

# SYLLABUS <sup>1</sup>

## 1. Information about the program

|  |   |
|--|---|
| 1.1 Higher education institution                   | Politehnica University Timisoara  |
| 1.2 Faculty <sup>2</sup> / Department <sup>3</sup> | Civil Engineering Faculty/Department of Land Communication Ways, Foundations and Cadastre |
| 1.3 Chair  | —   |
| 1.4 Field of study (name/code <sup>4</sup> )       | Civil Engineering/80  |
| 1.5 Study cycle                                    | Bachelor  |
| 1.6 Study program (name/code/qualification)        | Civil Engineering in English/10/Engineer  |

## 2. Information about the discipline

|   |   |              |   |                        |   |                                     |    |
|---|---|--------------|---|------------------------|---|-------------------------------------|----|
| 2.1 Name of discipline/ formative category <sup>5</sup>     | Special Reinforced Concrete Structures /DS  |              |   |                        |   |                                     |    |
| 2.2 Coordinator (holder) of course activities               | Assoc. Prof. PhD. Eng. Boldurean Ioan Petru |              |   |                        |   |                                     |    |
| 2.3 Coordinator (holder) of applied activities <sup>6</sup> | Assoc. Prof. PhD. Eng. Boldurean Ioan Petru |              |   |                        |   |                                     |    |
| 2.4 Year of study <sup>7</sup>                              | IV  | 2.5 Semester | 7 | 2.6 Type of evaluation | D | 2.7 Type of discipline <sup>8</sup> | DO |

## 3. Total estimated time – hours / semester: direct teaching activities (fully assisted or partly assisted) and individual training activities (unassisted) <sup>9</sup>

|  |              |   |    |  |     |
|--|--------------|---|----|--|-----|
| 3.1 Number of fully assisted hours / week                | 4 of which:  | 3.2 course  | 2  | 3.3 seminar / laboratory / project         | 2   |
| 3.1* Total number of fully assisted hours / semester     | 56 of which: | 3.2* course   | 28 | 3.3* seminar / laboratory / project        | 28  |
| 3.4 Number of hours partially assisted / week            | of which:    | 3.5 training  |    | 3.6 hours for diploma project elaboration  |     |
| 3.4* Total number of hours partially assisted / semester | of which:    | 3.5* training   |    | 3.6* hours for diploma project elaboration |     |
| 3.7 Number of hours of unassisted activities / week      | 2 of which:  | additional documentary hours in the library, on the specialized electronic platforms and on the field |    |  | 0,5 |
|  |              | hours of individual study after manual, course support, bibliography and notes                        |    |  | 0,5 |
|  |              | training seminars / laboratories, homework and papers, portfolios and essays                          |    |  | 1   |
| 3.7* Number of hours of unassisted activities / semester | 28 of which: | additional documentary hours in the library, on the specialized electronic platforms and on the field |    |  | 7   |
|  |              | hours of individual study after manual, course support, bibliography and notes                        |    |  | 7   |
|  |              | training seminars / laboratories, homework and papers, portfolios and essays                          |    |  | 14  |
| 3.8 Total hours / week <sup>10</sup>                     | 6            |   |    |  |     |
| 3.8* Total hours /semester                               | 84           |   |    |  |     |
| 3.9 Number of credits                                    | 5            |   |    |  |     |

## 4. Prerequisites (where applicable)

|                |   |
|----------------|---|
| 4.1 Curriculum | <ul style="list-style-type: none"> <li>Soil Mechanics, Foundation Engineering, Reinforced Concrete</li> </ul> |
|----------------|---|

<sup>1</sup> The form corresponds to the Discipline File promoted by OMECTS 5703 / 18.12.2011 and to the requirements of the ARACIS Specific Standards valid from 01.10.2017.

<sup>2</sup> The name of the faculty which manages the educational curriculum to which the discipline belongs

<sup>3</sup> The name of the department entrusted with the discipline, and to which the course coordinator/holder belongs.

<sup>4</sup> The code provided in HG no.140 / 16.03.2017 or similar HGs updated annually shall be entered.

<sup>5</sup> Discipline falls under the educational curriculum in one of the following formative disciplines: Basic Discipline (DF), Domain Discipline (DD), Specialist Discipline (DS) or Complementary Discipline (DC).

<sup>6</sup> Application activities refer to: seminar (S) / laboratory (L) / project (P) / practice/training (Pr).

<sup>7</sup> Year of studies in which the discipline is provided in the curriculum.

<sup>8</sup> Discipline may have one of the following regimes: imposed discipline (DI), optional discipline (DO) or optional discipline (Df).

<sup>9</sup> The number of hours in the headings 3.1 \*, 3.2 \*, ..., 3.8 \* is obtained by multiplying by 14 (weeks) the number of hours in headings 3.1, 3.2, ..., 3.8. The information in sections 3.1, 3.4 and 3.7 is the verification keys used by ARACIS as: (3.1) + (3.4) ≥ 28 hours / wk. and (3.8) ≤ 40 hours / wk.

<sup>10</sup> The total number of hours / week is obtained by summing up the number of hours in points 3.1, 3.4 and 3.7.

|                  |  |
|------------------|--|
| 4.2 Competencies | <ul style="list-style-type: none"> <li>Using the scientific engineering and IT fundamentals</li> </ul> |
|------------------|--|

### 5. Conditions (where applicable)

|                                     |   |
|-------------------------------------|---|
| 5.1 of the course                   | <ul style="list-style-type: none"> <li>Classroom having 35 seats. Support materials: laptop, projector, screen, blackboard</li> </ul> |
| 5.2 to conduct practical activities | <ul style="list-style-type: none"> <li>Classroom having 35 seats. Support materials: laptop, projector, screen, blackboard</li> </ul> |

### 6. Specific competencies acquired through this discipline

|   |  |
|---|--|
| Specific competencies   | <ul style="list-style-type: none"> <li>Acquire knowledge about shallow and deep foundations for reinforced concrete structures</li> </ul>  |
| Professional competencies ascribed to the specific competencies | <ul style="list-style-type: none"> <li>Recognizing typical structures and structural elements, specific to the graduated study programme</li> <li>Design of structural elements in civil engineering, specific to graduated study programme</li> </ul> |
| Transversal competencies ascribed to the specific competencies  | <ul style="list-style-type: none"> <li>Documentation in Romanian and foreign language, in view of professional and personal development, via continuous learning and efficient adaptation to the new technical specifications</li> </ul>               |

### 7. Objectives of the discipline (based on the grid of specific competencies acquired - pct.6)

|   |   |
|---|---|
| 7.1 The general objective of the discipline | <ul style="list-style-type: none"> <li>It is pursued to get theoretical and practical knowledge for students in the field of execution technologies for infrastructure works.</li> <li>There are presented technologies for realizing shallow foundation systems and also, deep foundation systems, respectively pile foundation systems.</li> <li>Also, the lecture presents aspects regarding the soil's mechanical and physical properties before and after applying a mechanical improvement method.</li> </ul> |
| 7.2 Specific objectives                     | <ul style="list-style-type: none"> <li>After completion of the course students should be able to have the ability of recognizing and designing shallow and deep foundations for reinforced concrete structures.</li> <li>Also, the students must be able to analyze systems and technologies for improving weak foundation grounds by mechanical methods.</li> </ul>  |

### 8. Content <sup>11</sup>

| 8.1 Course  | Number of hours | Teaching methods <sup>12</sup> |
|---|-----------------|--------------------------------|
| Grid Foundations and Mat Foundations for Reinforced Concrete Structures | 2               | Lecturing, conversation,       |

<sup>11</sup> It details all the didactic activities foreseen in the curriculum (lectures and seminar themes, the list of laboratory works, the content of the stages of project preparation, the theme of each practice stage). The titles of the laboratory work carried out on the stands shall be accompanied by the notation "(\*)".

<sup>12</sup> Presentation of the teaching methods will include the use of new technologies (e-mail, personalized web page, electronic resources etc.).

|   |   |             |
|---|---|-------------|
| Deep Foundations – Piles, Bearing Capacity and Technology           | 2 | explanation |
| Improvement of the Soils' Bearing Capacity by Mechanical Compaction | 3 |             |
|   |   |             |
|   |   |             |
|   |   |             |
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Bibliography <sup>13</sup>

1. D.A. Greenwood, G.H. Thompson – Ground Stabilization: Deep Compaction and Grouting, ICE Works Construction Guides, Thomas Telford Ltd, London, UK, 1994
2. I. Smith – Smith's Elements of Soil Mechanics, 8<sup>th</sup> Edition, Blackwell Publishing, Oxford, UK, 2006
3. B.M. Das - Principles of Foundation Engineering, PWS-Kent, Boston, USA, 1990
4. L. Abramson, T. Lee, S. Sharma, G. Boyce – Slope Stability and Stabilization Methods, John Wiley & Sons, Inc., New York, USA, 2002

**8.2 Applied activities** <sup>14</sup>

|   | Number of hours | Teaching methods                                  |
|---|-----------------|---|
| Calculation and Distribution of the Applied Loads on a Grid Foundation and Calculus of the Stress Distribution of the Structure         | 2               | Explanation, example, test, questions, discussion |
| Calculus of the Bearing Capacity of One Pile, Methods and Technologies Used to Realize Piles  | 2               |   |
| Mechanical Methods for Improving the Bearing Capacity of Natural Soils (Mechanical Compaction, Intensive Compaction and Vibro-floating) | 3               |   |
|   |                 |   |
|   |                 |   |
|   |                 |   |
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Bibliography <sup>15</sup>

1. D.A. Greenwood, G.H. Thompson – Ground Stabilization: Deep Compaction and Grouting, ICE Works Construction Guides, Thomas Telford Ltd, London, UK, 1994
2. I. Smith – Smith's Elements of Soil Mechanics, 8<sup>th</sup> Edition, Blackwell Publishing, Oxford, UK, 2006
3. B.M. Das - Principles of Foundation Engineering, PWS-Kent, Boston, USA, 1990
4. L. Abramson, T. Lee, S. Sharma, G. Boyce – Slope Stability and Stabilization Methods, John Wiley & Sons, Inc., New York, USA, 2002

**9. Corroboration of the content of the discipline with the expectations of the main representatives of the epistemic community, professional associations and employers in the field afferent to the program**

<sup>13</sup> At least one title must belong to the discipline team and at least one title should refer to a reference work for discipline, national and international circulation, existing in the UPT library.

<sup>14</sup> Types of application activities are those specified in footnote 5. If the discipline contains several types of applicative activities then they are sequentially in the lines of the table below. The type of activity will be in a distinct line as: "Seminar:", "Laboratory:", "Project:" and / or "Practice/training".

<sup>15</sup> At least one title must belong to the discipline team.

- The discipline is in accordance with the ability of the civil engineers required by the civil engineering management and design companies.
- The content of the discipline was adapted to the requirements of the labor market, following the discussions in professional meetings or scientific conferences organized by civil engineering companies.

## 10. Evaluation

| Type of activity  | 10.1 Evaluation criteria <sup>16</sup>  | 10.2 Evaluation methods   | 10.3 Share of the final grade |
|---|---|---|-------------------------------|
| 10.4 Course   | Answer to subjects from lecture and application area  | Written exam. There must be treated two subjects from the discipline content. | 60%                           |
| 10.5 Applied activities   | <b>S:</b>   |   |                               |
|   | <b>L:</b>   |   |                               |
|   | <b>P<sup>17</sup>:</b> Solving problems corresponding to the project hours during semester time | Homework, class evaluation during the semester and project delivery           | 40%                           |
|   | <b>Pr:</b>  |   |                               |
| <b>10.6 Minimum performance standard</b> (minimum amount of knowledge necessary to pass the discipline and the way in which this knowledge is verified <sup>18</sup> )  |   |   |                               |
| <ul style="list-style-type: none"> <li>• To pass the exam it is necessary to obtain a minimum 5 (five) grade for each of the exam subjects, a minimum of 75% presence to lecture and project hours and it is necessary to prove knowledge learned during laboratory hours.</li> </ul> |   |   |                               |

**Date of completion**

January 2018

**Head of Department  
(signature)**

.....

**Course coordinator  
(signature)**

.....  
**Date of approval in the Faculty  
Council <sup>19</sup>**

12.02.2018

**Coordinator of applied activities  
(signature)**

.....

**Dean  
(signature)**

.....

<sup>16</sup> Syllabus must contain the procedure for assessing the discipline, specifying the criteria, methods and forms of assessment, as well as specifying the weightings assigned to them in the final grade. The evaluation criteria shall be formulated separately for each activity foreseen in the curriculum (course, seminar, laboratory, project). They will also refer to the forms of verification (homework, papers, etc.)

<sup>17</sup> In the case where the project is not a distinct discipline, this section also specifies how the outcome of the project evaluation makes the admission of the student conditional on the final assessment within the discipline.

<sup>18</sup> It will not explain how the promotion mark is awarded.

<sup>19</sup> The endorsement is preceded by the discussion of the board's view of the study program on the discipline record.