Biotechnology Manufacturing

Programme course

6 credits

Bioteknisk tillverkningsteknik

TFTB39

Valid from: 2017 Spring semester

Determined by
Board of Studies for Chemistry, Biology and Biotechnology

Date determined
2017-01-25

Offered for the last time
Spring semester 2023

Replaced by
TFTB51

Main field of study
Engineering Biology

Course level
Second cycle

Advancement level
A1X

Course offered for
- Chemical Biology
- Engineering Biology, M Sc in Engineering

Entry requirements
Note: Admission requirements for non-programme students usually also include admission requirements for the programme and threshold requirements for progression within the programme, or corresponding.

Prerequisites
Courses in technology and natural sciences according to the KB/TB program year 1-3. Ability to simulate bioreactors using MATLAB or equivalent software programs. Basic knowledge on large-scale bioprocessing. Basic knowledge on production systems in industrial biotechnology, biostatistics, and pharmaceuticals based on biotechnology.

Intended learning outcomes
The course gives the students an overview of the field and give them experience in solving engineering tasks of process analytical and process design character. Focus is on manufacturing of biologicals. Practical training in cultivation techniques and use of bioreactor equipment. Training in oral and written reporting using adequate engineering terminology. Good understanding for principles of process analytical technology concepts (PAT) and quality by design (QbD) aspects on manufacturing.

Course content
Design and simulation methodology for industrial biotechnical production processes. Focus on pharmaceutical products. Training in culturing protein producing organisms and use of advanced monitoring and control techniques; design tool software programming; mathematical modelling of key design issues. Analytical methods for cultivation and in-process control. Regulatory quality guidelines for biotechnology manufacturing. Training in presentation skills.

Teaching and working methods
The course program is based on classes, laboratory modelling and project. The project takes three full days. The course is coordinated with the CDIO-course TFTB32 and NKED20 Pharmaceutical Development.

Examination

LAB1	Written laboratory report	2 credits	U, G
UPG1	Project	4 credits	U, 3, 4, 5
UPPG1		0 credits	

Participation at seminars (80%).
Project report is graded

Grades
Four-grade scale, LiU, U, 3, 4, 5

Department
Institutionen för fysik, kemi och biologi

Director of Studies or equivalent
Magnus Boman

Examiner
Carl-Fredrik Mandenius

Education components
Preliminary scheduled hours: 66 h
Recommended self-study hours: 94 h

Course literature

Mandenius CF, Föreläsnings- och laborationskompendium, Tryckakademin, Linköping

Common rules

Regulations (apply to LiU in its entirety)

The university is a government agency whose operations are regulated by legislation and ordinances, which include the Higher Education Act and the Higher Education Ordinance. In addition to legislation and ordinances, operations are subject to several policy documents. The Linköping University rule book collects currently valid decisions of a regulatory nature taken by the university board, the vice-chancellor and faculty/department boards.

LiU's rule book for education at first-cycle and second-cycle levels is available at http://styrdokument.liu.se/Regelsamling/Innehall/Utbildning_pa_grund-_och_avancerad_niva.