



Module name: Rudiments of Mining

Academic year: 2019/2020 Code: GIGR-2-101-ME-s ECTS credits: 4

Faculty of: Mining and Geoengineering

Field of study: Mining Engineering Specialty: Mining Engineering

Study level: Second-cycle studies Form and type of study: Full-time studies

Lecture language: English Profile of education: Academic (A) Semester: 1

Course homepage: —

Responsible teacher: prof. nadzw. dr hab. inż. Korzeniowski Waldemar (walkor@agh.edu.pl)

Module summary

Role of mining for the global economy. Geological characterisation of orebodies in relation to potential mining technology. Scope and various types of mining activity. Typical mining equipment and their application. Mining and natural threats associating thje technology. Examples of different mines ideas.

Description of learning outcomes for module

MLO code	Student after module completion has the knowledge/ knows how to/is able to	Connections with FLO	Method of learning outcomes verification (form of completion)
Social competence: is able to			
M_K001	The student understands the need for continuous updating and expanding knowledge in the field of underground exploitation.	IGR2A_K01, IGR2A_K03, IGR2A_K04, IGR2A_K02	Activity during classes, Test
M_K002	The student understands the need for continuous updating and expanding knowledge in the field of underground exploitation in the conditions of natural hazards.	IGR2A_K01, IGR2A_K03, IGR2A_K04, IGR2A_K02	Activity during classes, Examination, Test, Oral answer, Presentation, Report, Case study, Participation in a discussion, Execution of exercises
Skills: he can			
M_U001	The student can describe and interpret mining and geological conditions on the basis of which can design an appropriate system of exploitation.	IGR2A_U05, IGR2A_U03, IGR2A_U01, IGR2A_U02	Activity during classes, Test

M_U002	The student is able to perform the project of deposit exploitation.	IGR2A_W03, IGR2A_W02, IGR2A_W01	Activity during classes, Test
Knowledge: he knows and understands			
M_W001	The student has basic knowledge in the interpretation of mining and geological conditions on the basis of which can design an appropriate system of exploitation.	IGR2A_W03, IGR2A_W02, IGR2A_W01	Activity during classes, Test
M_W002	The student has basic knowledge in the interpretation of mining and geological conditions on the basis of which can design an appropriate support system.	IGR2A_W04, IGR2A_W06, IGR2A_W05, IGR2A_W03, IGR2A_W02, IGR2A_W01	Activity during classes, Examination, Test, Oral answer, Presentation, Project, Case study, Participation in a discussion, Execution of exercises, Involvement in teamwork

Number of hours for each form of classes

Suma	Form of classes										
	Lectures	Auditorium classes	Laboratory classes	Project classes	Conversation seminar	Seminar classes	Practical classes	Fieldwork classes	Workshops	Prace kontrolne i przejściowe	Lektorat
45	30	0	0	15	0	0	0	0	0	0	0

FLO matrix in relation to forms of classes

MLO code	Student after module completion has the knowledge/ knows how to/is able to	Form of classes										
		Lectures	Auditorium classes	Laboratory classes	Project classes	Conversation seminar	Seminar classes	Practical classes	Fieldwork classes	Workshops	Prace kontrolne i przejściowe	Lektorat
Social competence: is able to												
M_K001	The student understands the need for continuous updating and expanding knowledge in the field of underground exploitation.	+	-	-	+	-	-	-	-	-	-	-
M_K002	The student understands the need for continuous updating and expanding knowledge in the field of underground exploitation in the conditions of natural hazards.	+	-	-	+	-	-	-	-	-	-	-
Skills: he can												

M_U001	The student can describe and interpret mining and geological conditions on the basis of which can design an appropriate system of exploitation.	+	-	-	+	-	-	-	-	-	-	-
M_U002	The student is able to perform the project of deposit exploitation.	+	-	-	+	-	-	-	-	-	-	-
Knowledge: he knows and understands												
M_W001	The student has basic knowledge in the interpretation of mining and geological conditions on the basis of which can design an appropriate system of exploitation.	+	-	-	+	-	-	-	-	-	-	-
M_W002	The student has basic knowledge in the interpretation of mining and geological conditions on the basis of which can design an appropriate support system.	+	-	-	+	-	-	-	-	-	-	-

Student workload (ECTS credits balance)

Student activity form	Student workload
Udział w zajęciach dydaktycznych/praktyka	45 h
Preparation for classes	14 h
przygotowanie projektu, prezentacji, pracy pisemnej, sprawozdania	14 h
Realization of independently performed tasks	28 h
Examination or Final test	2 h
Contact hours	1 h
Summary student workload	104 h
Module ECTS credits	4 ECTS

Additional information

Module content

Lectures

Raw minerals in ecosystem, classification according to industrial demand.
 Rock and rock-mass properties influencing selection of underground technology.
 Geological and geometrical parameters of mineral deposits and their role for technology.
 Geological reserves, classification, cut-off grade.
 Cutting, excavating, winning and drilling techniques utilized underground.
 Types and use of underground excavations, roof support, lining and einforcement

methods.

Models of underground mines, infrastructure.

Back filling technologies.

Natural threats and prophylactics, environmental impact.

Underground space for civil utilization.

Project classes

An example of development of the regular orebody. Determination of the main technological parameters of the deposit exploitation (eg. resources, daily output and progress, the number of the indicative roof, surface deformation indexes) and choice of the equipment in longwall panel caving in particular shearer loader, armoured face conveyor and powered roof support.

Teaching methods and techniques:

Lectures: Treści prezentowane na wykładzie są przekazywane w formie prezentacji multimedialnej w połączeniu z klasycznym wykładem tablicowym wzbogaconymi o pokazy odnoszące się do prezentowanych zagadnień.

Project classes: Studenci wykonują zadany projekt samodzielnie, bez większej ingerencji prowadzącego. Ma to wykształcić poczucie odpowiedzialności za pracę w grupie oraz odpowiedzialności za podejmowane decyzje.

Warunki i sposób zaliczenia poszczególnych form zajęć, w tym zasady zaliczeń poprawkowych, a także warunki dopuszczenia do egzaminu:

Examination after positive pass of the project.

Zasady udziału w poszczególnych zajęciach, ze wskazaniem, czy obecność studenta na zajęciach jest obowiązkowa:

Lectures:

- Attendance is mandatory: No

- Participation rules in classes: Studenci uczestniczą w zajęciach poznając kolejne treści nauczania zgodnie z sylabusem przedmiotu. Studenci winni na bieżąco zadawać pytania i wyjaśniać wątpliwości. Rejestracja audiowizualna wykładu wymaga zgody prowadzącego.

Project classes:

- Attendance is mandatory: Yes

- Participation rules in classes: Studenci wykonują prace praktyczne mające na celu uzyskanie kompetencji zakładanych przez sylabus. Ocenie podlega sposób wykonania projektu oraz efekt końcowy.

Method of calculating the final grade

The final grade is a weighted average rating of the exam (weight 0.6) and classes (weight 0.4).

Sposób i tryb wyrównywania zaległości powstałych wskutek nieobecności studenta na zajęciach:

Late project or individual consulting.

Prerequisites and additional requirements

Fundamentals of geology

Recommended literature and teaching resources

1. Piechota S.: Technika podziemnej eksploatacji złóż i likwidacji kopalń. AGH Uczelniane Wydawnictwa Naukowo - Dydaktyczne, Kraków 2008.
2. Hustrulid W.A., Bullock R.L.: Underground Mining Methods: Engineering Fundamentals and

International Case Studies, SME 2001.

Scientific publications of module course instructors related to the topic of the module

1. Korzeniowski W.: Evaluation of state of underground gateroads and rooms based on empirical research methods. AGH Uczelniane Wydawnictwa Naukowo-Dydaktyczne, Kraków, 2006.
2. Korzeniowski W., Skrzypkowski K.: Comparative investigations of the load capacity and load-strain characteristics of chocks with different filling. Polish Mining Review, 4/2012.
3. Korzeniowski W., Skrzypkowski K.: Laboratory method for evaluating the characteristics of expansion rock bolts subjected to axial tension. Archives of Mining Sciences, 2015, vol. 60 no. 1, s. 209-224.

Additional information

The absence of the classes can be made up for by performing additional tasks.