Biotechnical Production Systems

Programme course

6 credits

Biotekniska produktionssystem

TMMT03

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

Main field of study
Engineering Biology, Mechanical Engineering

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
Industrial biotechnology

Intended learning outcomes

The overall goal of the course is for students to gain knowledge and understanding of modern industrial production, with a special focus on biotechnical production systems. By combining knowledge from this course with other courses students should gain the ability to design and operate cost-effective and productive biotechnical production systems.
Knowledge objectives for the course are:

- Knowledge of and understanding for modern industrial production, with a special focus on biotechnical production systems.
- Knowledge about the design and operation of production systems for a biotechnical product, where the biotechnical-related process steps are an integrated part of the total production system.

Skill goals for the course are:

- Be able to analyze a production system with the help of the Rapid Plant Assessment (RPA) method
- Be able to to judge the prerequisites for an industrial biotechnical production system, and to independently draw conclusions regarding these prerequisites.
- Independently collect and evaluate information that is relevant for the design and operation of an industrial biotechnical production system. Given this, be able to prioritize, verify and critically analyze the information
- Become familiar with generic theories regarding production design and operations of a production system in its environment, and apply them to real companies within the biotechnology area
- Integrate and synthesize information collected with generic theories relevant for the design and operation of an industrial biotechnical production system

Course content

The course focused around the concepts and issues that are important for most types of modern industrial production but with a special application of biotechnological production systems. Key areas addressed in the course is, for example, operations management, operations strategy, operations networks, layout and flow, job design and work organization, capacity and inventory planning and control, supply chain planning and control, just-in-time planning and control , project planning and control, quality planning and control, total quality management (TQM), and production economics.

Teaching and working methods

Instruction consists of lectures, lessons and field trips. The course is also strongly linked to the course Design of Biotechnical Process and Production Systems, Project Course.
In the project course the students,in groups of two to three people, relate the different parts of the course Biotechnological production systems and the course literature for a specific type of biotech industry. The course literature is generic and can be applied to several types of production and operations. The aim of the project is, based on the course Biotechnological production system point of view, that the participants will use the knowledge provided through the lectures and course literature to immerse themselves in a certain type of biotech industry or company. The choice of the biotech industry is made by the participants themselves in dialogue with the course coordinator. The project gives students the opportunity to develop different abilities and skills related to engineering by practicing different roles in the work of the project. The project is reported orally continuously during the course and with a final oral presentation and written report.

For students following the master profile Industrial Biotechnology and Production, this course should be taken the same semester as TFTB32.

Examination

TEN1	Written examination	6 credits	U, 3, 4, 5

Grades

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

Department

Institutionen för ekonomisk och industriell utveckling

Director of Studies or equivalent

Mats Björkman

Examiner

Mats Björkman

Course website and other links

http://www.iei.liu.se/indprod/grundutbildning?l=sv

Education components

Preliminary scheduled hours: 44 h
Recommended self-study hours: 116 h

Course literature

Slack, N., Chambers, S., Johnston, R., Operations Management, Prentice Hall/Pearson Education

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.