NORDIC MINING SCHOOL (NMS) FOR ADVANCED EXTRACTIVE TECHNOLOGY AND NATURAL RESOURCE MANAGEMENT
A joint Luleå University of Technology and Oulu University initiative

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BACKGROUND
The Bothnian Bay region has a strong infrastructure for mining and minerals technology development with large possibilities for further development. The region has two technical universities with 30,000 students, more than 3000 researchers and teachers, and 350 professors; a large number of successful high-tech companies, small one-man upstarts as well as major international mining and MTS companies (Mining Technology Service); a number of science parks, national competence centres and an innovation-oriented public sector. In short, the region has an excellent environment to establish state of the art education within advanced mining and mineral technology, and stimulate new knowledge within areas where Sweden and Finland are competitive on a global scale.

To enhance this innovative environment Luleå University of Technology and Oulu University have jointly set up a powerful Nordic competence centre for exploration, mining, minerals processing and metallurgical education called the NORDIC MINING SCHOOL. The centre should focus on:

- Improve the quality in education primarily at a masters level
- Stimulate contacts, remove borders and make mobility between Sweden and Finland easier
- Play an important role for the development and integration of new business partnerships in the region
- Make the joint university environment in the region more attractive, also for international students
- Attract further resources to the universities

The Nordic Mining School is funded for 3 years by Interreg IVa Nord, the two universities, Länsstyrelsen Norrbotten and Pohjois-Pohjanmaan liitto.
GOALS
The main tasks of the school would be to:
1. Increase the cooperation within education between Luleå University of Technology and Oulu University – as well as the cooperation with industry, governments and other organisations in the region
2. Highlight Northern Fennoscandia as a significant science region in ore geology, mining engineering, minerals engineering, and metallurgy
3. Increase the quality and efficiency among the participating institutions by opening up courses, libraries and other facilities to masters students, teachers and researchers, and establish new joint strategies in education and research

ACTIVITIES OF THE CENTRE
Luleå University of Technology and Oulu University will develop interregional cooperation within:
- Education (masters level and potentially post graduate level)
- Innovations/technology transfer
- Research

The educational part will form the basis for the school where the curriculum in mining engineering, rock mechanics, mineral processing, metallurgy, exploration and environmental geosciences at masters level offered in english will be opened up for students at both universities. By combining the two universities curriculum we will offer a masters level programme within exploration, mining, metallurgy and environment that is among the strongest in Europe. The ambition is that this will attract also international students to the region and strengthen the local industry by providing highly skilled local students for the labour market.

The students will spend minimum 6 months of their 2 years masters programme at the university at which they are not enrolled. We will work on joint diploma and joint/double degrees for these students which will further increase the attractiveness of the universities and the masters programmes included in the mining school.

Beside the cooperation in education the NORDIC MINING SCHOOL also will introduce the concept of “mineral entrepreneurship” into the masters programme for the first time in the Nordic countries. This will be achieved by recruiting a joint professor for both universities, also as far as we know for the first time in the Nordic counties. The professor will also be responsible to build a Finnish-Swedish research group that should be developed together with the Nordic industry. The ambition is that this research group will after 3 years be self sufficient with research funds for PhD-students and research projects in the Nordic and international realm. By introducing the concept of mineral entrepreneurship it is anticipated that the students graduating from the school will have a good knowledge in business processes directly related to the mineral and mining industry.

LOCALISATION OF THE SCHOOL
The school would be located at the two universities. It will be built up with the help of existing infrastructures and competences of the two universities. The various cooperation efforts within the school would take place mainly at faculty and departmental level and be formalised through agreements.

**ORGANISATION**
A joint board and organisation should be set up to lead and administrate the cooperation. The board/steering committee will consist of one professor and one student from each university and 3 representatives from industry. The school administration will be organised through a 50% position at each university. The administrators should be teachers with a good knowledge of mining and metallurgical education.

_The Administration Office_
The day to day work will be managed by a joint administration office hosted at both universities. The administration office will also provide service for the steering committee and be responsible for all the other activities in the name of the Nordic Centre for Advanced Extractive Technology and Natural Resource Management. The administration office is the joint executive body and responsible for co-ordinating all joint courses and curriculum. This body is also responsible for promotional activities and outreach, for instance running a joint web page.

The tasks of the Administration office are to:
- Develop and evaluate the education at the joint programs, the joint courses and the joint degrees at the Nordic School for Advanced Extractive Technology and Natural Resource Management
- Prepare proposals for general strategies for the education at the Nordic School for Advanced Extractive Technology and Natural Resource Management
- Coordinate the cooperation between the different education and subjects at the centre
- Take initiatives in matters concerning education at the school.

_The Student Union Committee_
The student unions at the two universities will have a cooperation body which also will appoint the students representatives for the board/steering group.

_The Board/Steering Group_
The Board/Steering Group is the formal decision body for educational programmes and other activities in the School. It is also the contact point with industry. A chairman will be appointed to lead the steering group. The chairman will be appointed by the rectors.

**JOINT PROFESSORSHIP**
To manifest the cooperation we propose that a joint professor in "Mineral entrepreneurship and business processes" should be established. The main task of the joint professor would be to lead the work and build up the organisation and activities of the centre, and develop an innovative environment and an efficient commercialisation structure that will enhance a global branding of the Bothnian Bay region as a high-tech region for mining and mineral processing technology. It is anticipated that the professor one year after the installation will have a 7.5 ECTS course prepared at an advanced level in mineral entrepreneurship and business processes. This course should also be offered to all PhD-students in relevant fields at both universities.
MOBILITY
The school will promote the mobility between the two universities through the joint coordination office which will organise information sessions for students and teachers, provide information materials etc. Further information will be gathered on a special web page for the school. To support the mobility of the students and teachers between Luleå University of Technology and Oulu University we propose that a system will be set up between the two universities based on the Socrates Erasmus Student Mobility Grant¹ and the NOVA-Nordplus mobility grant². Organisation of accommodation will be a part of the tasks for the administrators.

¹ Erasmus is a European-funded student mobility scheme which is part of Socrates, the European Community education programme. It is based on partnerships between higher education institutions in different countries in the European Union. Students may receive a grant towards their costs. The grants are intended to offset the additional costs of mobility, such as travel costs, foreign language preparation where necessary and a higher cost of living in the host country.

² The Nordic Council of Ministers established the Nordplus program in 1988 as a mobility- and co-operation program for students and teachers in higher education in the Nordic countries. The program has three specific goals, namely to support and
Besides mobility, enhanced and improved modules in distant learning will be set up at the universities. Both universities have a long experience and are leading universities on a national level. We will utilise this expertise to establish a cross-border distant learning system. This is a challenge mainly because software is presently adapted for domestic use. High speed connection between the universities must be established so that real time AV-connections works smoothly.

**COURSES**
A joint curriculum will be offered at a masters level. The teaching language will be English. Students should stay for periods of minimum 6 month at the sister university. During a phasing in period students will be offered shorter modules based on the ECTS system. It is also anticipated that teachers will move to offer modules at the sister university. We will also utilise distant learning systems which are well developed at each university. One task will be to connect hardware and software across the border. An evaluation of the possibility of double and joint degrees will constitute an important task for the first year of the school in the school.

**RESEARCH PROJECTS**
As a further possibility when the school is established (as a post proposal activity) joint efforts regarding research projects would be developed.

**NAME OF THE SCHOOL**
The name of the school should communicate a high-tech and modern sector in an international environment. We propose that the name of the school will be "The Nordic Mining (NMS) school for Advanced Extractive Technology and Natural Resource Management".

**NORWEGIAN INCOOPORATION**
Norwegian involvement will be evaluated as a post-project possibility, due to current limitations in curriculums at Norwegian universities within the Interreg IVA region.

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Intensify Nordic co-operation within higher education and to increase student and teacher mobility. The Nordplus program awards: 1) student and teaching staff mobility grants, 2) grants for planning and running intensive courses, for developing joint study programmes and other network activities, 3) network support.