FACULTY OF **ENGINEERING**

DEGREE COURSE: **CIVIL AND ENVIRONMENTAL ENGINEERING BS**

SUBJECT: EARTHQUAKE ENGINEERING

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OBJECTIVES

This course will provide the student with:

1. The principles of architectural design for earthquake resistant buildings.
2. The development of seismic engineering and how it is transforming architecture.
3. The holistic design concept - the necessity, when designing building to consider both architectural design and mechanical engineering as a whole concept rather than separate components.

CONTENTS

The seismic problem
The shape of the Earth
What is an Earthquake
Earthquake Engineering Purposes
The evolution of the earthquake resistant concepts
Building plans made of reinforced concrete
Structures subjected to horizontal forces
Orthogonal mesh frame surface
Compound Systems resistant to lateral actions
Flexural ductility of the elements of reinforced concrete
Basic types of structural configuration of buildings.
Seismic isolation and dissipative systems (basic principles)
Plans of base isolated buildings
The "Performance Based Seismic Design" (outline)
Introduction to the project of buildings isolated at the base

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ASSESSMENT

Written exam: multiple choice and open questions

RECOMMENDED TEXTBOOKS

Mandatory reading for exam preparation

The following books are required reading and include information given in the first lessons:

- ALBERTO PARDUCCI, *Fondamenti di Ingegneria Sismica in 80 lezioni*, Editore Liguori, Napoli 2011

Regulations:

- NUOVE NORME PER LE COSTRUZIONI, DM 14 gennaio 2008 (disponibili sul web – consultare Ministero dei Lavori Pubblici)

Recommended reading:

- ALBERTO PARDUCCI, *La sfida dell'isolamento sismico*, EDA numero speciale, 2007, Editore Il Prato Saonara (PD)
- MATTHYS LEVY, MARIO SALVADORI, *Perché la terra trema*. *Storia di terremoti e vulcani*, Strumenti Bompiani, Milano 1988
