Università degli Studi della Basilicata
Scuola di Ingegneria

COURSE: Structural Engineering				
TEACHER: Angelo MASI				
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Language: Italian				
ECTS: 9	n. of hours: 90	Academic year: 2014-15	Campus: Potenza	Semester: II

TOPICS
Materials, actions, principles of structural safety
Design of reinforced concrete structures
Design of steel structural members
National and international codes on structural design

TEACHING METHODS (please tick one or more options)
x Theoretical lessons
x Tutorials in classroom
x Tutorials in laboratory
x Project works
☐ Technical visits
Other activities (please specify) _____

TEXTBOOKS
E. Cosenza, G. Manfredi, M. Pecce, Strutture in cemento armato. Basi della progettazione, ed. Hoepli.
National (DM 14.1.2008) and international building codes (Eurocodes 1 e 2).
Lecture notes

ON-LINE EDUCATIONAL MATERIAL
web address: www.angelomasi.it

LEARNING OUTCOMES
Providing basic knowledge of structural design in order to make safety verifications of simple structures made up of the materials mainly used in civil engineering (e.g. reinforced concrete, steel), complementing the theoretical notions of the Strength of Materials course. The methodologies for the design of reinforced structures are provided in the framework of national and international building codes.

REQUIREMENTS
The attendance of the Strength of Materials course is suggested.

EVALUATION METHODS (please tick one or more options)
☐ Intermediate verifications
x Written examination
x Discussion of a project work
☐ Practical test
x Oral examination
Other methods (please specify) _____

DETAILED CONTENT
Building materials. Actions. Stresses and deformation analysis on one or more span beams. Introduction to Sap 2000 software. Notes on structural design. Analysis of structural safety. Probabilistic evaluation of safety: 1st, 2nd and 3rd level methods. Application examples. Stresses analysis of framed structures.
General notes on reinforced concrete (RC) structures. National and international building codes on RC structures. Technology and mechanical properties of concrete. Short accounts on fluage effect in concrete. Properties and characteristics of steel reinforcement for RC structures. Steel-concrete adherence. Definition and classification of Limit States. Characteristic and design values of actions and materials strength. Principles of Limit States design in RC structures. Ultimate limit state (SLU) for bending with or without axial force. Bending-Axial force domains. SLU for shear stresses. SLU for torsion stresses. Serviceability Limit State (SLE): stress limitation, crack control, deflection control. Basic notions for safety verification of steel structures: material, mechanical properties and tests, safety

verification of members under compression axial load, bending moment, shear. Simple bolted joints. Technical-administrative and executive issues in the design and construction of RC structures.
Exercise: design of simple RC structures (slab and plane frame).

SEMINARS BY EXTERNAL EXPERTS YES x NO ☐

FURTHER INFORMATION