BB2560 Advanced Microbiology and Metagenomics 7.5 credits

Avancerad mikrobiologi och metagenomik

This is a translation of the Swedish, legally binding, course syllabus.

Establishment

Course syllabus for BB2560 valid from Spring 2020

Grading scale

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

Education cycle

Second cycle

Main field of study

Biotechnology

Specific prerequisites

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 shall demonstrate profound understanding of selected microbial ecosystems and be able to design experiments and use meta-analysis in different microbiology applications. The specific learning objectives are to be able to:

- Explain and investigate the roles of microbes in natural ecosystems
- Explain the roles of the human microbiota in health and disease
- Describe how metagenomics can be used to diagnose environmental and human health
- Discuss the societal and scientific challenges with antimicrobial resistance
- Plan and conduct a microbial community analysis, including a full work-flow from sampling to DNA extraction and in silico data analysis, with discussion of safe sample handling and ethical concerns,
- Explain how metagenomics can be used for enzyme discovery.

Course contents

Recent years have seen an explosion of large datasets generated on microbial communities in natural and industrial environments, thanks to advances in metagenomics and related technologies. These new data can give insight into human health and disease, or the fitness of a natural environment. In addition, these data can inform biotechnological interventions into the microbiota for improved digestion or food production, or can be a source of new industrially relevant enzymes.
The course will cover five key themes:

T1. Introduction to microbial communities and metagenomics

T2. Microbes in nature - oceans, lakes and soil

T3. The human microbiome

T4. Antimicrobial resistance

T5. Enzyme discovery through meta-omics

Examination

- ÖVN1 - Exercise, 1.0 credits, grading scale: P, F
- TEN1 - Written exam, 4.0 credits, grading scale: A, B, C, D, E, FX, F
- LAB1 - Laboratory course, 2.5 credits, grading scale: P, 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.

If the course is discontinued, students may request to be examined during the following two academic years.

Some lectures will be mandatory as they will involve student assessment tasks. Students who are unable to attend these compulsory lectures will be asked to submit alternative written assignments.

Other requirements for final grade

Students are required to PASS the LAB1 assignment (lab report) and to PASS the in-class exercises (OVN1) in order to pass the course. Students are also required to PASS the final exam (TEN1) to pass the course.
The final grade a student achieves is determined by their result on TEN1.

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.