

Challenges of Deep and High Stress Mining (1002409)

Due to Covid 19, the education and evaluation methods may vary from the information displayed in the schedules and course details. Any changes will be communicated on Ufora.

Course size *(nominal values; actual values may depend on programme)*
Credits 5.0 **Study time** 150 h **Contact hrs** 45.0 h

Course offerings in academic year 2022-2023

A (semester 1) English Gent

Lecturers in academic year 2022-2023

Durrheim, Raymond UPPSALOT lecturer-in-charge

Offered in the following programmes in 2022-2023

	crdts	offering
International Master of Science in Sustainable and Innovative Natural Resource Management	5	A

Teaching languages

English

Keywords

Position of the course

Contents

Deep mining will become common in the future as coal and mineral resources at shallow depths gradually become exhausted. Projections of global demand and supply of minerals and metals over the next century and resulting need for additional deep mining. Overview of current deep mining activities around the globe. Rock mechanics and stress calculations, overburden pressures and stress fields, induced seismicity. Identification of seismogenic structures. Catastrophic events seen in deep mining engineering: rockbursts, gas outbursts, high in situ and redistributed stresses, large deformation, squeezing and creeping rocks, and high temperature. Strategies for preventing or limiting such mining hazards. Increasing depth and rock temperatures, ventilation and cooling requirements. Air pressure changes and impacts on miners and instruments. Conditions for suitable work environments and how to achieve them deep underground. Development of automated mining technology and possibilities of automation.

Initial competences

Final competences

- On completion of the course the student shall be able to:
- demonstrate proficient consideration and treatment of mining challenges imposed by rock mechanics, seismicity, etc.
 - provide informed insight into work environment hazards arising from increasing depth, such as ventilation, temperature control, explosive gas detection and other factors affecting miners.
 - critically assess technical and skill requirements necessary for practical and safe deep mining operations
 - evaluate economic challenges and environmental hazards of proposed mining plans in deep and high stress environments

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

Lectures, seminars, case studies and practical exercises.

Learning materials and price

References

Course content-related study coaching

Evaluation methods

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

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

Examination methods in case of permanent evaluation

Possibilities of retake in case of permanent evaluation

not applicable

Extra information on the examination methods

Hand-in exercises (2 hp), active participation in group work and seminar presentation (1 hp),
written examination (2 hp).

Calculation of the examination mark