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COURSE: Strength of Materials

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TEACHER: Nicola M. Auciello

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Language: italian

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ECTS: cfu 9	n. of hours: 90	Academic year: 2017.18	Campus: Potenza	Semester: I,II
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#### TOPICS

Study of elastic solids.

Beam theory and its applications

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#### TEACHING METHODS (please tick one or more options)

Theoretical lessons

Tutorials in classroom

Tutorials in laboratory

Project works

Technical visits

Other activities (please specify) \_\_\_\_\_

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#### TEXTBOOKS

- You sharpen theoretical and examples furnished during course
  - V. Franciosi, Fondamenti di Scienza delle Costruzioni, Vol. 1,2,3. Ed. Liguori, Napoli.
  - V. Franciosi, Problemi di Scienza delle Costruzioni. Vol. 1, 2, 3. Ed. Liguori, Napoli.
  - E. Viola, Esercitazioni di Scienza delle Costruzioni, Vol. 1, 2. Ed. Pitagora
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#### ON-LINE EDUCATIONAL MATERIAL

web address: <http://profauciello.altervista.org/>

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#### LEARNING OUTCOMES

Ability to set up and solve problems related to the behavior of structures through the procedures set out during the course.

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#### REQUIREMENTS

Calculus I and II, Geometry, Mathematical Physics

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#### EVALUATION METHODS (please tick one or more options)

Intermediate verifications

Written examination

Discussion of a project work

Practical test

Oral examination

Other methods (please specify) \_\_\_\_\_

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#### DETAILED CONTENT

Introduction to vector and tensors, linear transformation, antisymmetric and symmetric transformation. Configuration of continuum bodies, analysis strain. Analysis stress: the concept of stress. Elastic stress-strain relation and formulation of elasticity problem; Isotropic materials. Failure Criteria: Tresca's Criterion Energy principles and introduction to variational methods; principle of virtual work, principle of stationary potential energy, principle of Betti. The elementary theory of beams: De Saint Venant theory; axial force, bending, shear end torsion of the beam. Elastic stability: columns and beam-column; buckling of Long Slender Columns. Structural Analysis: analysis of statically structures. Analysis of statically indeterminate structures by the force method; applications of tress and beams.

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SEMINARS BY EXTERNAL EXPERTS YES  NO

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#### FURTHER INFORMATION

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