

Microbiology for Resource Scientists: Lecture (I002530)

Course size *(nominal values; actual values may depend on programme)*

Credits 3.0 **Study time** 90 h **Contact hrs** 30.0h

Course offerings in academic year 2022-2023

A (Year) English Gent

Lecturers in academic year 2022-2023

Schlömann, Michael FREIBE01 lecturer-in-charge

Offered in the following programmes in 2022-2023

	crdts	offering
International Master of Science in Sustainable and Innovative Natural Resource Management	3	A

Teaching languages

English

Keywords

Position of the course

Contents

Eukaryotic versus prokaryotic cell; important biomolecules (carbohydrates, lipids, proteins, nucleic acids); Basics of fundamental cell processes (replication, transcription, translation); structure of the microbial cell, microbial taxonomy and phylogeny; growth of microorganisms; principles of energy metabolism; microbial activities in the carbon cycle: energy metabolism on the example of aerobic degradation of carbohydrates; simple fermentations; aerobic degradation of alkanes; CO₂ fixation in photosynthetic and lithotrophic microorganisms; activities in the nitrogen cycle (nitrification, denitrification, N₂ fixation); microbial iron oxidation and reduction; microbial oxidation and reduction of sulfur compounds.

Initial competences

Background in general, inorganic and organic chemistry; high school knowledge in biology

Final competences

Students will have obtained a basic understanding of the functioning of a microbial cell. Specifically they will have obtained an understanding of the diversity of microbial energy metabolism, of the effects of microbial activities on the environment and how that can be used for the winning of metals and oil and for mine-water treatment. Students understand how microorganisms are classified into certain taxa, and they will have some insight into molecular tools for the classification and for the prediction of properties of the microorganisms.

Conditions for credit contract

This course unit cannot be taken via a credit contract

Conditions for exam contract

This course unit cannot be taken via an exam contract

Teaching methods

Extra information on the teaching methods

S1 (WS): All main topics are also covered in the German lecture "Grundlagen der Biochemie und Mikrobiologie" which is available online and will be subtitled in English. (E-learning platform: OPAL) / Lectures (2 SWS)

Learning materials and price

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References

Madigan, Martinko, Stahl, Clark: Brock - Microbiology Reineke & Schlömann: Umweltmikrobiologie

Course content-related study coaching

Assessment moments

Examination methods in case of periodic assessment during the first examination period

Examination methods in case of periodic assessment during the second examination period

Examination methods in case of permanent assessment

Possibilities of retake in case of permanent assessment

examination during the second examination period is possible

Extra information on the examination methods

For the award of credit points it is necessary to pass the module exam.

Calculation of the examination mark