



FUNDAMENTALS OF SEISMIC DESIGN

Anno immatricolazione	2021/2022
Anno offerta	2021/2022
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	1°
Periodo didattico	Secondo Semestre (07/03/2022 - 29/03/2022)
Crediti	6
Ore	51 ore di attività frontale
Lingua insegnamento	English
Tipo esame	SCRITTO E ORALE CONGIUNTI
Docente	CARVALHO MONTEIRO RICARDO NUNO (titolare) - 5 CFU GABBIANELLI GIAMMARIA - 1 CFU
Prerequisiti	- Structural Dynamics - Design of RC structures - Structural Analysis
Obiettivi formativi	
Programma e contenuti	The course will start with a brief review on the main aspects of the dynamic behaviour of linear and nonlinear single-degree-of-freedom systems, which represents the basis to understand seismic design. Afterwards, the conceptual seismic design of structures will be addressed. The core of the course will be the discussion of (largely enforced) force-based and (developing) displacement-based seismic design philosophies, focusing on the tools and steps required for their employment and verification. Capacity design principles, necessary to

	ensure a target hierarchy of ductile inelastic deformations will be explained with emphasis on the design and detailing of reinforced concrete structures with the adoption of Eurocode 8, amongst other codes and guidelines. Further attention will also be paid to the characterisation of the force-deformation behaviour of reinforced concrete structural elements as well as the modelling and analysis of reinforced concrete structures with nonlinear finite element approaches.
Metodi didattici	Four homework assignments are foreseen, which will address the characterization of the seismic input and the seismic design and detailing of a reinforced concrete structural wall building, in addition to a small project, to be carried out in groups.
Testi di riferimento	[STRUCTURAL DYNAMICS] • Chopra A., "Dynamics of Structures", Prentice Hall, Third Edition, 2007 • Clough R.W., Penzien J., "Dynamics of structures", Computers & Structures Inc, 2003 [SEISMIC BEHAVIOUR AND DESIGN] • Priestley, M.J.N., "Myths and Fallacies in Earthquake Engineering, Revisited", Rose School, Pavia, 2003 • Paulay, T. and Priestley, M.J.N., "Seismic Design of Reinforced Concrete and Masonry Buildings", Wiley, 1992 • Priestley, M.J.N., Calvi G.M. and Kowalsky, M.J., "Displacement-Based Seismic Design of Structures", IUSS Press, 2007
Modalità verifica apprendimento	Homework assignments: 30% (7.5% each) Project: 20% Final exam: 50%
Altre informazioni	
Obiettivi Agenda 2030 per lo sviluppo sostenibile	\$lbl_legenda_sviluppo_sostenibile