UNIVERSITÀ DI PAVIA

Anno Accademico 2019/2020

SEISMIC RISK	
Anno immatricolazione	2018/2019
Anno offerta	2019/2020
Normativa	DM270
SSD	ICAR/09 (TECNICA DELLE COSTRUZIONI)
Dipartimento	DIPARTIMENTO DI INGEGNERIA CIVILE E ARCHITETTURA
Corso di studio	CIVIL ENGINEERING FOR MITIGATION OF RISK FROM NATURAL HAZARDS
Curriculum	Reduction of seismic risk
Anno di corso	2°
Periodo didattico	Primo Semestre (23/09/2019 - 16/10/2019)
Crediti	6
Ore	51 ore di attività frontale
Lingua insegnamento	English
Tipo esame	SCRITTO E ORALE CONGIUNTI
Docente	BAZZURRO PAOLO FRANCESCO (titolare) - 3 CFU MARTA DA SILVA VITOR EMANUEL - 1 CFU VAMVATSIKOS DIMITRIOS - 2 CFU
Prerequisiti	Proability and Statistics knowledge
Obiettivi formativi	---
Programma e contenuti	In this first part we will move on to describe th basics of risk assessment and loss estimation for assets subject to natural events such as earthquakes, tropical cyclones. In this part we will also review the fundamentals of seismic hazard analysis and we will cover both probabilistic and deterministic approaches. Then we will deal with catastrophe risk modelling of portfolios of structures mostly for earthquakes but will briefly discuss tropical cyclones as well. The applications discussed are typical of those found in the insurance/reinsurance industry, capital markets and sovereign disaster

risk financing. Therefore, some fundamentals of insurance/reinsurance will aslo be provided. Then we will introduce the concepts of seismic risk for single structures and we will compare and contrast them with the approach for portfolio of assets. Time permitting, we will discuss the risk assessment of networks and of nuclear power plants. These cases have special aspects that are not found in the previous applications discussed during the course.
The second part will focus on the application of the portfolio seismic risk assessment theory to real case studies. In this part you will be using models already built and the emphasis will be in learning how to compute and interpret correctly their results. Finally the third and last part of the course will tackle in detail the state-of-the-art approach to assess seismic risk of single buildings for both collpase and loss estimation purposes. The techniques that you will learn here are applicable both to the design of new buildings and to the assessment of existing ones.

Metodi didattici	---
Testi di riferimento	- Ang, A.H. and Tang, W.H. (2007). "Probability Concepts in Engineering Emphasis On Applications In Civil & Environmental Engineering", Wiley. -Benjamin, J.R. and C.A. Cornell (1970). Probability, Statistics, and Decision for Civil Engineers. New York, McGraw-Hill. -Kutner M.H., Nachtsheim C. and Neter J., 2004. Applied Linear regression models, McGraw-Hill, 1396 p. -Ross, S.M. (2004). Introduction to Probability and Statistics for Engineers and Scientists. Amsterdam, Elsevier Academic Press. -Gordon Woo: 'The Mathematics of Natural Catastrophes' (ISBN-13: 978-1860941825) and 'Calculating Catastrophe' (ISBN-13: 978-1848167391) published by Imperial College Press -Grossi, P. and Kenreuther, H. Editors (2005) "Catastrophe Modeling: A New Approach to Managing Risk" Huebner International Series on Risk, Insurance and Economic Security (ISBN-13: 978-0387241050)
Modalità verifica apprendimento	-Portfolio Earthquake Loss Estimation Assignment: 25% -Single Building Risk Assessment and Loss Estimation Assignment: 25% -Final written exam: 50%
Altre informazioni	---
Obiettivi Agenda 2030 per lo sviluppo sostenibile	$lbl_legenda_sviluppo_sostenibile