental Biotechnology (or equivalent), including a passed examination in BB1210 Purification of Biomolecules (or equivalent) and BB1300 Cultivation Technology (or equivalent). The ‘downstream processing and processes’ course from the MSc Industrial and Environmental Biotechnology (or equivalent) is highly recommended.

Course literature

Selected articles and book chapters provided by teachers.

Examination

- PRO1 - Project Planning part 1, 2.0 credits, grading scale: P, F
- PRO2 - Project Planning part 2, 4.0 credits, grading scale: P, F
- REP1 - Final Report, 9.0 credits, grading scale: A, B, C, D, E, FX, F

Based on recommendation from KTH’s coordinator for disabilities, the examiner will decide how to adapt an examination for students with documented disability.

The examiner may apply another examination format when re-examining individual students.

The examiner, together with the KTH disability coordinator (Funka), decides on possibly adjustments to the examination for students with proven and documented permanent disabilities. The examiner may allow another examination form when re-examining individual students.

Other requirements for final grade

Passed final written report, passed experimental plan, passed pilot plan, passed final presentation.

Ethical approach

- All members of a group are responsible for the group's work.
- In any assessment, every student shall honestly disclose any help received and sources used.
- In an oral assessment, every student shall be able to present and answer questions about the entire assignment and solution.