## 1. Course title: UTILIZATION OF WASTE MATERIALS

## 2. Course code: S II-GGiP/22


### 4. Level of studies: MSc programme

### 5. Mode of studies: intramural studies

### 6. Field of study: mining and geology (RG)

### 7. Profile of studies: general academic

### 8. Programme: mining and exploring geology

### 9. Semester: 3

### 10. Faculty teaching the course: Institute of Applied Geology

### 11. Course instructor: dr hab. Zdzisław Adamczyk, prof. nzw. w Pol. Śl.

### 12. Course classification: speciality course

### 13. Course status: compulsory

### 14. Language of instruction: English, Polish

### 15. Pre-requisite qualifications: Mineralogy and petrology, Environmental geochemistry, Methods of minerals and rocks investigations, Technical mineralogy

### 16. Course objectives:

The aim of the course is to study utilization methods of wastes from the industry and municipal structures and their possible influence on the environment with regard to law conditions

### 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>Student has ordered, theoretically based knowledge in the field of methods of mineral raw materials processing and waste material utilization, including their influence on the environment</td>
<td>written test, laboratory report</td>
<td>Lecture, laboratory</td>
<td>K_W13+++</td>
</tr>
<tr>
<td>2</td>
<td>Student knows the Polish environmental law and administrative procedures connected with the use of the environment during geological works and mining activity</td>
<td>written test, laboratory report</td>
<td>Lecture, laboratory</td>
<td>K_W14+</td>
</tr>
<tr>
<td>3</td>
<td>Student manages, when formulating and solving engineering tasks in the field of mining and geology, to integrate knowledge and to apply system approach, taking into account non-technical aspects</td>
<td>written test</td>
<td>Lecture</td>
<td>K_U09++</td>
</tr>
<tr>
<td>4</td>
<td>Student manages to formulate and solve engineering tasks and simple investigative problems and to test corresponding hypotheses using analytical methods and computer simulatory methods</td>
<td>laboratory report</td>
<td>Laboratory</td>
<td>K_U10++</td>
</tr>
<tr>
<td>5</td>
<td>Student manages to prognose the formation of technical minerals and optimize processing conditions to reduce the environmental impact</td>
<td>written test</td>
<td>Lecture, laboratory</td>
<td>K_U18+++</td>
</tr>
<tr>
<td>6</td>
<td>Student is conscious of and understands non-technical aspects and effects of engineering activity, environmental impact including, and understands responsibility for undertaken decisions connected with it</td>
<td>written test</td>
<td>Lecture</td>
<td>K_K02+++</td>
</tr>
</tbody>
</table>

### 18. Teaching modes and hours

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

| 30 | 15 |
19. Syllabus description:

Lecture

Laboratory
Determination of the environmental influence of waste materials from the mining industry, metallurgy and power plants by elution test.

20. Examination: No

21. Primary sources:
1. Rosik-Dulewska C. - Podstawy gospodarki odpadami. PWN Warszawa 2010
4. Piecuch T. - Termiczna utylizacja odpadów i ochrona powietrza przed szkodliwymi składnikami spalin. Wydawnictwo Uczelniane Politechniki Koszalińskiej


22. Secondary sources:

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>30/5</td>
</tr>
<tr>
<td>2</td>
<td>Classes</td>
<td>-/-</td>
</tr>
<tr>
<td>3</td>
<td>Laboratory</td>
<td>15/10</td>
</tr>
<tr>
<td>4</td>
<td>Project</td>
<td>-/-</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>45/15</td>
</tr>
</tbody>
</table>

24. Total hours: 60

25. Number of ECTS credits: 2

26. Number of ECTS credits allocated for contact hours: 1

27. Number of ECTS credits allocated for in-practice hours (laboratory classes, projects): 1

26. Comments:

Approved:

(date, Instructor’s signature)  …………………………………………………………….
(date, the Director of the Faculty Unit signature)