

**AGH**AGH UNIVERSITY OF SCIENCE
AND TECHNOLOGY

Module name: Mining & Reclamation

Academic year: 2019/2020 Code: GBUD-2-326-RM-s ECTS credits: 3

Faculty of: Mining and Geoengineering

Field of study: Civil Engineering Specialty: Renovation and modernization of buildings

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

Lecture language: English Profile of education: Academic (A) Semester: 3

Course homepage: —

Responsible teacher: dr hab. inż, prof. AGH Ostręga Anna (ostrega@agh.edu.pl)

Module summary

The aim of the subject is to familiarize students with specifics of mining operations and their influence into the environment as well as methods of post-mining land reclamation and possibilities for its target use (revitalisation).

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 | Is ready to initiate get involved in the processes of reclamation of post-mining areas. | BUD2A_K02 | Execution of a project, Case study, Participation in a discussion |
| M_K002 | Is ready to expand and complete acquired knowledge and lifelong learning. | BUD2A_K01 | Execution of a project, Participation in a discussion, Case study |
| Skills: he can | | | |
| M_U001 | Can elaborate the concept of the revitalisation of the post-mining land based on the analysis of conditions. | BUD2A_U04 | Execution of a project, Participation in a discussion, Case study |
| M_U002 | Can define the scope of technical and biological reclamation on the basis of revitalisation concept. | BUD2A_U04 | Execution of a project, Participation in a discussion, Case study |
| Knowledge: he knows and understands | | | |

| | | | |
|--------|--|-----------|---|
| M_W001 | Knows and understands specifics of mining operations and their influence into the environment. | BUD2A_W02 | Execution of a project, Participation in a discussion, Case study |
| M_W002 | Knows and understands methods of post-mining land reclamation and possibilities for its target use (revitalisation). | BUD2A_W02 | Execution of a project, Participation in a discussion, Case study |

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 |
| 30 | 15 | 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 | Is ready to initiate get involved in the processes of reclamation of post-mining areas. | + | - | - | + | - | - | - | - | - | - | - |
| M_K002 | Is ready to expand and complete acquired knowledge and lifelong learning. | + | - | - | + | - | - | - | - | - | - | - |
| Skills: he can | | | | | | | | | | | | |
| M_U001 | Can elaborate the concept of the revitalisation of the post-mining land based on the analysis of conditions. | - | - | - | + | - | - | - | - | - | - | - |
| M_U002 | Can define the scope of technical and biological reclamation on the basis of revitalisation concept. | - | - | - | + | - | - | - | - | - | - | - |
| Knowledge: he knows and understands | | | | | | | | | | | | |
| M_W001 | Knows and understands specifics of mining operations and their influence into the environment. | + | - | - | - | - | - | - | - | - | - | - |

| | | | | | | | | | | | | |
|--------|--|---|---|---|---|---|---|---|---|---|---|---|
| M_W002 | Knows and understands methods of post-mining land reclamation and possibilities for its target use (revitalisation). | + | - | - | - | - | - | - | - | - | - | - |
|--------|--|---|---|---|---|---|---|---|---|---|---|---|

Student workload (ECTS credits balance)

| Student activity form | Student workload |
|---|------------------|
| Udział w zajęciach dydaktycznych/praktyka | 30 h |
| przygotowanie projektu, prezentacji, pracy pisemnej, sprawozdania | 20 h |
| Realization of independently performed tasks | 25 h |
| Contact hours | 1 h |
| Summary student workload | 76 h |
| Module ECTS credits | 3 ECTS |

Additional information

Module content

Lectures

- 1) Introduction and definitions. Mining in Poland and EU. Acceptance of mining activity in driftnet countries – Social Licence to Operate.
- 2) Types of mining activity and their influence into the environment.
- 3) Responsibility in the mine-closure, reclamation, redevelopment and revitalisation processes. The scope and mutual relations between these activities.
- 4) Stages of reclamation: initial, technical, biological. Methods of post-mining land reclamation. The role of plants in reclamation. Fitoremediation and phytomining.
- 5) Legal basis of the mining and reclamation activities.
- 6) Financial sources of mine-closure and reclamation.
- 7) Examples of opportunities for mining-related reclamation and reuse (forest, agricultural, natural, water, recreational, educational, cultural, economic, etc.).

Project classes

Elaborate the concept of the revitalisation of the post-mining land based on the analysis of conditions and then define the scope of technical and biological reclamation. Calculating the costs of technical and biological reclamation. Basic vocabulary of mining terms especially mining equipment, mining processes, mining objects and mining reclamation.

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: Podczas zajęć audytoryjnych studenci na tablicy rozwiązują zadane wcześniej problemy. Prowadzący na bieżąco dokonuje stosowanych wyjaśnień i moderuje dyskusję z grupą nad danym problemem.

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

Project elaboration and knowledge of specialist terminology.

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

Lectures:

- Attendance is mandatory: Yes

- 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 przystępując do ćwiczeń są zobowiązani do przygotowania się w zakresie wskazanym każdorazowo przez prowadzącego (np. w formie zestawów zadań). Ocena pracy studenta może bazować na wypowiedziach ustnych lub pisemnych w formie kolokwium, co zgodnie z regulaminem studiów AGH przekłada się na ocenę końcową z tej formy zajęć.

Method of calculating the final grade

Assessment of the project.

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

Absence in class can be made up by performing part of the project on a different date.

Prerequisites and additional requirements

none

Recommended literature and teaching resources

1. Krzaklewski W. (2014): The succession method in reclamation activity, [in:] Geotechnische und Umweltaspekte bei der Rekultivierung und Revitalisierung von Bergbaufolgelandschaften in Polen und in Deutschland (Geotechnical and environmental aspects of reclamation and revitalisation of post-mining areas in Poland and Germany) (ed. Cała M., von Bismarck F., Illing M.), AGH Press, Kraków, pp. 326-388, (in GER and PL).
2. Lemoine G. (2010): Restoration and protection of post-mining landscapes for environmental value and for public access in the Département du Nord (France), 2. Internationaler Bergbau und Umwelt Sanierungs Congress, 1-3 September 2010, Dresden.
3. Cała M., von Bismarck F., Illing M. (ed.) (2014): Geotechnische und Umweltaspekte bei der Rekultivierung und Revitalisierung von Bergbaufolgelandschaften in Polen und in Deutschland (Geotechnical and environmental aspects of reclamation and revitalisation of post-mining areas in Poland and Germany). AGH Press, 2014 (in GER and PL).

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

1. Uberman R., Ostreęga A. 2007: Mineral Policy in Poland. Mining Manual. AGH University of Science and Technology Press, Kraków.
2. Cała M., Ostreęga A. (2013), Geotechnical Aspects of Revitalisation of Post-Mining Areas – An Example of the Adaptation of Katowice Hard Coal Mine for the New Silesian Museum. Archives of Mining Science, vol. 58, no. 2, s. 361-374.
3. Uberman R., Ostreęga A. 2009: Prawne procedury postępowania dla uzyskania koncesji na odkrywkową eksploatację złóż. Górnictwo Odkrywkowe nr 2-3, s. 58-64.
4. Uberman R., Ostreęga A. 2004: Sposoby rekultywacji i zagospodarowania zwałowisk nadkładu i składowisk odpadów górniczych. Górnictwo Odkrywkowe, nr 7-8, s. 80-87.
5. Ostreęga A., Uberman R. 2009: Ranking of Lignite Deposits in Poland Established on the Basis of the Analytic Hierarchy Process. The Tenth International Symposium on the Analytic Hierarchy Process, ISAHP 2009. The University of Pittsburgh, Katz Graduate School of Business in Pittsburgh, Pennsylvania,

USA 29 lipiec – 1 sierpień 2009. Wersja elektroniczna referatu.

6.Uberman R., Czaja P., Ostreęga A. 2010: Mining and reclamation in Poland. 2. Internationaler Bergbau und Umwelt Sanierungs Congress, 1-3 September 2010, Dresden. Publikacja w materiałach konferencyjnych.

7.Ostreęga A., Uberman R. 2010: Kierunki rekultywacji i zagospodarowania – sposób wyboru, klasyfikacja i przykłady. *Górnictwo i Geoinżynieria* R. 34, z. 4, s. 445-461.

8.Ostreęga A., Uberman R., Stożek Ł., Muzykiewicz B.: Koncepcja rekultywacji i docelowego zagospodarowania kopalni wapienia „Kujawy”. *Górnictwo i Geologia* XV. Prace Naukowe Instytutu Górnictwa Politechniki Wrocławskiej nr 132, *Studia i Materiały* nr 39; Oficyna Wydawnicza Politechniki Wrocławskiej, 2011; s. 223-224.

9.Ostreęga A., Teodorski D., Becker R. 2012: Regeneration of post-industrial facilities in the Legnica-Głogów Copper Mining District illustrated with an example of “Obora” Filling Sand Mine. *AGH Journal of Mining and Geoengineering*, vol. 36, no. 2, s. 259-268.

10.Uberman R., Ostreęga A. 2012: Reclamation and revitalisation of lands after mining activities. Polish achievements and problems. *AGH Journal of Mining and Geoengineering*, vol. 36, no. 2, s. 285-297.

11.Ostreęga A. 2013: Organizacyjno-finansowe modele rewitalizacji w regionach górniczych. Wydawnictwa AGH. Seria rozprawy i monografie, nr 279 Kraków.

12. Cała M. (ed), Ostreęga et al. (2013): Mining waste management in the Baltic Sea Region: Min-Novation project. AGH Press, Kraków, pp. 263.

Additional information

no