



## SAFETY FOR DEEP MINES!

A continuously growing demand for minerals and metals together with the exhaustion of shallow high quality mineral deposits has forced mining activities to progress deeper into the earth crust.

Mining activities at great depths are subjected to the effects of high rock pressures and rock temperatures. Excessive damage of mining excavations, increased rock fall hazard and rockbursts threaten the safety of mine workers, the economy of mining operations and the extraction of mineral deposits.

Much progress has been made in the understanding of the mechanical behaviour of rock, the design and support of rock structures and stoping systems. Tools to analyse the rock pressure situation in mines have been developed, support systems to maintain the integrity of mining excavations under extreme rock pressure situations are available and instrumentation to monitor stable and unstable rock deformation exists.

What is badly lacking is qualified and well-trained rock engineering personnel required by mines, mining authorities, mining engineering consulting groups and universities to deal with the rock pressure problems in a structured and professional manner.

## A STRONG PARTNERSHIP OF EXPERTS

SafeDeepMining is a joint effort by the following universities:

- » Montanuniversität Leoben (MUL), Austria Consortium Leader
- » Clausthal University of Technology (CUT), Germany
- » Silesian University of Technology (SUT) Gliwice, Poland
- » Technische Universität Bergakademie Freiberg (TU-BAF), Germany

and the following organisations and mines:

- » GEODATA-Group: Supplier of monitoring hardware and engineering services, Leoben, Austria
- » KGHM Cuprum Ltd Research and Development Centre, Poland
- » Wolfram Bergbau und Hütten AG, Tungsten mine Mittersill, Austria
- » ZAMG: Research Institute of the Austrian Federal Ministry of Education, Science and Research, with responsibility for weather forecasts and seismology, Vienna, Austria

with support from:

- » University of Pretoria (UP), South Africa
- » RHI Magnesita, Magnesite Mine Breitenau, Austria

The individual modules will be run and administered by the universities responsible for the modules.

Graduates of this certified university program for further education are awarded the academic title „Rock Engineer for Deep Mines“ by Montanuniversität LEOBEN.



supported by:



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# SafeDeepMining

## Advanced Rock Engineering Education for Deep Mines



 This activity has received funding from the European Institute of Innovation and Technology (EIT), a body of the European Union, under the Horizon 2020, the EU Framework Programme for Research and Innovation



## A SUCCESSFUL PARTICIPANT WILL BE ABLE TO:

- » identify existing and likely future rock pressure problems;
- » analyse rock pressure problems;
- » train mining personnel to recognize hazardous rock fall situations and to take the appropriate support measures;
- » select the correct support method and design of support system or where required to develop and introduce new support systems;
- » evaluate mine design from a rock pressure point of view and where necessary modify or replace it with more appropriate designs;
- » evaluate the mining method from the rock pressure point of view and to modify or change it, where necessary;
- » examine the mining sequence and change it where necessary;
- » assist in the implementation of the proposed solution to the rock pressure problems;
- » monitor the effectiveness of measures adopted to eliminate or minimize the rock pressure problems;
- » review the rock pressure situation on an on-going basis.

## STRUCTURE OF THE PROGRAMME

- » Eight compulsory and four elective modules (out of which participants have to select three).
- » Duration of modules: one week on-site plus approx one week of online courses.
- » Assignments dealing with specific rock engineering problems have to be completed by participants between course modules.
- » Emphasis is on the application of rock engineering principles in the mining industry in order to make deep mining operations safer and more efficient. The focus of the programme is to provide the participants with the basic knowledge and skills required to address and solve practical rock engineering problems.

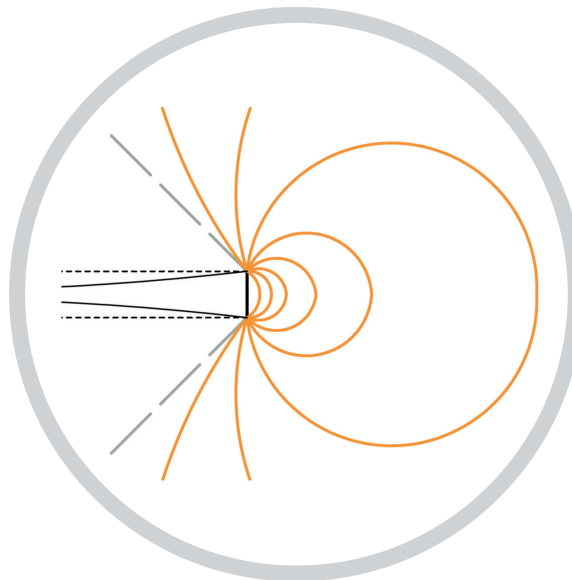
## DURATION AND FEES

Duration of first course:

9 weeks on site, during October 2019 – November 2020; plus approx. 9 weeks of online courses.

The fee for the initial two-year course will be covered by EIT RawMaterials, including costs of a comprehensive set of lecture notes, supervision of assignments, laboratory and field work, as well as refreshments during course work.

The rates for subsequent courses will be market-oriented.



## TARGET GROUP

This programme is specifically directed at:

- » mining engineers
- » governmental organisations responsible for supervision of mining activities
- » public authorities
- » consulting companies in the field of mining, having to deal with rock pressure problems
- » personnel employed in the mining industry
- » geologists

## REQUIREMENTS

General university entrance qualification, or BSc in mining, geotechnical engineering, geology, mine surveying, or persons with extensive practical experience in the area of mine planning, mine support and supervision of mining activities in difficult ground conditions.

Minimum TOEFL score of 80 or minimum IELTS level of 6.0.

## CONTACT FOR FURTHER DETAILS & APPLICATION:

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APPLICATION DEADLINE:  
15 September 2019  
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