



# BB2460 Biocatalysis 7.5 credits

## Biokatalys

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

This course plan is valid from Fall 2021.

## Grading scale

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

## Education cycle

Second cycle

## Main field of study

Biotechnology

## Specific prerequisites

### **Admission requirements for programme students at KTH:**

At least 150 credits from grades 1, 2 and 3 of which at least 100 credits from years 1 and 2, and bachelor's work must be completed. The 150 credits should include a minimum of 20 credits of Chemistry, 6 credits of Biochemistry, Biotechnology or Molecular Biology.

### **Admission requirements for independent students:**

A total of 6 university credits (hp) in Biochemistry, Biotechnology or Molecular Biology. 20 credits of Chemistry, Documented proficiency in English corresponding to English B.

## Language of instruction

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

## Intended learning outcomes

After passing the course, the student should be able to:

- demonstrate in-depth knowledge and analytical skills in the field of biocatalysis
- exploit and apply knowledge from basic biotechnology and chemistry courses to design environmentally sustainable enzymatic processes for industrial production of chemical products.
- formulate and discuss how biocatalysis can be applied in industry to create more environmentally sustainable biotechnological and chemical processes and, to reflect on sustainable societal development

## Course contents

The course gives an introduction to and an overview of the Biocatalysis field. It provides theoretical knowledge about the environmentally sustainable technical usage of enzymes for the production of high-value chemical products and it covers various enzyme classes with the focus on enzyme reaction mechanisms and usage in chemical processing. The course describes important experimental techniques such as using enzymes in non-aqueous media, employing enzyme cascades and methods to optimize the stereochemical outcome of the reactions. Several industrial processes are discussed as examples. The course also covers current strategies for enzyme engineering and modification of enzymes for catalytic applications.

## Examination

- LAB1 - Laboratory work, 1.5 credits, grading scale: P, F
- TEN1 - Written exam, 4.5 credits, grading scale: A, B, C, D, E, FX, F
- ÖVN1 - Exercises and seminarium, 1.5 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.

## Other requirements for final grade

The requirement for a final grade is grade E or above on TEN1 and ÖVN1 and grade P on LAB1.

The final grade will be calculated from 75% based on the written examination and 25% based on the grade on the project assignment. If the written examination gave an F then the final

grade is F independently of the grade of the project assignment. The grade on the project assignment can increase the final grade one step, not more.

The grade on the project assignment will not give a final grade lower than the grade on the written examination.

## **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.