1. Course title: DRILLING

2. Course code: S I – MGBD/35

3. Validity of course description: 2017/2018

4. Level of studies: 1st cycle of higher education

5. Mode of studies: intramural studies

6. Field of study: MINING AND GEOLOGY (RG)

7. Profile of studies: academic profile

8. Programme: Mining, Construction and Road-making Machinery

9. Semester: V

10. Faculty teaching the course: Faculty of Mining and Geology, Department of Mining Mechanization and Robotisation

11. Course instructor: Eryk Remiorz, Ph.D.

12. Course classification: other

13. Course status: compulsory

14. Language of instruction: English

15. Pre-requisite qualifications: Theoretical mechanics, Mechanics of materials, Engineering drawing, Basics of machine design

16. Course objectives: The objective of this course is to provide knowledge about the application of technical solutions and drilling technologies in mining.

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>The student has general knowledge in the field of design, technology, construction and operation of drilling machinery and equipment</td>
<td>written test</td>
<td>lecture</td>
<td>K_W17+++</td>
</tr>
<tr>
<td>2.</td>
<td>The student has knowledge of electric, pneumatic and hydraulic drives of selected drilling machines</td>
<td>test or assessment of a given task</td>
<td>laboratory</td>
<td>K_W19++</td>
</tr>
<tr>
<td>3.</td>
<td>Student can acquire information from professional literature, databases, technical documentation and other sources, is able to integrate gained information and draw conclusions, can formulate and justify opinions</td>
<td>test or assessment of a given task</td>
<td>laboratory</td>
<td>K_U01+</td>
</tr>
<tr>
<td>4.</td>
<td>The student is able to critically analyze and evaluate the functioning of the existing drilling machines and technologies</td>
<td>test or assessment of a given task</td>
<td>laboratory</td>
<td>K_U18+</td>
</tr>
<tr>
<td>5.</td>
<td>The student can select drilling tools for drilling machines and drilling rigs</td>
<td>test or assessment of a given task</td>
<td>laboratory</td>
<td>K_U23+++</td>
</tr>
<tr>
<td>6.</td>
<td>Student is aware of the importance and understanding of non-technical aspects and impacts of drilling, including its environmental impact, and consequently the responsibility for decisions</td>
<td>written test</td>
<td>lecture</td>
<td>K_K02+</td>
</tr>
</tbody>
</table>

18. Teaching modes and hours

Lecture 15 h, Laboratory 30 h

19. Syllabus description:

Lectures:
The aim and methods of use of drilling. Application of drilling in underground mining and other industries. Elementary definitions, main elements and dimensions of the borehole, dimensions determining the position of the borehole axis in the ground, spatial mapping scheme of the straight borehole. Division of drilling machinery and equipment, drillings and boreholes. Rotary drilling rig. Methods to remove cuttings from the bottom and near-bottom zone of the borehole. Drilling fluid. The tasks of drilling mud in the process of drilling. Types of drilling fluids. Measurements in boreholes. The construction of boreholes.

Laboratory:
Drilling machines with electric, pneumatic and hydraulic drives. The selected constructions of drilling rigs used in coal mines. Rotary and percussive drilling rigs. Working tools of drilling machines and their selection for different rock. Working tools of drilling rigs. Drilling-bolting mobile
20. Examination: No

21. Primary sources:
3. PN–92/G–01201 – Wiertnictwo. Terminologia

22. Secondary sources:
4. Informatory techniczne, katalogi, poradniki i prospekty – dotyczące narzędzi i maszyn wiertniczych – polskich producentów: KRÓLMET – FASING, FM GLINIK S.A. Gorlice, OMAG Oświęcim, ZMUW Sosnowiec i innych

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 / 35</td>
</tr>
<tr>
<td>2</td>
<td>Classes</td>
<td>/</td>
</tr>
<tr>
<td>3</td>
<td>Laboratory</td>
<td>30 / 40</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 / 75</td>
</tr>
</tbody>
</table>

24. Total hours: 120

25. Number of ECTS credits: 4

26. Number of ECTS credits allocated for contact hours: 4

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

28. Comments:

Approved:

………………………………………………………………………………………
(date, Instructor’s signature)

………………………………………………………………………………………
(date, the Director of the Faculty Unit signature)