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COURSE: Slope stability

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ACADEMIC YEAR: 2017/18

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TYPE OF EDUCATIONAL ACTIVITY: Affine

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TEACHERS: Caterina Di Maio, Roberto Vassallo

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<http://oldwww.unibas.it/utenti/vassallo/home.shtml>

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phone: +39 0971 205388 - 205390

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mobile (optional):

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Language: Italian/English if foreign students will attend

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ECTS: (lessons and tutorials/practice) 9	n. of hours: (lessons and tutorials/practice) 81	Campus: Potenza Dept./School: School of Engineering Program: Master in Civil Engineering	Semester: II
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#### EDUCATIONAL GOALS AND EXPECTED LEARNING OUTCOMES

The course focuses on the stability analysis of natural and artificial slopes, on the methods for the stabilization of landslides or for the reduction of their displacements and on hydro-geological risk management criteria.

**Knowledge and understanding:** students have to prove themselves able to know and understand landslide typologies, triggering factors, methods for investigation and monitoring, methods for slope stability analysis and for the improvement of safety conditions, how an advanced software for slope and landslide modelling works.

**Applying knowledge and understanding:** students have to prove themselves able to plan site and laboratory investigations, interpret data, use advanced software critically, design remedial measures for landslide risk mitigation.

**Making judgements:** students have to be able to deepen what they learn, in order to use the acquired knowledge as a good basis to obtain further results, with ever-growing maturity and independent judgement.

**Communication:** students have to be able to communicate the acquired knowledge, also to non-expert people, by using the scientific language.

**Lifelong learning skills:** students have to be able to continuously update their knowledge by consulting books, documents and publications and by attending specific seminars.

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#### PRE-REQUIREMENTS

A good knowledge of Soil Mechanics is required.

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#### SYLLABUS

1. Advances in Soil and Rock Mechanics (14 hours)
  2. Classification and kinematics of landslide phenomena, Landslide hazard and risk, Landslide investigation and monitoring of main parameters (pore water pressures, strains, displacements) (21 hours)
  3. Analysis of the factors that influence the behaviour of slopes and landslides (rainfall, toe erosion, excavations, earthquakes) (14 hours)
  4. Stability analysis methods (Limit equilibrium – Failure along planar surfaces: planar failure, wedge failure, infinite slope – Failure along curved surfaces: methods of slices). Slope stability analysis according to the new Italian Technical Code (10 hours)
  5. Stress – strain analysis by finite element software (6 hours)
  6. Stabilization measures: Modification of ground surface topography, Drainage, Retaining structures, Soil nailing and anchors, Mechanically Stabilized Earth (MSE), Improvement of soil mechanical properties, Soil improvement by chemical and bioengineering methods (16 hours)
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#### TEACHING METHODS

The course includes 81 hours consisting of: Theoretical lessons, Classroom tutorials, Project works, Technical visits, Seminars.

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#### EVALUATION METHODS

Oral examination, Discussion of project works.

The objective of the exam is to verify which level the student has reached relatively to the educational goals specified above.

During the exam the teachers will evaluate the student's ability to make links and compare the different aspects dealt with in the course.

On student's request, the exam can also consist in carrying out a project work in the classroom by a computer.

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#### TEXTBOOKS AND ON-LINE EDUCATIONAL MATERIAL

Selected journal papers, guidelines, course handouts provided by the professors.

On-line educational material is made available in a shared dropbox folder or at:  
<http://www2.unibas.it/dimaio/home.html>; <http://oldwww.unibas.it/utenti/vassallo/home.shtml>

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#### INTERACTION WITH STUDENTS

At the beginning of the course, after describing objectives, syllabus and evaluation methods, the teachers make some educational material available to the students by a shared dropbox folder or by the websites mentioned above. At the same time, a list of the students is gathered reporting name, surname, matriculation number, and e-mail address.

Office hours:

Prof. Di Maio: Tuesday from 9 to 14, Macchia Romana Campus, Soil Mechanics Laboratory (Laboratorio di Geotecnica), room 2.

Prof. Vassallo: Monday from 15 to 18, Macchia Romana Campus, Soil Mechanics Laboratory (Laboratorio di Geotecnica), room 4.

Besides, the professors are always available for assisting the students by e-mail or by video-calling.

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#### EXAMINATION SESSIONS (PLANNED)<sup>1</sup>

12/01/18, 02/02/18, 02/03/18, 06/04/18, 04/05/18, 08/06/18, 06/07/18, 20/7/18, 07/09/18, 05/10/18, 9/11/18, 07/12/18

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SEMINARS BY EXTERNAL EXPERTS    YES

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#### FURTHER INFORMATION

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