1. **Course title:** LIQUIDATION OF MINE WORKINGS

2. **Course code:** SI-EZIZO/46

3. **Validity of course description:** 2015/2016

4. **Level of studies:** BSc programme / 1\textsuperscript{st} cycle of higher education

5. **Mode of studies:** intramural studies

6. **Field of study:** MINING & GEOLOGY (FACULTY SYMBOL) RG

7. **Profile of studies:** general academic

8. **Programme:** MINING TECHNOLOGIES AND WASTE MANAGEMENT

9. **Semester:** VII

10. **Faculty teaching the course:** Institute of Mining Technology

11. **Course instructor:** Rafał Jendruś PhD

12. **Course classification:** Specialty courses

13. **Course status:** compulsory

14. **Language of instruction:** English

15. **Pre-requisite qualifications:**

   The main pre-requisite course is: General Mining. Student should possess overall knowledge in the field of underground and opencast mining systems, metal ore mining and quarrying.

16. **Course objectives:**

   Objective of the course is obtainment by the student a knowledge in the field of mines closure and liquidation of workings. Development of abilities to solve simple engineering problems related to mentioned subject.

17. **Description of learning outcomes:**

<table>
<thead>
<tr>
<th>Nr</th>
<th>Learning outcomes description</th>
<th>Method of assessment</th>
<th>Teaching methods</th>
<th>Learning outcomes reference code</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Possess knowledge on the liquidation of mine workings and closure of mines, also with use of industrial waste.</td>
<td>Written colloquium</td>
<td>Lecture</td>
<td>K_W28+++</td>
</tr>
<tr>
<td>2</td>
<td>Is able to design and conduct measurements of such parameters as density, spread, and strength of materials used in hydraulic backfill and grouting of voids, is able to interpret the results and go into appropriate conclusions.</td>
<td>Written colloquium/Single-handedly elaborated calculations</td>
<td>Lecture/classes</td>
<td>K_U02++ K_U03+++ K_U06+ K_U23+++</td>
</tr>
<tr>
<td>3</td>
<td>Is able to identify and solve properly, accordingly to engineering rules problems related to performed work.</td>
<td>Written colloquium/positive evaluation of the project</td>
<td>Lecture/Project</td>
<td>K_K05++</td>
</tr>
</tbody>
</table>

18. **Teaching modes and hours**

   **Lecture / MA Seminar / Class / Project / Laboratory**

   Sem 7: Lecture 15 h., Class – 15 h, Project - 15 h

19. **Syllabus description:**

   **Semester 7 :**

   **Lecture:** Principles of mine workings and shaft treatment; Mine backfill types; Backfill properties; Mining methods with backfill and caving; Grouting of goab area; System layout – design criteria; Backfill slurry – hydraulic fill and pipeline system; Case studies.
**Class:** Examples of computing in the field of excavation and disposal of mines, including the liquidation of the shaft

**Project:** Conceptual design of the liquidation shaft calculations and develop detailed design solutions for specific issues. Implementation of a detailed schedule including the liquidation pit, pipe shaft, the head of the shaft, the shaft and the stromal area of surface infrastructure. To introduce the concept of ventilation shaft at the time of its liquidation and control of methane. To introduce the concept of monitoring the liquidation of the shaft.

20. **Examination:** semester 7

21. **Primary sources:**

22. **Secondary sources:**
   2. Norm PN-93/G-11010 Mining - "hydraulic filling materials - Requirements and test methods".

23. **Total workload required to achieve learning outcomes**

<table>
<thead>
<tr>
<th>Lp.</th>
<th>Teaching mode</th>
<th>Contact hours / Student workload hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Lecture</td>
<td>15/25 – including literature study (10h), preparation for the exam (10h), and exam (5h)</td>
</tr>
<tr>
<td>2</td>
<td>Classes</td>
<td>15/20 – including calculations (10h) and participation in consultancy (10h)</td>
</tr>
<tr>
<td>3</td>
<td>Laboratory</td>
<td>/</td>
</tr>
<tr>
<td>4</td>
<td>Project</td>
<td>15/30 – including elaboration of the project (20h) and participation in consultancy (10h)</td>
</tr>
<tr>
<td>5</td>
<td>BA/ MA Seminar</td>
<td>/</td>
</tr>
<tr>
<td>6</td>
<td>Other</td>
<td>/</td>
</tr>
<tr>
<td></td>
<td>Total number of hours</td>
<td>45/75</td>
</tr>
</tbody>
</table>

24. **Total hours:** 120

25. **Number of ECTS credits:** 4

26. **Number of ECTS credits allocated for contact hours:** 2

27. **Number of ECTS credits allocated for in-practice hours (laboratory classes, projects):** 2

26. **Comments:**

Approved:

______________________________  ________________________________
(date, Instructor’s signature)   (date, the Director of the Faculty Unit signature)