**COURSE DESCRIPTION**

1. **Course title:** Applied Chemistry  
2. **Course code:** RB-S1-17-I09  
3. **Validity of course description:** 2017  
4. **Level of studies:** BSc programme  
5. **Mode of studies:** intramural studies  
6. **Field of study:** Civil Engineering  
7. **Profile of studies:** general  
8. **Programme:** 1) SE  
9. **Semester:** 1  
10. **Faculty teaching the course:** Department of Building Structures (RB2)  
11. **Course instructor:** dr inż. Andrzej Śliwka  
12. **Course classification:** other subjects  
13. **Course status:** obligatory subject  
14. **Language of instruction:** English  
15. **Pre-requisite qualifications:**  
   Mathematics, Physics  
16. **Course objectives:**  
   Consolidation of basic knowledge of chemistry with the addition of chemistry building materials topics, their properties and durability. Understanding and skill of description of the chemical processes. Acquiring skills of laboratory analysis.  
17. **Description of learning outcomes:**

<table>
<thead>
<tr>
<th>No</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>He has the knowledge from selected areas of chemistry that allows the description of the states of matter and the understanding of the fundamental chemical processes of importance in building, used to assess the suitability of building materials, methods for the safe handling and predict their durability.</td>
<td>colloquium</td>
<td>lecture</td>
<td>K1A_W19+++</td>
</tr>
</tbody>
</table>
| 2  | He knows the most commonly used materials and construction elements as well as the basis of technology for their production. | colloquium | lecture | K1A_W14++  
K1A_W12++ |
| 3  | He can perform simple experiments and laboratory observations leading to assess the quality of used building materials. | report, project defense | laboratory | K1A_U13+++ |
| 4  | He knows the properties of building materials and is able to experimentally assess their quality. | report, project defense | laboratory | K1A_U22++ |
| 5  | He is aware of the reliability of the results of their work and their interpretation. | report, project defense | laboratory | K1A_K02++ |

18. **Teaching modes and hours:**  
   lecture: 30, laboratory: 15,  
19. **Syllabus description:**  
   **Laboratory:** Chemical equations and stoichiometric calculations. PH test of concrete. Reconstruction of composition of hardened concrete. Determination of chloride content in concrete. Determining the risk of corrosion of reinforcing steel. Microscopic observations of binders the progress of the hydration of the plaster structure materials.
Chemical equations and stoichiometric calculations.
PH test of concrete.
Reconstruction of composition of hardened concrete.
Determination of chloride content in concrete.
Determining the risk of corrosion of reinforcing steel.
Microscopic observations of binders the progress of the hydration of the plaster structure materials.

20. Examination: no

21. Primary sources:
- Czarnecki L. i in.: „Chemia w budownictwie”. Arkady Warszawa 2000
- Kurdowski W.: „Chemia cementu i betonu”. Polski Cement Kraków 2010
- Kurdowski W.: „Chemia materiałów budowlanych”. AGH Kraków 2000
- Hermanowicz W. i in.: „Fizyczno-chemiczne badanie wody i ścieków”. Arkady Warszawa 1999

22. Secondary sources:
- Budniok A.: „Chemia Techniczna”. UŚ Katowice 1989
- Bolewski A. i in.: „Mineralogia Ogólna”. Wyd. Geologiczne 1975
- Praca zbiorowa: „Materials science and technology”. Wiley-VCH Verlag GmbH & Co. KGaA 2013 Online

23. Total workload required to achieve learning outcomes:

<table>
<thead>
<tr>
<th>No</th>
<th>Teaching mode</th>
<th>Hours</th>
<th>contact</th>
<th>student workload</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Participation in lectures</td>
<td>30</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Participation in laboratory</td>
<td>15</td>
<td></td>
<td>15</td>
</tr>
<tr>
<td>3</td>
<td>Participation in additional consultations</td>
<td>15</td>
<td></td>
<td>15</td>
</tr>
<tr>
<td>4</td>
<td>Own work of student on preparatory to exam, colloquium, etc.</td>
<td>0</td>
<td></td>
<td>31</td>
</tr>
<tr>
<td>5</td>
<td>Own work of student on preparatory to laboratory</td>
<td>0</td>
<td></td>
<td>10</td>
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<tr>
<td>6</td>
<td>Defense of the laboratory report, project etc.</td>
<td>2</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Participation of the student in knowledge checking (exam, test, etc.)</td>
<td>5</td>
<td>0</td>
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</tr>
<tr>
<td></td>
<td>Summary:</td>
<td>67</td>
<td>71</td>
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</tr>
</tbody>
</table>

24. Total hours: 108  (1 ECTS = 27 h, PO 19/14/15)

25. Number of ECTS credits: 4

26. Number of ECTS credits allocated for contact hours: 3

27. Number of ECTS credits allocated for in-practice hours: 3

28. Comments:
The final grade is a weighted average of the evaluation of the lectures (70%) and laboratory (30%)

1) shortened form of a speciality for the Civil Engineering: SE - Structural Engineering

__________________________________________  ______________________________
(date, Instructor's signature)  (date, the Director of Faculty Unit signature)