

BIOENG-430

Introduction to cellular and molecular biotechnology

Zufferey Romain

Cursus	Sem.	Type
Biotechnology minor	H	Opt.
Ing.-chim.	MA1, MA3	Opt.

Language of teaching	English
Credits	2
Session	Winter
Semester	Fall
Exam	Written
Workload	60h
Weeks	14
Hours	2 weekly
Courses	2 weekly
Number of positions	

Summary

The course presents comparatively several topics at the interface between bioengineering and chemical engineering. Special emphasis is put on biocatalysis to reduce both the costs and the environmental impact of production processes.

Content

This lecture reviews the various facets of contemporary biotechnology. Numerous examples of applications related to medicine, the pharma industry, agriculture, and environmental issues will be presented. The molecular and cellular biology underlying these applications will be explained. Several practical examples will be discussed : the development and use of biocatalysts to reduce the environmental impact of production processes will be discussed in depth.

Keywords

Biotechnology, gene expression, trasngenesis, biocatalysis, green chemistry.

Learning Outcomes

By the end of the course, the student must be able to:

- Explain the mechanisms of gene expression
- Explain the properties and advantages of biotatalysis
- Compare and contrast biocatalysis with all the other types of catalysis
- Apply algorithms to solves life sciences related questions
- Analyze raw experimental data relataed to life sciences and draw from them the right conclusions
- Analyze and compare the environmental impact of 2 production processes

Transversal skills

- Communicate effectively with professionals from other disciplines.

Teaching methods

Lectures.

Expected student activities

In addition to attendance to the lectures, two weekly hours of personnal work are expected.

Assessment methods

Written exam.

Supervision

Office hours	Yes
Assistants	No
Forum	No

Resources**Bibliography**

Chapters from books available at the EPFL library will be recommended for motivated students.

Notes/Handbook

The lectures slides will be available on the Moodle site.

Moodle Link

- <http://moodle.epfl.ch/course/view.php?id=11631>