

## Faculty of Applied Sciences



### AMCO2174 Geotechnic

[30h+15h exercises] 4 credits

This course is taught in the 1st semester

**Teacher(s):** Alain Holeyman, Jean-François Thimus  
**Language:** French  
**Level:** Second cycle

#### Aims

Give to the students the expertise of knowledge seen in cursus AUCE 1171, 1172 and 1173

#### Main themes

Provide engineering students advanced design methods to solve geotechnical problems connected with civil engineering projects.

Knowledge:

- Soil-structure interaction under static conditions
- Advanced analysis of slope stability, design of foundations and soil retaining structures
- Foundation and soil improvement technologies

Know-how:

- Integrate basic engineering disciplines (soil mechanics, constitutive modeling, statics of structures) to analyze interactive stability of soil and structures
- Assess feasibility and select best available design method to study foundation problems, select appropriate design parameters and most appropriate technology to solve a foundation problem

#### Content and teaching methods

- Soil-structure interaction as an advanced method to design spread footings, piled rafts, piles under horizontal loading, diaphragm walls; interest and limitation of finite elements software
- Groundwater flow analysis under complex conditions: anisotropy, heterogeneity, free surface groundwater flow, seepage forces, piping, transient conditions, interpretation of pumping tests results
- Ultimate states design and soil plasticity
- Foundation technology, temporary and permanent soil improvement techniques
- Advanced analysis of slope stability: discussion of drained vs. undrained conditions and parameters, connection with laboratory triaxial and other shear testing, advanced slice methods (complete Bishop, Janbu, Morgenstern & Price), use specific software

Lectures are delivered in auditoria. Exercises are administered under a seminar format to solve case studies. Use of the Plaxis® Finite Element and Geo-Slope ® softwares is introduced.

**Other information (prerequisite, evaluation (assessment methods), course materials recommended readings, ...)**

Prequesit : AUCE 2173, Statics

#### Other credits in programs

<b>FSA3DS/GC</b>	Diplôme d'études spécialisées en sciences appliquées (génie civil)	(4 credits)
<b>GC22</b>	Deuxième année du programme conduisant au grade d'ingénieur civil des constructions	(4 credits)