Università degli Studi della Basilicata
Scuola di Ingegneria

COURSE: Structural Strengthening

TEACHER: Prof. Felice Carlo Ponzo (6CFU) – Ing. Marco Vona (3CFU)

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Language: Italian

ECTS: 9	n. of hours: 81	Academic year: 2014-15	Campus: Potenza	Semester: 2nd

TOPICS

The course provides basic knowledge and specialized information on the techniques for the assessment of reinforced concrete and masonry existing structures, on the techniques for in situ tests on materials and on the methodologies for the design of the strengthening of the existing buildings using classical and innovative approach.

TEACHING METHODS (please tick one or more options)

x Theoretical lessons
x Tutorials in classroom
x Tutorials in laboratory
x Project works
x Technical visits
Other activities (please specify) _____

TEXTBOOKS

- Sisto Mastrodicasa, Dissesti Statici delle Strutture Edilizie, diagnosi e consolidamento, HOEPLI.
- Manfredi G., Masi A., Pinho R., Verderame G., Vona M., 2007, Valutazione di edifici esistenti in C.A., Collana di manuali di progettazione antisismica, IUSS Press, Pavia.
- Dolce M., Ponzo F., Di Cesare A. Arleo G., (2010), Progetto di edifici con isolamento sismico, IUSS Press, Pavia.
- Normative:
  - DM 14.01.2008, Nuove norme tecniche per le costruzioni
  - CIRCOLARE 2 febbraio 2009, n. 617, Istruzioni per l'applicazione delle «Nuove norme tecniche per le costruzioni» di cui al decreto ministeriale 14 gennaio 2008.
  - Norme UNI e CNR per le prove in situ ed in laboratorio
  - Linee guida per FRP, 2009

ON-LINE EDUCATIONAL MATERIAL

web address: http://www2.unibas.it/ponzo/Sito/MAIN.html, http://www.unibas.it/utenti/vona/

LEARNING OUTCOMES

To provide students with the tools for understanding the static and dynamic behaviour of masonry and reinforced concrete existing buildings and for designing the strengthening of complex structures, even in the earthquake zone, using classic and innovative techniques.

REQUIREMENTS

The students must have passed “Strength of Materials” and “Reinforced Concrete Structures” exams.

EVALUATION METHODS (please tick one or more options)

 Intermediate verifications
 Written examination
x Discussion of a project work
 Practical test
x Oral examination
Other methods (please specify) _____

DETAILED CONTENT

- Reference standards: Existing Buildings: Assessment, Safety and verification criteria, level of knowledge.
- Masonry Buildings: Behaviour of masonry structures subjected to seismic action, Hierarchy of failure modes, Break-up of wall texture, collapse mechanisms of the wall outside of the plan, collapse mechanisms of the wall in the

plane, horizontal structures and roofing, construction details, properties of materials, laboratory tests or in situ, destructive tests, moderately destructive Testing, non-destructive Testing, Assessment, classic and innovative interventions.
- Reinforced concrete Buildings: characteristics of the structure and structural details, program of the investigation, material properties, Investigations on the concrete, the non-destructive methods, processing of test results on concrete, Investigations on steel reinforcements, assessment, seismic protection levels and factors of importance, seismic action and combination of the components of the seismic action, methods of structural analysis and conditions of applicability, Interventions - classical techniques and innovative Techniques (base isolation, dissipative bracings, DIS-CAM, FRP)

SEMINARS BY EXTERNAL EXPERTS YES x NO ☐

FURTHER INFORMATION