

Course: Structural Dynamics and Seismic Engineering		Teaching Language: Italian
SSD (Subject Areas): CEAR-07/A		CREDITS: 9
Course year: I	Type of Educational Activity: B	
Teaching Methods: in-person		
Contents extracted from the SSD declaratory consistent with the training objectives of the course: The objective of the course is to enable students to model the phenomena governing structural dynamics and to apply these models to analyze structural behavior under seismic actions. The course covers the dynamics elastic-linear and elastoplastic single degree of freedom systems, then moves on to systems with concentrated masses, and finally provides an introduction to the dynamics of systems with distributed masses and the propagation of mechanical waves. A wide range of cases involving free and forced oscillations is covered. With regard to earthquake engineering, the course begins with the fundamentals of seismic engineering and probabilistic seismic hazard analysis, which forms the basis for defining seismic actions in structural design. Hazard curves, design spectra, and the disaggregation of seismic hazard are covered. Structural dynamics and seismic engineering converge in the discussion of the performance-based approach to seismic design, in the relationship between elastic and inelastic seismic demand, in methods of linear static and modal analysis, and finally in the integration of equations of motion. During the course, students will apply what they have learned through practical exercises in: (1) seismic signal analysis; (2) calculation of hazard curves and design spectra; (3) linear static and modal structural analysis for frames and bridges.		
Objectives: To provide the fundamentals of the structural dynamics of linear systems with concentrated and distributed masses. To provide the fundamentals of earthquake engineering and expertise in probabilistic seismic hazard analysis. To provide the principles of contemporary seismic design of structures. To familiarize students with the practical application of structural analysis under seismic loads.		
Propaedeutcities: none Is a propaedeuticity for: none		
Types of examinations and other tests: Midterm, written and oral exams		