

## Challenges of Deep and High Stress Mining (1002409)

Due to Covid 19, the education and assessment 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** 45.0h

**Course offerings in academic year 2021-2022**

A (semester 1)      English      Gent

**Lecturers in academic year 2021-2022**

Durrheim, Raymond      UPPSAL01      lecturer-in-charge

**Offered in the following programmes in 2021-2022**

	crdts	offering
<a href="#">International Master of Science in Sustainable and Innovative Natural Resource Management</a>	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****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**

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**