1. Course title: Foundation Engineering
2. Course code: RB-S1-15-W3C
3. Validity of course description: 2015
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: 5
10. Faculty teaching the course: Department of Geotechnics and Roads (RB7)
11. Course instructor: dr inż. Krzysztof Sternik
12. Course classification: common subjects
13. Course status: obligatory subject
14. Language of instruction: English
15. Pre-requisite qualifications:
   Soil Mechanics, Foundation Engineering sem. 4
16. Course objectives:
The purpose of the course is to learn various deep foundations and designing a pile foundation. Foundation in difficult subsoil conditions i.e. on expansive soils is also discussed. RC pile foundation design is the practical aspect of the course in the 5th semester.
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>Knowledge of deep foundation types</td>
<td>exam</td>
<td>lecture</td>
<td>K1A_W06+++ K1A_W08++</td>
</tr>
<tr>
<td>2</td>
<td>Knowledge of deep foundation design principles</td>
<td>exam</td>
<td>lecture</td>
<td>K1A_W06+++ K1A_W08++</td>
</tr>
<tr>
<td>3</td>
<td>Knowledge of principles and techniques for pile testing</td>
<td>exam</td>
<td>lecture</td>
<td>K1A_W06+++ K1A_W08++</td>
</tr>
<tr>
<td>4</td>
<td>Knowledge of design principles for foundations on expansive soils</td>
<td>exam</td>
<td>lecture</td>
<td>K1A_W06+++ K1A_W08++</td>
</tr>
<tr>
<td>5</td>
<td>Ability to design a simple pile foundation</td>
<td>oral defense of project, written project</td>
<td>project</td>
<td>K1A_U09++</td>
</tr>
<tr>
<td>6</td>
<td>Competence of being responsible for the design of a simple pile footing</td>
<td>oral defense of project, written project</td>
<td>project</td>
<td>K1A_K01+++ K1A_K02++</td>
</tr>
</tbody>
</table>

18. Teaching modes and hours:
   lecture: 15, classes: 2, project: 13,

19. Syllabus description:
Lecture: DEEP FOUNDATIONS INCLUDING DRILLED PIERS: Floating foundations, Settlements of compensated foundations, Underpinning, Excavation protection, Drilled piers
PILE FOUNDATIONS: Selection, Design, Placement
FIELD TESTING OF PILES
FOUNDATIONS ON EXPANSIVE SOILS: Identification of swelling soils, Application of heave predictions, Design of foundations, Basic considerations, Shallow individual or continuous footings, Reinforced slab-on-grade foundations, Deep foundations, Minimization of foundation movement

Classes: Introduction to pile foundation design. Presentation of all steps in the design: foundation depth, bearing capacity according to Eurocode 7, determination of stress distribution around a pile and group of piles in the subsoil, settlement analysis, reinforcement calculations, drawing.
### Project: Pile foundation design: ultimate and serviceability limit states according to EC7, reinforcement determination, drawing

#### 20. Examination:
no

#### 21. Primary sources:
- Pula O.: "Fundamenty palowe wg Eurokodu 7". DWE, 2013
- Polish Standard: "PN-81/B-03020 Posadowienie bezpośrednie budowli".
- Polish Standard: "PN-83/B-02482 Fundamenty budowlane. Nośność pali i fundamentów palowych".
- EN 1997-1: "Eurocode 7".

#### 22. Secondary sources:
- Das B.M.: "Principles of Foundation Engineering". Global Engineering, Christopher M. Schortt
- WWW: "http://environment.uwe.ac.uk/geocal/geoweb.htm".

#### 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>15</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>Participation in exercises</td>
<td>2</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>Participation in project classes</td>
<td>13</td>
<td></td>
<td>13</td>
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<tr>
<td>4</td>
<td>Participation in additional consultations</td>
<td>10</td>
<td></td>
<td>10</td>
</tr>
<tr>
<td>5</td>
<td>Own work of student on preparatory to exam, colloquium, etc.</td>
<td>0</td>
<td>26</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Own work of student on preparatory to project</td>
<td>0</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Defense of the laboratory report, project etc.</td>
<td>5</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

Summary: 45 61

#### 24. Total hours: 81  (1 ECTS = 27 h, PO 19/14/15)

#### 25. Number of ECTS credits: 3

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

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

#### 28. Comments: —

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

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