

Op+um<sup>CE</sup> CRASH COURSE

# Limit analysis and FEM: The perfect combination

29 April 2022 14:00-18:00 (CET)

## > OVERVIEW

Foundations, slopes, and tunnels are some of the geotechnical works that require the precise analysis of safety factors. This course will introduce reliable and fast approaches to perform limit analyses with the finite element software Optum G2.

In particular, the determination of safety factors, upper and lower bounds, and the strength reduction analysis. The course has a strong practical component; participants will apply the concepts using the Finite Element software Optum G2.

## > OBJECTIVES

Learn the possibilities of OPTUM G2 as a tool for the limit analysis in combination with finite element

Include limit analysis in the workflow for the design of geotechnical structures.

Introduce the concept of strength reduction finite element analysis and its application.

Analyze failure under drained and undrained conditions

## > SKILLS

Limit analysis

Hands on with  
Optum G2

Geotechnical  
design

Finite element  
method

## > TARGET

The course is meant for civil and environmental engineers, geologists, and construction professionals

## > METHOD

- The course is oriented towards the practical application
- The course is centered around the development of a finite element model from start to end

## > CERTIFICATION

A certificate of attendance is issued at the end of the course

## > TRAINERS

### **Prof. Lyesse Laloui**

ISSMGE Vice-president for Europe  
Swiss Federal Institute of Technology,  
(EPFL), Lausanne, Switzerland

### **Dr. Jose A. Bosch**

Nesol – Numerical Engineering  
Solutions, Lausanne, Switzerland

### **Prof. Kristian Krabbenhoff**

Cofounder of OPTUM CE  
University of Liverpool, UK

## > FORMAT

### **Workshop**

Duration: **4 hours**

Location: **live online course**

Limited places

## > COURSE PROGRAM

### **A Combining finite element and limit analysis**

- > Main applications in geotechnical engineering
- > Advantages of FE limit analysis
- > Modeling hypothesis

### **B Limit analysis with Opt+um<sup>G2</sup>**

- > Shallow foundation analysis with FE limit analysis
- > Determination of slope stability safety factors

### **C Model sensitivity**

- > Undrained and drained conditions
- > Assessment of mesh influence
- > Seepage

## > OPTUM G2 DISCOUNT

The course fee will be discounted for the purchase of a 1-year **Opt+um<sup>G2</sup>** license!



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**Info and registrations**

<https://learning.nesol.net>