

46026 - GEOTECHNICAL DESIGN OF STRUCTURES AND ROADS

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LOCATION : ENPC - Paris

LANGUAGE : French (*)

DURATION : 3 weeks

FEES : 5 950 €HT

() it is possible to organize this course in English on demand*

Geotechnical Engineering is involved in the design of any structure resting on or buried in the ground, whether it be soil or rock. Geotechnical Engineering gets input from geology, hydrology, soil mechanics, and rock mechanics. It includes the knowledge of design and construction of all types of foundations for buildings, bridges, retaining walls, dams, as well as expertise in earthworks, tunneling, slope stabilization, soil improvement and reinforcement.

Geotechnical Engineering plays a very important role in most construction projects, since:

- It permits to design foundations of structures on the basis of an adequate safety factor against failure and against detrimental settlements, taking into consideration cost effectiveness.
- It permits to analyze the behavior of large embankments and to build them for new motorways, railways lines and also for industrial and commercial projects.
- It permits to treat, stabilize, improve and reinforce man-made or natural soils in these various projects.

Structures quality and durability are directly function of their design and construction means. Thus, it is necessary for their designers and the involved contractors to be aware of the latest developments in this field of geotechnical engineering.

AIMS OF THE PROGRAMME

This continuing education programme is organized by the ENPC-Ponts Formation Edition, in collaboration with APAGEO, the CERMES, SCETAUROUTE, the LCPC and SOLETANCHE-BACHY. It shall permit the trainees to further:

- Use the most recent techniques of geotechnical engineering to design civil engineering structures.
- Be in a position to select the best fitted design and construction techniques according to the geotechnical conditions of the project.

AUDIENCE

This three weeks continuous education programme is intended for:

- design office engineers, the design office being that of a consulting engineer firm or that of a contracting firm,
- engineers of laboratory firms, either state-owned or private ones,
- teachers and lecturers in civil engineering departments at the University level.

PROGRAMME

SOIL INVESTIGATION AND SOIL BEHAVIOUR

- Soil Mechanics revisited.
- Boring and sampling methods.
- In situ stress – strain tests.
- Soil behaviour and elastic plastic constitutive law.
- Water tests.
- Modelling arid soils and unsaturated soils.
- Stress/Strain laboratory tests.
- *Laboratory visits and practical cases.*

GEOTECHNIC STRUCTURES : DESIGN, PAVEMENT, CONCRETISATION

- Shallow foundations.
- Dams.
- Deep foundations.
- Retaining structures.

INNOVATING TECHNIQUES

- Pile Instrumentation.
- Structures monitoring in Civil Engineering.
- Soil reinforcement and soil improvement.
- Geoenvironmental engineering.

Visits on innovating construction sites.

HIGHWAYS STRUCTURES

- Embankments.
- Earthworks: laboratory tests, soil classification, compaction, soil treatment, PST, capping layer.
- Pavement and capping layer: laboratory tests, fabrication, execution and reception.

Visits on construction sites.