Attachment no. 1 to Programme of Education

Education/Learning Outcomes for the main field of study

(Assumed educational effects)

Faculty: Geoengineering, Mining, and Geology
Main field of study: mining and geology
Education level: 2nd magister studies
Profile: general academic
Specialization: Underground and Surface Mining

Description of symbols/Legend
K – education/learning outcome for the main field of study
W – category of knowledge
U – category of skills
K (after an underscore) – category of social competences
OT –education/learning outcome for the education area of technical sciences
01, 02, 03 and further – number of education/learning outcome
2 – second level studies
A – general academic profile

Education/ learning outcome for 2nd level studies in the main field of study (K)	DESCRIPTION OF THE MAIN-FIELD-OF-STUDY EDUCATION/LEARNING OTCOMES On completion the 2nd level studies in the field of mining and geology a graduate:	Correlation with education/ learning outcomes for the education area in the field of technical sciences (OT)
KNOWLEDGE		
K_W01	has fundamental knowledge of the methods of the geostatistical analysis of deposit parameters and their possible applications	OT2A_W01
K_W02	has broadened and deepened knowledge of physics embracing the fundamentals of quantum physics and the physics of the solid state necessary to understand the physical phenomena of essential influence on the matter properties	OT2A_W01
K_W03	has systematised knowledge of the stress state changes within the rock mass induced by underground mining and their mathematical definition and description	OT2A_W01 OT2A_W03
K_W04	has the state-of-the-art knowledge of the world and local mineral resources, geophysical and drilling methods for their prospecting, exploration and recognition and the	OT2A_W02

	computer assistance to exploratory works	
K_W05	has the state-of-the-art knowledge of the surface mining technologies and machinery systems	OT2A_W03 OT2A_W04
K_W06	has knowledge of the basic decision models in the management created by means of computer programs	OT2A_W09
K_W07	has knowledge of the mine designing related to technology, technics, organisation and environment (including Occupational Safety and Health regulations) with the use of CAD/CAM tools	OT2A_W03 OT2A_W07
K_W08	has knowledge of the machinery systems applied to raw material technologies and their operational reliability	OT2A_W04 OT2A_W07
K_W09	has knowledge of the construction and function of underground mining plants, the hazards to mining operations and the methods for their limitation and suppression	OT2A_W03
K_W10	has knowledge of the mining-induced changes of a rock mass with special regard to the mining impact on the ground surface and the methods of monitoring of such the changes in order to allow the ground surface protection	OT2A_W04 OT2A_W07
K_W11	has knowledge of the possible application of geotechnics to assess the phenomena of the decisive influence on the stability of rock mass around excavations (open pits), slopes (dumps) and underground mining workings and tunnels	OT2A_W03
K_W12	has fundamental knowledge of the automation and control of technological processes	OT2A_W02
K_W13	has knowledge related to the methods and tools for design, calculations and optimisation of the useful mineral and waste processing systems with the use of the mathematical modelling and digital simulation of technological operations	OT2A_W03 OT2A_W04
K_W14	knows the geological and mining law sufficiently for ascertaining their professional qualifications to practise the regulated mining professions as a member of the of supervisory management team of the mining plant operations and especially to run the mining operations being exposed to natural hazards	OT2A_W08
K_W15	has knowledge related to the systems of the environment control and management using information tools in Poland and in EU countries	OT2A_W09
K_W16	has knowledge and theoretical grounding related to the methods for the ventilation network designing and the climatic conditions controlling in underground mines	OT2A_W03 OT2A_W07
K_W17	has fundamental knowledge of the role and fundamental principles of the finance management	OT2A_W01 OT2A_W08 OT2A_W09
K_W18	has knowledge of the methodological and technical basics of the occupational risk assessment in the light of the Polish and international law; has knowledge related to the basics of the organisation and management of work safety	OT2A_W08

	necessary for the managerial and supervisory staff in mining industry	
K_W19	has fundamental knowledge necessary to understand the social and psychological factors of the engineering activity	OT2A_W08
SKILLS		
K_U01	has language skills in scientific disciplines, the field and specialization of study related to the studied discipline and is able to use the specialization language to communicate in their professional environment using various techniques in the field of the studied discipline; understands their specialization literature in a foreign language and is able to interpret it, draw conclusions, obtain necessary information, carry out critical analysis and assess; is able to read and comprehend professional literature, business and technical documentation (catalogues of products, operation manuals of equipment and tools, computer programs etc.); is able, in a foreign language, to prepare a well-documented study (e.g. a short scientific report with the results of own research) or present the description of equipment, products of a company, technological problems etc.; is able to formulate and justify opinions in full, prepare and give an oral presentation concerning problems related to the studied discipline and topics connected with the work environment and also take part in scientific and professional discussions	OT2A_U01 OT2A_U03
K_U02	uses a foreign language understood by a home speaker and is able to communicate in speaking and writing in everyday life; has elementary foreign language skills such as: understands simple spoken and written formulations, is able to make social relations, talk coherently about the well-known subject, can write an e-mail, postcard or note; distinguishes and uses to some extent the formal and informal aspect of a foreign language; uses their basic social and cultural knowledge while communicating in a given language	OT2A_U01 OT2A_U03
K_U03	understands quite well the content and intentions of a speech or text on the well-known everyday-life or professional subject; is able to write a short text about the well-known topic, including a practical one (e.g. an informal letter); is able to take part in talks about known subjects and to some extent talk about their studies and professional work using their social and cultural knowledge	OT2A_U01 OT2A_U03
K_U04	is able to develop the spatial variability model of a deposit parameter and use it to design (to plan) the deposit exploitation	OT2A_U08 OT2A_U09
K_U05	is able to formulate the failure prediction of underground mining workings and select and design the appropriate	OT2A_U09 OT2A_U19

	support protecting the workings	
K_U06	is able to interpret the results of seismic investigations and develop the simplified project of the exploratory borehole	OT2A_U08
K_U07	is able to design the technological processes of surface mining of clastic rocks and blocks of compact rocks	OT2A_U07
K_U08	is able to use and interpret the basic decision models by means of computer programs	OT2A_U07 OT2A_U14
K_U09	is able to use the tools of the computer assistance to the deposit modelling and the mine designing in accordance with the world standards	OT2A_U07 OT2A_U09 OT2A_U11
K_U10	is able make the 2D technical documentation with the use of computer-aided design programs (CAD)	OT2A_U07
K_U11	is able to make decisions on the selection, equipment and exploitation of the machines in surface and underground mining	OT2A_U15
K_U12	is able to design the mining district of the mining plant including the cost-effectiveness analysis of production	OT2A_U11 OT2A_U14
K_U13	is able to design the measurement and control network for the monitoring of the rock mass changes in the areas of mining exploitation and the appropriate operations protecting the ground surface	OT2A_U11 OT2A_U19
K_U14	is able to design the support for the mining working and analyse the slope stability	OT2A_U11 OT2A_U19
K_U15	knows the rules of control of the electric engine start and work; is able to examine the relay and the isolation automatic control systems in mining	OT2A_U15
K_U16	is able to program the basic models/algorithms of processing operations and use them to analyse the effectiveness of the complex system of ore, rock or waste processing	OT2A_U19
K_U17	is able to formulate general rules of carrying out the rescue works; is able to use the principles of the development of the rescue, first aid and fire-fighting plan; is able to use the computer system to assist fire-fighting operations	OT2A_U13
K_U18	is able to use the methods and appropriate information tools in the management systems of environment components	OT2A_U07
K_U19	is able to design the air-conditioning and make the heat balance for the mining district	OT2A_U10 OT2A_U19
K_U20	is able to interpret data included in the enterprise financial reports, analyse the enterprise financial situation, develop the simple financial model and use the sophisticated methods of the investment effectiveness assessment	OT2A_U01 OT2A_U14
K_U21	is able to assess by themself the occupational risk for the selected work environment factors with the use of computer tools; is able to work out by themselves parts of the work safety documentation required by the regulations of geological and mining law	OT2A_U07 OT2A_U13

SOCIAL COMPETENCES		
K_K01	is able to think and act in a creative and entrepreneurial way	OT2A_K04 OT2A_K05
K_K02	understands the need to formulate information and opinions concerning achievements in mining engineering and other aspects of a mining engineer activity and share them with the society, among other means, through mass media; makes efforts to share the information and opinions in an understandable way, presenting them from different points of view; realises the value of and the need to form the safety culture in the workplace and the responsibility for the health and life of all the other employees in the mining industry	OT2A_K06 OT2A_K07