


5.00 credits

30.0 h + 30.0 h

Q1

Teacher(s)	Rattez Hadrien ;
Language :	English > French-friendly
Place of the course	Louvain-la-Neuve
Prerequisites	Basic concepts of soil classification, effective stress, compressibility, shear strength, laboratory and site investigation, design of shallow and deep foundations, as taught in the courses LGCIV1031 and LGCIV1072.
Main themes	<p>The objectives of the course are:</p> <ul style="list-style-type: none"> • To strengthen the knowledge of geotechnical engineering through discussion of advanced concepts: lateral actions, soil-structure interaction, soil anisotropy and heterogeneity. • To explain the design principles of geotechnical elements of a construction project: walls, sheet pile walls, piles, soil improvement methods. • To familiarize the student with the significance of certain elements on the stability of constructions: groundwater, drainage, monitoring.
Learning outcomes	<p>At the end of this learning unit, the student is able to :</p> <p>Contribution of the course to the program objectives (N°):</p> <ul style="list-style-type: none"> • AA1.2, AA1.3 • AA2.1, AA2.2 • AA4.1 • AA5.1, AA5.2, AA5.3 <p>Specific learning outcomes of the course</p> <p>At the end of the course, students will be capable of:</p> <ul style="list-style-type: none"> • describing the execution methods for the installation of walls; • designing a retaining wall; • describing soil improvement methods; • modelling an element of a geotechnical project (numerical approach); • calculating deformation and loading of structures interacting with soil; • identifying potentially dangerous situations in presence of groundwater; • describing the behaviour of soft soils, calcareous sands, unsaturated soils.
Evaluation methods	<p>Continuous assessment and final oral exam.</p> <p>The continuous assessment is based on the grades obtained for a presentation given in groups, assignments and the presence to mandatory seminars and a practical laboratory course. These activities cannot be repeated in a second session; the continuous assessment mark acquired in the first session is retained in the event of a second session.</p> <p>Failure to comply with the methodological guidelines, particularly with regard to the use of online resources or collaboration between students for the assignment/project, will result in an overall mark of 0 for the continuous evaluation.</p> <p>The use of generative artificial intelligence (such as ChatGPT, Consensus, Perplexity, Bard, etc.) is prohibited for this course.</p>
Teaching methods	<p>Ex-cathedra teaching through the course resources for volume 1 and two seminars.</p> <p>Supervised exercise sessions in classroom for volume 2 and one practical session in the laboratory.</p>
Content	<ul style="list-style-type: none"> • Retaining walls. • Walls and sheet-pile walls. • Soil improvement. • Constitutive laws of soil behaviour. • Introduction to numerical methods (finite elements) for geotechnics. • Soil-structure interaction. • Horizontal loading on geotechnical elements. • Rock mechanics • Tunnels
Inline resources	Available on Moodle.

Bibliography	Supports du cours et documentation sur Moodle.
Faculty or entity in charge	GC

Programmes containing this learning unit (UE)				
Program title	Acronym	Credits	Prerequisite	Learning outcomes
Master [120] in Civil Engineering	GCE2M	5		
Master [120] in Architecture and Engineering	ARCH2M	5		