Università degli Studi della Basilicata
Scuola di Ingegneria

ACCADEMIC YEAR 2019-2020

COURSE: **Seismic Risk**

TYPE OF EDUCATIONAL ACTIVITY: Basic

TEACHER: PROF. Angelo MASI (6CFU) – PROF. Antonio DI CESARE (3CFU)

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phone: 0971 205061	mobile (optional):
Language: Italian	

ECTS: 9	n. of hours: 90	Campus: Potenza	Semester: I

EDUCATIONAL GOALS AND EXPECTED LEARNING OUTCOMES

Providing basic knowledge on seismic risk and more generally on civil protection activities, with particular attention to evaluation and reduction of the seismic vulnerability of built environment. The course gives methods and tools for the planning and management of earthquake emergencies, as well as for setting up seismic risk mitigation strategies.

Knowledge and understanding: the student must know the basic elements of seismic risk: Hazard, Vulnerability, Exposure. He must be able to assess the vulnerability of existing buildings, to know the hazard maps in Italy, the Macroseismic Scales and earthquake scenarios.

Ability to apply knowledge and understanding: The student must be able to make an earthquake scenario, effects on the building stock and human beings, suggestions for civil protection plans.

Autonomy of judgment: the student must be able to deepen his / her own knowledge as he / she learns, using the knowledge gained as a starting point for achieving increasing maturity and autonomy of judgment.

Communicative Skills: the student must be able to explain the notions acquired in the course, in a simple way, even to non-experienced people, using a correct scientific language.

Larning Skills: the student must be able to become self-sufficient in order to deepen their knowledge through books, scientific publications, and attendance at specialized seminars.

PRE-REQUIREMENTS

Students must have acquired and assimilated the basic knowledge provided by the courses of the “Earthquake Engineering”.

SYLLABUS

1. Lessons learnt from past earthquakes in Italy and worldwide. Seismic risk: Hazard, Vulnerability, Exposure. General notes on sesmic amplification effects. Seismic vulnerability evaluation: Damage Probability Matrices, Fragility Curves.. History of seismic codes and hazard maps in Italy. Macroseismic Scales, EMS 98 scale. Seismic Risk analyses and earthquake scenarios.
2. Damage scenarios of lifelines and of RC and masonry buildings. Social and economic loss estimation. HAZUS methodology. Fragility Curves.
3. Prevision and Prevention programs. Emergency Planning and Management. Post-earthquake usability surveys: concepts, tools, responsibilities, damage inspection. The Italian (AeDES) usability survey form. Mitigation strategies, the new seismic codes in Italy, OPCM 3274. Evaluation and retrofitting of existing Reinforced Concrete buildings. Examples and applications.
4. Annual Exercise: preparation of an earthquake scenario, effects on the building stock and human beings, suggestions for civil protection plans.

TEACHING METHODS

90 hours of: Theoretical lessons, Classroom tutorials.

EVALUATION METHODS

The exam consists in:

- Oral examination. The tutorial carried out during the course will also be discussed

TEXTBOOKS AND ON-LINE EDUCATIONAL MATERIAL

A. Coburn, R. Spence. Earthquake Protection, J. Wiley & Sons, 2002.

Lecture notes on web site: www.angelomasi.it

INTERACTION WITH STUDENTS

At the beginning of the course, after the description of the course program, aims, and exams procedures, the teacher indicates the teaching material (www.angelomasi.it). He also collects the list of the students who attend the course (name, surname, and e-mail address).

The teacher generally receives students on Thursday from 9:30 to 11:30 in his office (School of Engineering, third floor) but he can be also contacted by e-mail.

EXAMINATION SESSIONS (FORECAST)[1]

4.2.20, 28.2.20, 8.4.20, 26.6.20, 24.7.20, 8.9.20, 30.9.20, 11.11.20, 16.12.20

SEMINARS BY EXTERNAL EXPERTS YES x NO □

FURTHER INFORMATION

[1] Subject to possible changes: check the web site of the Teacher or the Department/School for updates.