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COURSE: **Materials for Roads, Railways and Airports construction + Design of Roads, Railways and Airports**

TEACHER: **Michele AGOSTINACCHIO (Person in charge – 9 ECTS), Donato CIAMPA (3 ECTS)**

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website:

Language: **Italian**

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ECTS: **12**

n. of hours: **108**

Academic year: **2014-15**

Campus: **Potenza**

Semester: **Annual**

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#### TOPICS

The construction of the road structure. The bituminous binders and the rheology of bitumens. The mixtures used in road superstructures. Design of pavements. Elements for the railways construction. Advanced geometric design. Rockfalls. Evaluation and management of the environmental impact.

#### TEACHING METHODS

Theoretical lessons

Tutorials in classroom

Tutorials in laboratory

Project works

Technical visits

Other activities (please specify)

#### TEXTBOOKS

M. Agostinacchio, D. Ciampa, S. Olita, *Strade Ferrovie Aeroporti* III edizione, EPC Srl, Roma.

M. Agostinacchio, D. Ciampa, S. Olita, *La Progettazione delle Strade* II edizione, EPC Srl, Roma.

M. Agostinacchio, D. Ciampa, S. Olita, *Movimento terra e macchine per lavori stradali*, EPC Srl, Roma

M. Agostinacchio, S. Olita, *Elementi di ritenuta paramassi*, EPC Libri, Roma.

P.Ferrari, F. Giannini, *Ingegneria Stradale* Vol. 1 e 2, ISEDI.

G. Tesoriere, *Strade Ferrovie Aeroporti*, Vol. 1 e 2, UTET.

F. Giannini, F. La Camera, A. Marchionna, *Appunti di Costruzione di Strade Ferrovie ed Aeroporti*, Masson ed. ESA.

F. La Camera, *Il calcolo del progetto stradale la planimetria*, Masson ed. ESA.

Course notes provided by the professor.

#### ON-LINE EDUCATIONAL MATERIAL

web address:

#### LEARNING OUTCOMES

Acquire the theories and techniques aimed at construction and testing of rail and road infrastructure through the study of traditional and innovative materials, subjected to the stresses induced by dynamic loads. Tackle the problems relating to stability and computational analysis, both static and dynamic, of the road structures and pavements. Acquire the theoretical tools and techniques addressed in the design and the advanced design of the road and rail infrastructures in relation to the environmental impact.

#### REQUIREMENTS

It is suggested to pass previously the exam of "*Basics of Roads, Railways and Airports*".

#### EVALUATION METHODS

Intermediate verifications

Written examination

Discussion of a project work

Practical test

Oral examination

Other methods: Evaluation of numerical exercises.

#### DETAILED CONTENT

The construction of the road structure. Elements of road geotechnics. The stone aggregates. The bituminous binders. Rheology of bitumen and SHRP program. Mixtures used in pavements. The traditional asphalt concretes. The non-traditional asphalt concretes. The contract specifications for road work. The use of C&D in road construction. Approach to the design of road pavements and catalogs of superstructures. Design of flexible, semi-



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rigid and rigid pavements: empirical, semiempirical and rational calculations methods. Use of calculation codes for automatic design of roads, railways and airports. Overview of quality control. Elements for the railways construction: materials and techniques. Advanced road and rail axis geometry. Design of intersections ramps. Design of retaining structure in reinforced earth. Rockfalls. Evaluation and management of the environmental impact.

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SEMINARS BY EXTERNAL EXPERTS    YES  NO

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#### FURTHER INFORMATION

The didactic organization provides for 108 total hours of which 64 hours of lecture and 44 of practice. The certificate of attendance of didactic activities is ex-officio satisfied at the end of the semester in which they are located.

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