

Computer Methods with Realistic Constitutive Models for Geotechnical Applications

Course Lecturers

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Course Aims and Expected Attendees

The course emphasizes the important topic of constitutive modeling, testing for geo-materials and interfaces/joints, and the determinations of parameters from laboratory test data that is essential for realistic solution of practical problems. Applications to a wide range of geotechnical problems using up-to-date computer codes, two- and three-dimensional, will be described, including validations for a number of laboratory simulated and field problems.

This course aims at practitioners and researchers working in the field of Geotechnical Engineering with interest in applications of the Finite Element Method.

Course Outline

Finite Element Method:

Liner and nonlinear equations for dry and saturated materials, static and dynamic analysis, construction sequences.

Constitutive Models:

- Brief review of conventional elastic and plastic models,
- Unified Disturbed State Concept (DSC),
- Hierarchical Capabilities: Elastic, plastic, continuous yield plasticity, hierarchical single surface plasticity, creep, microcracking leading to fracture, softening and failure,
- Liquefaction.

Applications:

Applications using two- and three-dimensional codes; e.g., DSC-SST2D, DSC-SSTDYN, DSC-SST3D, FLAC and others.

Examples:

Building-foundations, Pile foundations, Dams, Tunnels and cavities, Retaining (reinforced) walls including stochastic modeling, Un-reinforced and reinforced Pavements including compacted sub grade materials, Landslides, Glacier motions.

Language

All lectures and course notes will in English.