



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 2011

Grading scale

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

Education cycle

Second cycle

Main field of study

Biotechnology, Chemical Science and Engineering

Specific prerequisites

At least 150 credits from grades 1, 2 and 3 of which at least 100 credits from years 1 and 2, and a degree project, first level, must be completed.

The 150 credits should include a minimum of 20 credits within the fields of Mathematics, Numerical Analysis and Computer Sciences, 5 of these must be within the fields of Numerical Analysis and Computer Sciences, 20 credits of Chemistry, possibly including courses in Chemical Measuring Techniques and 20 credits of Biotechnology or Molecular Biology.

Language of instruction

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

Intended learning outcomes

The course has the goal to give both practical and theoretical understanding of the elements of taking a bioproduct 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.

Course contents

Cultivation technology (continuous and fedbatch cultivation, medium design, scale-up of bioprocesses, process rheology), downstream processing, project management, industrial management and organisation, Matlab modelling and simulation (cultivation), factorial design for process development, small and pilot scale production, process documentation.

Disposition

- Matlab modeling and simulation of a fedbatch process
- Deriving of modeling constants through use of continuous cultivation
- Use of a Matlab model for continuous cultivation start-up
- Product optimisation using software for factorial design (parameters: feed profile, pH, temp and point of induction)
- Medium design
- Scale up of bioprocesses
- Process rheology impact on production
- Small and pilot scale bioreactor set-up and operation
- Economy overview calculation
- Process documentation methodology (industrial concept)
- Project planning management; theory and practice
- Design of the down stream operations

Course literature

Compendium, selected articles.

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.

Part 1 (project plan 1). Individual. Mandatory. P/F. 2 credits.

Part 2 (project plan 2). Individual. Mandatory. P/F. 4 credits.

Report: Process documentation. Individual. Mandatory. A-F. 9 credits.

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.