

**SYLLABUS**

# **Bioprocess Engineering 7.5 credits B7003K**

**Bioprosessteknik**

**Course syllabus admitted: Autumn 2023 Sp 1 - Present**

DECISION DATE  
**2014-06-13**

# Bioprocess Engineering 7.5 credits B7003K

## Bioprosessteknik

### Second cycle, B7003K

Education level	Grade scale	Subject	Subject group (SCB)
Second cycle	G U 3 4 5	Kemisk apparatteknik	Chemical Engineering

### Main field of study

Chemical Engineering

## Entry requirements

Basic principles of physics and chemistry. Mathematics through differentil equations. Transport processes, Unit operation. Corresponding to the courses K0016K Chemical principles, B0007K Organic Chemistry and Biochemistry, B0003K Transport Processes, B0004K Unit Operations and F0004T Fysik 1.

## Selection

The selection is based on 30-285 credits

## Course Aim

The course will give the students an introduction to industrial bio-engineering and also give skills in the use of microorganisms in bio-engineering production systems. After completion of the course students will be able to:

- describe theoretical concepts within bioprocess engineering.
- describe and clarify enzymes\' basic functions and their significance in biochemical processes.
- describe central metabolic reaction pathways and in addition explain the cells energy turnover.
- describe which factors direct microbial cell growth and product structure and in addition complete equations for this.
- describe bioreactors mathematically.
- manage and design bioreactors.
- describe and explain various processes for product extraction and cleaning.
- describe normal existing large scale bioprocesses.
- carry out, evaluate and record experimental bio-engineering work.

## Contents

The course consists primarily of the following topics:

Industrial microbiology  
Microbial metabolism  
Fermentation operation  
Design and control of bioreactors  
Processes for product extraction

## Realization

Each course occasion\'s language and form is stated and appear on the course page on Luleå University of Technology's website.

The course consists of lectures, calculation examples and laboratories. In the lectures the theory regarding the chosen modules will be discussed. During the calculation practice, example problems will be solved and the concepts discussed in the theory section will be illustrated. The laboratories illustrate key elements from the lectures and will give students practical experience in fermentation operation.

## Examination

If there is a decision on special educational support, in accordance with the Guideline Student's rights and obligations at Luleå University of Technology, an adapted or alternative form of examination can be provided. The examination will encompass the course material. Students who have failed an examination on five occasions will not be allowed further resits.

## Unauthorized aids during exams and assessments

If a student, by using unauthorized aids, tries to mislead during an exam or when a study performance is to be assessed, disciplinary measures may be taken. The term "unauthorized aids" refers to aids that the teacher has not previously specified as permissible aids and that may assist in solving the examination task. This means that all aids not specified as permissible are prohibited. The Swedish version has interpretative precedence in the event of a conflict.

## Remarks

The course B7003K is equal to KGB008  
The course is given on an advanced level as part of the specialisation Chemical and Biochemical Process Engineering on the Master's programme Chemical Engineering Design.  
Study guide can be found in Fronter in the current course room.

## Transition terms

2500

## Course offered by

Department of Civil, Environmental and Natural Resources Engineering

## Modules

Code	Description	Grade scale	Cr	Status	From period	Title
0001	Written exam	G U 3 4 5	6	Mandatory	A07	
0002	Laboratory work	U G#	1.5	Mandatory	A07	

## Last revised

by Eva Gunneriusson 2014-06-13

## Syllabus established

Course plan approved by the Department of Chemical Engineering and Geosciences 2007-02-28.