

Insegnamento: DESIGN AND RETROFIT OF RC CONSTRUCTIONS	
CFU: 9	SSD: ICAR/09
Ore di lezione: 54	Ore di esercitazione: 27
LAUREA MAGISTRALE IN INGEGNERIA STRUTTURALE E GEOTECNICA - Anno di corso: I o II	
Obiettivi formativi: This course strives to provide an insight into performance-based assessment and retrofit. Focusing on existing RC buildings, the course offers a preliminary introduction into safety-checking as a first essential step towards retrofit and retrofit design. One of the objectives of the course is to train specialized engineers who are familiar with the application of non-linear time-history analyses for assessment and retrofit purposes. Hence, time and space is dedicated to issues such as the choice of appropriate analysis procedures and record selection. Special attention is dedicated into relating the structural response at local level (i.e., shear, moment, rotation) to global engineering parameters and the definition of the ultimate limit states of near collapse and collapse. The course has an application-oriented nature and the lectures are coupled with exercise sessions. One of the formative objectives of the course is learning to model RC buildings with software Opensees.	
Contenuti: <i>Materials and structural safety. Ductility of materials, sections, elements and structures. Seismic behavior of frames, walls-frame, simple walls, coupled walls. Eurocode's design load combinations for the ultimate and serviceability limit states, calculating gravity loads. q-factor structural analyses. Checks against bending, shear and normal forces. Hierarchy of resistances. Applications of the shear/bending and columns/beams hierarchies. Verification of the nodes in concrete frames. Design vs retrofit procedure, assessment of existing buildings, performance-based earthquake engineering. Knowledge levels, inspections and tests. Finite element modelling considering nonlinear behaviour. Pushover analysis. Technical regulations in seismic areas. Applications to buildings in seismic zones.</i>	
Docente: HOSSIN EBRAHIMIAN, PAOLO RICCI	
Codice:	Semestre: I
Prerequisiti / Propedeuticità: Nessuna	
Metodo didattico: Lectures, Exercises	
Materiale didattico : <ul style="list-style-type: none"> • Fardis, M.N., 2009. Seismic design, assessment and retrofitting of concrete buildings: based on EN-Eurocode 8 (Vol. 8). Springer Science & Business Media. • Moehle, J., 2014. Seismic Design of Reinforced Concrete Buildings. McGraw Hill Professional. • Cosenza, E., Manfredi, G. and Pecce, M., 2008. Strutture in cemento armato. Le basi della progettazione. • Normativa Tecnica: Norme Tecniche per le Costruzioni (D.M. 14/01/08); • EN, Eurocode 8: Design of structures for earthquake resistance, 2005. • ASCE/SEI Seismic Rehabilitation Standards Committee, 2007. Seismic Rehabilitation of Existing Buildings (ASCE/SEI 41-06). American Society of Civil Engineers, Reston, VA. • FEMA. Techniques for seismic rehabilitation of existing buildings. FEMA-547, Federal Emergency Management Agency, 2006. • ACI Committee, American Concrete Institute and International Organization for Standardization, 2008. Building code requirements for structural concrete (ACI 318-08) and commentary. American Concrete Institute. 	
Modalità di esame: Discussion of the project and an oral exam on course contents	