

SPECIAL FOUNDATIONS

Subject code: **06.4-WILŚ- BUD- FSP- KC09**

Subject type: Obligatory

Language of instruction: English

Responsible for the subject: Unit currently conducting lectures

Providing education: Department of Geotechnology and Geodesy

Type of class	Number of classes per semester	Number of classes per week	Semester	Type of credit test	ECTS points	
1. Full time studies						
Lecture	15	1	II	credit with a grade	2	
Project	15	1		credit with a grade		
2. Part time studies						
Lecture	9	1	II	credit with a grade		
Project	9	1		credit with a grade		

SUBJECT OBJECTIVE:

Discussion of problems connected with special building foundations. Designing deformable foundations on a deformable substrate.

INITIAL REQUIREMENTS:

Strength of materials, Geology, Soil mechanics, Construction of foundations, Finite element method.

SUBJECT SCOPE:

Lecture

*Behaviour of normally consolidated and pre-consolidated loaded soils with drainage and without drainage;
Soil strength anisotropy;
Computational models of subsoil;
Determination of substrate parameters for the purpose of designing special foundations;
Designing deformable foundation benches and slabs on a deformable substrate;
Analysis of piles loaded with horizontal force; Foundations of wind power plants;
Foundations of slurry walls;
Ground anchors and anchored retaining walls of trenches;
Reinforced structures made of reinforced soil.*

Project

Design of a deformable row bench as the foundation of a frame structure.

Educational methods:

Lecture - conventional lecture,
Project - individual and team work on a project.

EDUCATION RESULTS:

Results after completion of the course	Symbol	Verification methods	Type of class
Knowledge			
The student knows the behaviour of soil in particular computational situations and can choose a computational model that represents this behaviour. The student can discuss the advantages and disadvantages of individual soil and ground models. The student can propose a proper method for foundation of non-standard objects such as wind power plants and underground car parks. The student knows the principles of designing retaining structures for deep trenches and high embankments. The student can describe modern technologies of soil reinforcement	K_W03	Test with points	L
Abilities			
The student can plan appropriate experimental research and identify the geotechnical parameters of a substrate model. The student can design deformable direct foundations resting on an elastic substrate using numerical methods	K_U09	Projects	P
Social skills			
The student is aware of responsibility for work and is ready to comply with teamwork rules	K_K04	conversation during lectures initiated by the teacher; checking competences during the introduction to classes	L , P

VERIFICATION OF EDUCATION RESULTS AND CONDITIONS FOR A CREDIT:

Lecture	a test with points.
Project	completion on time of a previously discussed and approved project or a written test about the project.

Criteria for written tests:

91-100% correct answers	grade 5.0
81-90 % correct answers	grade 4.5
71-80 % correct answers	grade 4.0
61-70 % correct answers	grade 3.5
51-60 % correct answers	grade 3.0
0-50 % correct answers	grade 2.0

Final grade for the subject $G = (L+P)/2$

STUDENT WORK:

Organized classes	15I + 15P =	30 h
Lecture – individual work		10 h
Project – individual work		20 h
Total	30 + 10 + 20 =	60 h
ECTS for the subject	60 / 30 =	2 ECTS

BASIC LITERATURE:

1. Biernatowski K.: Fundamentowanie, PWN, Warsaw 1984.
2. Brząkała W. (red.): Fundamentowanie. Przewodnik do projektowania. Tom 2. Wyd. Politechniki Wrocławskiej, Wrocław 1989.

3. Dembicki E. i inni: Fundamentowanie. Projektowanie i wykonawstwo, t.2, Arkady, Warsaw 1988.
4. Jarominiak A. i inni: Pale i fundamenty palowe. Arkady, Warsaw 1976.
5. Rossiński B. i inni: Fundamenty. Projektowanie i wykonawstwo, Arkady, Warsaw 1976.
6. Stilger-Szydło E.: Posadowienie budowli infrastruktury transportu lądowego. Teoria – projektowanie – realizacja, DWE, Wrocław 2005

ADDITIONAL LITERATURE:

1. Bowles J.E.: Foundation analysis and design, McGraw-Hill, New York 1988.
2. Das B.M.: Principles of foundation engineering, PWS Eng., Boston 1984.
3. Wysokiński L., Kotlicki W., Godlewski T.: Projektowanie geotechniczne według Eurokodu 7. Poradnik, ITB Warsaw 2011.
4. PN-EN 1997: 2008 Eurokod 7. Projektowanie geotechniczne. PKN, Warsaw.
5. PN-83/B-02482. Fundamenty budowlane. Nośność pali i fundamentów palowych.

SYLLABUS PREPARED BY:

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