UNIVERSITY OF BORÅS

Microbiology and Its Industrial Applications
Mikrobiologi och dess industriella tillämpningar
7.5 credits

Ladok Code: A535TA
Version: 2.0
Established by: Committee for Education in Technology 2023-10-06
Valid from: Spring 2024

Education Cycle: Second cycle
Main Field of Study (Progressive Specialisation): Resource Recovery (A1N)
Disciplinary Domain: Technology
Prerequisites: Admitted to the Master's Programme in Resource Recovery - Biotechnology and Bioeconomy
Subject Area: Biotechnology
Grading Scale: Seven-degree grading scale (A-F)

Content
The course gives students an overview of microbiology, biochemistry, and biotechnology and basic knowledge about microorganisms and enzymes used in industrial processes. Particular attention is paid to microorganisms such as fungi and yeast for fermentation in, for example, food production, bacteria and archaea in anaerobic digestion for waste recycling and role of microorganisms in waste water treatment. Practical experiments are carried out in the laboratory where students also learn to handle various instruments, tools, and techniques used in the field.

Learning Outcomes
After completing and passing the course, the student will be able to:

Knowledge and understanding
1.1 describe the basics of microbiology with a focus on bacteria, yeast ,and fungi,
1.2 explain the structure and function of important biomolecules and their metabolisms,
1.3 describe how microorganisms and enzymes are used in the industrial production of chemicals, fuels, and food.

Skills and abilities
2.1 analyse growth rates during fermentation of bacteria, yeast, and fungi in liquid and solid state systems,
2.2 perform and evaluate batch, lab-scale anaerobic digestion experiments with mixed microorganisms,
2.3 master the basics of biotechnology laboratory techniques and be able to handle certain instruments,
2.4 critically review and evaluate results from laboratory sessions,
2.5 independently acquire knowledge from the literature to understand microbiology and biochemistry,
2.6 select suitable microorganisms for different biotechnological processes.

Forms of Teaching
The teaching consists of lectures and laboratory sessions.

The language of instruction is English.

Forms of Examination
The course will be examined through the following examination elements:

Written exam
Learning outcomes:
Credits: 3.5
Gradingscale: Seven-degree grading scale (A-F)

Laboratories
Learning outcomes:
Credits: 2.5
Gradingscale: Fail (U) or Pass (G)

Laboratory reports
Learning outcomes:
Credits: 1.5
Gradingscale: Fail (U) or Pass (G)

The course is assessed with the grades A / B / C / D / E / Fx / F. To get an E or higher grade on the course, all parts of the examination must be passed / E or better. The final grade for the course is determined through a written exam.

If the student has received a decision/recommendation regarding special pedagogical support from the University of Borås due to disability or special needs, the examiner has the right to make accommodations when it comes to examination. The examiner must, based on the objectives of the course syllabus, determine whether the examination can be adapted in accordance with the decision/recommendation.

Student rights and obligations at examination are in accordance with guidelines and rules for the University of Borås.

Literature and Other Teaching Materials

Student Influence and Evaluation

The course is evaluated in accordance with current guidelines for course evaluations at the University of Borås in which students' views are to be gathered. The course evaluation report is published and returned to participating and prospective students in accordance with the above-mentioned guidelines, and will be taken into consideration in the future development of courses and education programmes. Course coordinators are responsible for ensuring that the evaluations are conducted as described above.

Miscellaneous

The course is a programme course for the Master's programme Resource Recovery- Biotechnology and Bioeconomics.

This syllabus is a translation from the Swedish original.